MODELS, METAPHORS & SIMULATIONS

EPISTEMIC TRANSFORMATIONS IN LITERATURE, SCIENCE AND THE ARTS

SLSAeu Conference

May, 18-21/2023

SLSAEU EUROPEAN SOCIETY
FOR LITERATURE, SCIENCE AND THE ARTS

ELINAS RESEARCH CENTER
FOR LITERATURE AND NATURAL SCIENCE

Thursday, May 18 / 2023

9:00-9:30 – Room: Orangerie, Wassersaal

Opening Session: Aura Heydenreich, Klaus Mecke

9:30 – 10:30 Key-Note: Roman Frigg (Philosophy of Science, London School of Economics and Political Science): *Red Squares and Bouncing Balls - From Art to Science and Back Again*

10:30 – 10:45 Coffee break (Orangerie, Foyer)

10:45-12:15 Chair: Aura Heydenreich Room: Orangerie

Michael Friedman (History and Philosophy of Science, University of Tel Aviv)
Karin Krauthausen (Literature and Cultural Studies, Humboldt University, Berlin): *Model and Mathematics at the End of the 19th Century: between Materiality and Representation* **–> Stream A**

Michael Herrmann (Philosophy of Computational Sciences, Universität Stuttgart): *Making Sense of Methodological Disagreement within Machine Learning* **–> Stream B**

Liliane Campos (English Studies, Université Sorbonne Nouvelle) : *Microcosms as Models and Metaphors in Contemporary Eco-Fiction* **–> Stream C**

12:15 – 12:45 Art & Science Exhibition / Presentation

Chair: Klaus Mecke Room: Orangerie

Thomas Asmuth (Digital & New Media Art, University of West Florida) and Sara Gevurtz (**Animation, Auburn University**): *Turbidity Paintings*

---

12 :45 – 14 :00 Lunch break

14:00-15:30 Chair: Karin Höpker Room: Orangerie

14:00 – 15:00 *Key-Note: Winfried Menninghaus (Max Planck Institute for Empirical Aesthetics, Frankfurt a. M.): More order and more chaos combined: Poetic diction and its effects on cognitive and aesthetic processing*

15:00 – 15.30 David Hommen (Philosophy, Heinrich-Heine-University, Düsseldorf): *Models, Metaphors, Metaphysics – A Wittgensteinian Approach to Knowledge in Art, Philosophy, and Science*

15:30 – 16:00 Coffee break (Orangerie, Foyer)

16:00-18:00 STREAM A Epistemology and Aesthetics: Materiality and Models

Chair: David Hommen Room: Orangerie

Danka Radjenović (Philosophy, University of Kaiserslautern-Landau): *(How) Do Models Exemplify? Some Thoughts on Wet Lab Models in the Life Sciences*

Jasmin Trächtler (Philosophy, Technical University Dortmund) *The Problem of Negation in Visual Models*

Mariano Martín Villuendas (Philosophy, University of Salamanca): *Conceptualizing a Pragmatist Artifactualism*

Lorenzo Sartori (Philosophy of Science, London School of Economics and Political Science): *Model Organisms as Representations*

16:00-18:00 STREAM B Brains and Computers: Digitization and Simulations

Chair: Sebastian Lemerle Room: Kollegienhaus 1.011 (Senatssaal)

Nicole Brandstetter (English Studies, University of Applied Sciences Munich): *Simulation, Duplication and the Moebius Strip - LiteraryThought Experiments on Disengagement of Space, Time and Identity in Times of Digitalisation and AI*

Naomi Mandel (American Studies, Hebrew University, Jerusalem): *Hacking as Literary and Technological Reciprocity*

Iman Ferestade (Mechanical Engineering, Simon Fraser University Burnaby, Canada): *An Engineering-Inspired Account of Knowledge (Computer simulations)*

Liam Mullally (Cultural studies, University of London): *Reading JPEG: The JPEG-1 Specification as a Key Text in the Production of Digital Photographic Images?*

16:00-18:00 STREAM C Environment and Society: Ecosystems

Chair: Liliane Campos Room: Kollegienhaus 1.020

Matthew Eisler (History, University of Strathclyde, Glasgow): *Green Discourse, the Energy/Materials Ecosystem, and Technologies of Environmental Care*

Konrad Kopel: (History and Cultural Theory, University of Silesia, Katowice): *Models of worlding. An analysis of the first Polish Handbook of Modern Forestry as a Vehicle for Environmentality*

Teun Joshua Brandt (Literary Studies, University of Groningen): *The Holobiontic Figure: Cultural Complexities of Holobiosis in Joan Slonczewski's Brain Plague*

18:00 Art & Science Exhibition / Presentation

Chair: Christine McWebb Room: Orangerie

Szilvia Ruszev (Media and Communication, Bornemouth University):

Neuro-Avantgarde

Friday, May 19 / 2023

9:00-10:30 ELINAS-PANEL

Chair: Dirk Vanderbeke Room: Orangerie

Jay Labinger (Chemistry, California Institute of Technology) - Is the Importance of Metaphor, Models and Simulations in Science Best Exemplified by Chemistry?

Klaus Mecke (Physics, University Erlangen-Nürnberg): Narratives of Measurements, Models, and Events: How does Physics Work as an Empirical Science?

Aura Heydenreich (German and Comparative Studies, University Erlangen-Nürnberg): *The Epistemic Functions of Interformation in Science and Literature: Einstein's Relativity Theory as a Case Study*

10:30 – 11:00 Uhr Coffee break (Foyer Orangerie)

11:00-13:00 ELINAS-PANEL

Chair: Dirk Vanderbeke Room: Orangerie

Sarah Goeth (German Literature, Innsbruck University): *Analogy - A Figure of Mediation between Science and Art*

Leonhard Möckl (Max Planck Institute for the Science of Light, Erlangen): *On the Logical Position of the Hypothesis*

Peter Hull (English Studies, University of Erlangen-Nürnberg; Max Planck Institute for the Science of Light): Liberating energy. Investigating Physicists' Use of Anthropomorphic Cognitive Metaphors when Modeling Matter-Energy Interactions in English and German

11:00-13:00 STREAM A Epistemology and Aesthetics: Aesthetics and Science

Chair: Michael Friedman Room: Kollegienhaus 1.011 (Senatssaal)

Christine McWebb (French Studies, University of Waterloo): *Medieval Alchemy as Metaphoric Modelling for Polysemy in Jean de Meun's "Roman de la Rose"*

Jessica Stacey (Romance Studies, Freie Universität Berlin): *"Illusory chemistry": Analysis and Synthesis as Contested Models for Philosophical Thought in Eighteenth-Century France*

Emma de Beus: (English Literature, Queen's University Belfast*) Physics as Paradigm: Light in Literary Adaptation as Seen in „Hamlet"*

Ben Toth (Philosophy of Science, University of Lisbon): *A Common Model for Fictional and Scientific Narratives*

11:00-13:00 STREAM B Brains and Computers: Digital Humanities

Chair: Michael Herrmann Room: Kollegienhaus 1.020

Carolina Ferrer (Département d'études littéraires, Université du Québec à Montréal): *From Scientometrics to Criticometrics. Elaborating a Systemic Approach for Studying Literature through Metadata*

Rozalia Slodcyk (Philosophy, Independent Scholar, Warsaw, Poland) - *Models and Diagrams in Literary Research - Close Reading versus Distant Reading in Digital Humanities on the Example of Ekphrasis and Nocturne*

Daniel Raschke *(Literature, Media, Culture, Florida State University): Denoising Futurisms: Modeling Algorithmic Avant-Gardes*

Stefano Franceschini (American Literature, Roma Tre University): *"I had found my model of replication": Analogy and Musical Signification in Richard Powers's "The Gold Bug Variations"*

13:00 – 14:00 Lunch break

14:00-15:00 Chair: Klaus Mecke Room: Orangerie

Keynote: Amy Kind (Philosophy, Claremont McKenna College, California): *Accuracy in Imagining*

15:00 – 15:30 Robert Clewis (Philosophy, Gwynedd Mercy University, Pennsylvania): *Imagine that, Kant: Crossdisciplinary work on Awe and the Sublime*

15:30 – 16:00 Uhr Coffee break (Foyer Orangerie)

16:00-18:00 Panel - Literary Modelling and Energy Transition

Chair: Klaus Mecke Room: Orangerie

Veit Hagenmeyer (Energy Informatics, Karlsruhe Institute of Technology): *Modelling the Energy Lab 2.0*

Tobias Becker (Design and Design Theory, University of Siegen): *The Blind Spots of Modelling: Models in Arts and Science*

Eric Achermann (Early Modern Literature, History of Knowledge, University of Münster) *Models and Metaphors: A Topological Turn*

Robert Matthias Erdbeer (Modern German Literature, University of Münster) *Literary Modelling and Energy Transition. A Transdisciplinary Venture'*

Friday, May 19 / 2023

16:00-18:00 STREAM B Brains and Computers: Consciousness

Chair: Nicole Brandstetter Room: Kollegienhaus 1.011 (Senatssaal)

Sébastien Lemerle (Sociology, Université Paris-Nanterre): *Biological Phenomena in Search of a Meaning: The Concept of Brain Plasticity as a Back-and-Forth Between Biology, Politics and Culture*

Katharina Trettenbach (Ethics of Medicine, Tübingen University) / Joachim Peters (German Linguistics, University Erlangen-Nürnberg): *Of Brains in a Dish and Mini-Brains - Cerebral Organoids, Scientific Models and the Ethical Implications of Metaphors*

Dror, Otniel E. (Medical Anthropology, Hebrew University of Jerusalem): *The Insatiable Rat*

16:00-18:00 STREAM C Environment and Society: Evolution and Probability

Chair: Robert Clewis Room: Kollegienhaus 1.020

Johannes Müller (German Studies, Leiden University): *Adaptive Landscapes as Metaphors and Models*

Lilian Kroth (French Literature, University of Cambridge): *Modelling and Imagining 'Tipping Points'*

Ken Archer (Philosophy, AI Ethics at Twitch): *Probability and the Analogical Participation of Models in Intersubjective Goods*

Joshua Wodak (Environmental Humanities, Western Sydney University): Probing the Vicissitudes of the Cosmos: The Limits of Knowability in Literary and Scientific Worldviews

---

18:00 Art & Science Exhibition / Presentation

Chair: Hannah Star Rogers Room: Orangerie

Piera Benetti (Verona, Italy): *Interwined vision*

19:00 Conference dinner: Ristorante Parmigiano, Paulistraße 12, Erlangen

Saturday, May 20 / 2023

9:00-10:30 Chair: Aura Heydenreich Room: Kollegienhaus 1.011 (Senatssaal)

9:00 – 10:00 Key-Note Jens Eder (Narrative and Aesthetics of Audiovisual Media at Film University Babelsberg, Potsdam): *Using Models in Narrative Practice: From Characters to Social Impact*

10:00 – 10:30 Tudor Baetu (Philosophy, Québec University): *Animal Models of Consciousness*

10:30 – 11:00 Coffee break (Kollegienhaus, Room 0.024)

11:00-12:30 PANEL: Literature and the Public Sphere

Chair: Antonia Villinger Room: Kollegienhaus 1.011 (Senatssaal)

Antje Kley (American Studies, University Erlangen-Nürnberg): *Where Reason Fails: Literary Epistemologies of Death in the 21st Century*

Karin Höpker (American Studies, University Erlangen-Nürnberg): *Future Responsibilities and Affordances: Class, Catastrophe, and Ownership in Science Fiction*

Arunima Kundu (American Studies, University Erlangen-Nürnberg): *Mediating Blackness. The Afrofuturist Planetary Posthuman in Black Panther*

11:00-12:30 STREAM A Epistemology and Aesthetics: Scientific Representation

Chair: Karin Krauthausen Room: Kollegienhaus 1.019

Onerva Kiianlinna (Aesthetics, University of Helsinki): *Simulationalist versus Embodied Approaches in Aesthetics*

Gabrielle Reid (German Literature, Yale University): *Schelling on Simulation and the Construction of Reality*

Rosa Coppola (German Literature, Alexander von Humboldt-Stiftung, LMU Munich): *Artificial Models of Involuntariness. Max Bense's Cybernetic Poetry as Epistemic Creation of Futures?*

11:00-12:30 STREAM B Brains and Computers: Biomedicine

Chair: Tudor Baetu Room: Kollegienhaus 1.020

Desiree Foerster (Media and Culture Studies, Utrecht University*): New Phenomenologies of Pain and Disease through Experimentations with Digital Technologies in the Arts*

Sofia Varino (Cultural Studies, University of Potsdam): *The Logic of Prevention: Anticipatory Narratives, Concepts, Models and Metaphors in Covid-19 Biomedical Imaginaries*

Mohsen Forghani (Philosophy, University of Warsaw): *Force-Dynamic Structure: Cases of Theories of Humor and Hysteria*

12:30 – 14:00 Lunch-break

14:00-15:30 PANEL: Literature and the Public Sphere

Chair: Karin Höpker Room: Kollegienhaus 1.011 (Senatssaal)

Ruxandra Teodorescu (American Studies, University Erlangen-Nürnberg): *Beyond Binary – AI, SF, and the Moral Imagination*

Antonia Villinger (German Literature, University Erlangen-Nürnberg): *Post-Petro Imaginary and Utopian Social Enclave in Theresia Enzenberger's "Auf See"* (2022)

Elisabeth Reichel (American Studies, Osnabrück University): *Modeling Libertarian Collectives*

Saturday, May 20 / 2023

14:00-15:30 STREAM A Epistemology and Aesthetics: Metaphor and Analogy

Chair: Peter Hull Room: Kollegienhaus 1.019

Addison Neil (British Literature, Japan Women's University, Tokio): *Industrial Metaphor Transformed in Charles Dickens's "Dombey and Son" (1848) and "The Signal-Man" (1866).*

Su Min Kim (College of Liberal Studies, Seoul National University): *The Political Calculator in Jules Verne's „Lunar Stories"*

Katja Schmieder (American Studies, University of Leipzig): *Dust as Metaphor and Model in Philip Pullman's "His Dark Materials"*

14:00-15:30 STREAM B Brains and Computers: Neural Nets, Machine Learning, AI

Chair: Daniel Raschke Room: Kollegienhaus 1.020

Lucas Bang (Computer Science, Harvey Mudd College, California): *Abstractionism and Simulation in Software Development*

Koray Karaca (Philosophy, University of Twente): *Representational Requirements on Explainable Machine Learning Models*

Maximilian Noichl (Philosophy, University of Vienna / University of Bamberg): *How Localized are Computational Templates? A Machine Learning Approach*

15:30 – 16:00 Uhr Coffee break (Kollegienhaus, Room 0.024)

16:00-17:30 STREAM A: Epistemology and Aesthetics: *Metaphor and Analogy*

Chair: Sarah Goeth *Room: Kollegienhaus* 1.011 (Senatssaal)

Marie Teich (Max-Planck-Institut für Mathematik in den Naturwissenschaften, Leipzig): A Metaphor Theory based on Etymological Network Structure Analysis

Lee Siyeon (English Studies, Gwangju Institute of Science and Technology, Republic of Korea): *Through the Looking-Glass, and What Women Found There. Conway, Cavendish, and Specular Metaphors of Self-Knowledge for Early Modern Women*

17:30 – 19:00 Uhr ONLINE SESSION

Chair: Sarah Goeth Room: Kollegienhaus 1.011 (Senatssaal)

Olga Timurgalieva (Creative Media, City University of Hong Kong): *Yeast metaphors beyond machines*

Aditya Jha (Mathematics, Philosophy, University of Canterbury): *Modelling Temperature as a Continuous Function: Lessons from Thermal Physics*

Anand Abhinav (English Literature, Indian Institute of Technology, Kanpur, India) - *"Literature" of Science: Reading Science as an Institutionalised System of Knowledge in Contemporary Indian Fiction*

16:00-17:30 STREAM B: Brains and Computers: Posthuman Visions

Chair: Naomi Mandel Room: Kollegienhaus 1.019

Simona Bartolotta (English Literature, University of Oxford): *Thought Experiments, Literary Narrative, and Science Fiction: The Example of Isaac Asimov's Robot Cycle*

Terence Shih (English Studies, St. John's University, Taiwan): *Queering Romantic AI: The Shelleyan Wandering Jew in Asimov's Bicentennial Man*

Rachel Tay (Literary Studies, Duke University): *Next to Human: Proximity and/as Measure of (Post)Humanity*

16:00-17:30 STREAM C Environment and Society: Science and Literature

Chair: Valentin Weber Room: Kollegienhaus 1.020

Christian Thomé (Classical Philology, University of Wuppertal): *Spherical Geometry in Euclid's „Phaenomena"*

Laetitia Rimpau (German Literature, University of Wuppertal): *Scientific Knowledge as Ascent to the Light. On the Literary Method of Dante Alighieri and Johannes Kepler*

George Vlahakis (Physics and History of Science, Hellenic Open University, Athens): *Patterns of Science in 19th Century Greek literature*

19:00 – 19:30 Uhr SLSAeu Members Meeting 1.011 (Senatssaal)

Sunday, May 21 / 2023

9:00-11:30 Chair: Jay Labinger Room: Kollegienhaus 1.011 (Senatssaal)

Dirk Vanderbeke (English Studies, Schiller Universität Jena): *On the Coincidence of Change in Science and Culture*

Stephan Besser (Literary Studies, University of Amsterdam): *Conjuring a Sense of Order: Pattern as a Figure of Knowledge in Armin Nassehi's Theory of Digital Society*

Dominik Baumgartner (Theology, LMU München): *Theology between Models and Metaphors. A model-based scientific theology facing biblical narratives and personal belief*

Roland Bolz (Philosophy, Humboldt University Berlin): *Functional Similarities and Differences Between Analogical Thought in Literature and Science*

Hannah Star Rogers (Science and Technology Studies, University of Copenhagen): *The Politics of Knowledge: Art, Science, and Technology Studies*

11:30 - *Concluding Session*

Aura Heydenreich, Klaus Mecke

KEYNOTE SPEAKERS

JENS EDER

Jens Eder is Professor of Narrative and Aesthetics of Audiovisual Media at Film University Babelsberg KONRAD WOLF in Potsdam, Germany's largest film school and only university specialising in film. Eder's research focuses on intersections between narration, aesthetics, affect, societal contexts, and current developments of audiovisual media. Together with Britta Hartmann and Chris Tedjasukmana, he is PI of the research project Attention Strategies of Videoactivism on Social Media, funded by the Volkswagen Foundation. His recent work deals with the social impact of films; cinematic aesthetics, empathy, and perspective; and the analysis of characters and their forms and functions. Some of his publications are available in English, such as Characters in Fictional Worlds: Understanding Imaginary Beings in Literature, Film, and Other Media (co-edited with Fotis Jannidis and Ralf Schneider, de Gruyter 2010); Image Operations. Visual Media and Political Conflict (co-edited with Charlotte Klonk, Manchester University Press 2017) and the issue #Emotions of NECSUS (co-edited with Julian Hanich and Jane Stadler, 2019). Two books are in preparation: Characters in Film and Other Media. Theory, Analysis, Interpretation (Open Book Publishers 2023) and Video-Activism on Social Media (with Britta Hartmann and Chris Tedjasukmana, Intellect 2024).

AMY KIND

Amy Kind, the Russell K. Pitzer Professor of Philosophy, joined the CMC faculty in 1997. Currently the Director of the Gould Center for Humanistic Studies, she has previously served as Chair of the Department of Philosophy (2009–2012) and Associate Dean of the Faculty (2005–2008). At CMC, she teaches classes in philosophy of mind, metaphysics, and logic. Her research interests lie broadly in the philosophy of mind, though most of her published work has concerned issues relating either to imagination or to phenomenal consciousness. Her monograph in the Cambridge Elements in Philosophy of Mind series, Imagination and Creative Thinking, was published in 2022. She has edited or co-edited four volumes: Episte-mic Uses of Imagination (co-edited with Christopher Badura), Knowledge Through Imagination (co-edited with Peter Kung), The Routledge Handbook of Philoso-phy of Imagination, and Philosophy of Mind in the Twentieth and Twenty-First Centuries. She has also written introductory textbooks on Persons and Personal Identity (Polity Press) and Philosophy of Mind: The Basics (Routledge).

KEYNOTE SPEAKERS

ROMAN FRIGG

Roman Frigg is a philosopher of science. His research interests lie in general philosophy of science and philosophy of physics, and he has published papers on scientific representation, modelling, statistical mechanics, randomness, chaos, climate change, quantum mechanics, complexity, probability, scientific realism, computer simulations, reductionism, confirmation, and the relation between art and science. His current work focuses on the nature of scientific models and theories, the foundations of statistical mechanics, and decision making under uncertainty.

WINNFRIED MENNINGHAUS

Winfried Menninghaus has researched and taught as a professor of general and comparative literature at the Freie Universität Berlin and at the universities of Yale, Princeton, Berkeley and Jerusalem. From 2013 to 2022 he was director of the department „Language and Literature“ at the Max Planck Institute for Empirical Aesthetics in Frankfurt. He has written books on fundamental aesthetic issues and on a variety of literary authors from the 18th century to the present day. In his empirical studies, too, he has examined in particular the special characteristics as well as the cognitive, emotional and aesthetic implications and effects of poetic and rhetorical language use.

KEYNOTE SPEAKERS

JEAN-MARIE SCHAEFFER

Professor **Jean-Marie Schaeffer** teaches philosophy and philosophical aesthetics at the EHESS (Paris). His fields of studies are philosophical anthropology, philosophical aesthetics, arts and literary aesthetics. He has been Vice-President for Research at the EHESS and is acting as an member for French (ANR, IUF, IEA Lyon, IEA Strasbourg) and International (FU Berlin, FNRS, NRCC, ...)

Kollegienhaus: Universitätsstraße 15, 91054 Erlangen

Orangerie: Schlossgarten 1, 91054 Erlangen

Friday, 19th May, 19:00: Conference dinner:
Ristorante Parmigiano (Paulistraße 12, Erlangen)

Red Squares and Bouncing Balls – from Art to Science and Back Again

This lecture explores the relation between representation in art and science, and it argues that these have more in common than we might think. This thesis is developed within the framework of the DEKI account of representation, which sees representation as constituted by the interplay of four components: denotation, exemplification, keying-up and imputation. This account allows us to pinpoint both what representation in art and science share, and what separates them.

Roman Frigg

Philosophy of Science, London School of Economics and Political Science

Roman Frigg is a philosopher of science. His research interests lie in general philosophy of science and philosophy of physics, and he has published papers on scientific representation, modelling, statistical mechanics, randomness, chaos, climate change, quantum mechanics, complexity, probability, scientific realism, computer simulations, reductionism, confirmation, and the relation between art and science. His current work focuses on the nature of scientific models and theories, the foundations of statistical mechanics, and decision making under uncertainty.

Model and Mathematics at the End of the 19th Century: between Materiality and Representation

How was modeling done during the second half of the 19th century discussed in pure mathematics and mathematical physics? When considering the discourse on models, analogy and similarity starting from the middle of the 19th century, we claim that the concept of the mathematical "model" was oscillating between two poles: between on the one hand material concretization, as an attempt to represent the mathematical object itself (such as curves or surfaces), and on the other hand abstraction, as what does not aim any more towards a technical representation and does not necessarily have a relation to the real world. It is this oscillation – which can be seen with James Clerk Maxwell's discoveries as well as Felix Klein's mathematical models – which we aim to examine in our talk.

Within the field of mathematical physics, the act of modeling was not disconnected from the field of pure mathematics. Maxwell insistence of finding a "geometrical model of the physical phenomena"1 is well known; Moreover, in 1861 he stated that the "mathematical analogies of two [given] problems [...] assist the imagination in the study of both"2 . What was the role of modeling for Maxwell? Is it "simplification and reduction" of the physical phenomenon, or rather the usage of analogies between different physical phenomena? Or perhaps examining the material models in themselves, as instruments for further calculations, such as his 1874 clay model of the thermodynamic surface?

The construction of Maxwell's material model should be connected to the more general rise of the construction of material models of mathematical objects (from plaster, wood or strings), since such models were popular among numerous mathematicians in the late 19th century Germany and England, and were used not only for means of education but also for prompting new research questions. How the act of modeling oscillates between abstraction and concretization, between representing the known and prompting the new, is to be seen also in pure mathematics; Felix Klein and Alexander Brill were among the driving forces of the construction and acquisition of models during the last quarter of the 19th century. Brill explicitly claimed that the models serve not only as a means for the visualization of computations but also as what can initiate new knowledge.3 Klein insisted that material models were not a means to an end and situated them against the purism of abstraction. We hence aim to show that during the second half of the 19th century, the role of model and modeling was never an act of a second order representation, but rather a material epistemological operation, which eventually led to a growing abstraction within mathematics itself.

1 Maxwell, James C. (1856), "On Faraday's Lines of Force", in: Transactions Cambridge Phil. Soc., vol. 10, pp. 155–229, here: p. 158.
2 Maxwell, James C. (1861), "On Physical Lines of Force, part I: The Theory of Molecular Vortices applied to Magnetic Phenomena", in: Philosophical Magazine, vol. 21, series 4, pp. 161–175, here: p. 163.
3 Brill, Alexander (1887), "Über die Modellsammlung des mathematischen Seminars der Universität Tübingen (Vortrag vom 7. November 1886)", in: Mathematisch-naturwissenschaftliche Mitteilungen, vol. 2, pp. 69–80, see e.g. p. 77.

Michael Friedman
Cohn Institute for History and Philosophy of Science and Ideas, Tel Aviv

Karin Krauthausen
Literature and Cultural Studies, HU Berlin

Michael Friedman is a historian of mathematics and a Senior Lecturer at the Cohn Institute. Before joining the Cohn Institute he held post doc positions at the Humboldt-Universität zu Berlin, Institute Fourier in Grenoble and Max Planck Institute for Mathematics in Bonn. He is currently working on the diverse traditions of mathematics of the 19th, 20th and 21st centuries, looking into the material practices of mathematics (folding, weaving, braiding, knotting, as well as 3D models), artisanal epistemology, and how symbolical-mathematical knowledge was prompted by such artisanal and material practices. Recent Publications: Model and Mathematics: From the 19th to the 21st Century (ed. with K. Krauthausen, Cham: Birkhäuser, 2022), Ramified Surfaces. On Branch Curves and Algebraic Geometry Abstracts SLSAeu '23 in the 20th Century (monography, Cham: Birkhäuser, 2022), Grenzen der Formalisierung. Von Leibniz bis Lacan (monography, with A. Seppi; Leipzig: Spector Books, 2021).

Karin Krauthausen is a literary and cultural scholar with a focus on epistemological questions. After completing her doctorate on the Cahiers of Paul Valéry, she was a fellow at the Max Planck Institute for the History of Science in Berlin before moving to the Cluster of Excellence "Image Knowledge Gestaltung" at Humboldt-Universität zu Berlin. There she did research in model theory as well as in the history of structuralism and a new 'science of structures' and together with P. Fratzl, M. Friedman and W. Schäffner, she headed the priority area "Active Matter". Since 2019 she is a postdoctoral research associate in the Cluster of Excellence "Matters of Activity" at Humboldt-Universität zu Berlin. Her research interests include the practices of knowledge production as well as the restless constellations between arts and sciences (18th–21st century with a special focus on European literature). Recent publications: Model and Mathematics: From the 19th to the 21st Century (ed. with M. Friedman, Cham: Birkhäuser, 2022), Modell Hütte (edited with R. Ladewig, Zürich: Diaphanes, 2021), Active Materials (edited with P. Fratzl, M. Friedman, W. Schäffner, Berlin and Boston: De Gruyter, 2021), Make it real. Für einen strukturalen Realismus (ed. with S. Kammer, Zürich 2020: Diaphanes)

Methodological Disagreement between Statistics and Machine Learning – a case for a Kuhnian paradigm shift?

The observation from Leo Breiman (2001) that there are two cultures of data modeling, namely statistical modeling and prediction-focused algorithmic modeling can be applied to shed light on the differences between modern statistics and machine learning.

I try to elaborate further on this idea by discussing the claim that there is a Kuhnian paradigm shift in science from statistics to machine learning.

To be adequate to the Kuhnian framework (paradigm, normal science & anomalies, crisis & revolution) from philosophy of science, I will consider the following three issues: What are the (i) anomalies in modern Statistics? (ii) competing new (pre-)paradigms arising from the crisis with different communities using different languages? (iii) paradigmatic viewpoints, standards and goals in ML?

Michael Herrmann

Philosophy of Computational Sciences, University Stuttgart

Michael Herrmann is a doctoral candidate in the department Philosophy of Computational Sciences at the High Performance Computing Center (HLRS) at Stuttgart university. Currently he is involved in the research project „Vertrauen in Informationen - Bewertungsstrategien der Glaubwürdigkeit computerbasierter Methoden und Resultate“ at the HLRS.
He is also the head of the Tübingen Forum for Science and Humanities at Tübingen university. He graduated in mathematics and philosophy. In his PhD, he is studying the intimate relationship between mathematics as a tool and technology within computer simulations and machine learning methods and considers the consequences for balancing the influence of epistemic and non-epistemic values.

L. Breiman. Statistical modeling: The two cultures (with comments and a rejoinder by the author). Statistical science, 16(3):199-231, 2001.

Microcosms as Models and Metaphors in Contemporary Eco-fiction

Liliane Campos

Département du monde anglophone, Université Sorbonne Nouvelle, Paris

Dr Liliane Campos is a Lecturer in English and Theatre studies at the Sorbonne Nouvelle, and a Research Fellow of the Institut Universitaire de France. Her published articles explore ways in which contemporary novelists, poets and performers transform and engage with the images and discourse of science. She has published two books on science in British theatre: The Dialogue of Art and Science in Tom Stoppard's Arcadia (2011) and Sciences en scène dans le théâtre britannique contemporain (2012), co-edited special issues of Alternatives théâtrales, Sillages Critiques and Epistémocritique, and most recently the collective volume Life, Re-Scaled: The Biological Imagination in Twenty-First-Century Literature and Performance (2022)

This paper will ask what epistemic work is performed by the topos of the microcosm in contemporary anglophone eco-fiction. I will explore recent fiction by Amitav Ghosh, Leslie Marmon Silko, A. S. Byatt and T. C. Boyle, where large-scale ecological disruption is explored through exemplary, smaller-scale environments. These spaces can be viewed as ecological microcosms, miniature ecosystems that function as models for ecological principles. They facilitate the reader's perception of planetary upheavals, and develop the kind of multi-scalar awareness that Mitchell Thomashow calls "biosphere perception". I will argue however that the figurative aspects of these microcosms – the fact that they are also tropes – troubles their work as models.

I identify three troubling figurative dimensions. The first is a certain inherited anthropomorphism, derived from a long history of microcosmic poeticss, which in Western literature has emphasized metaphorical relations between human bodies and their environments. I connect this trend in contemporary fiction to the twenty-first-century imaginary of Gaia. The second is the microcosm's reliance on what Zach Horton has theorized as "scalar collapse": as a trope, it projects one scale onto another, implying that phenomena that are perceptible at a particular scale can be understood through phenomena perceived at another scale. Scalar collapse, according to Horton, is an inherently political epistemic move, since it has the potential to subordinate one scale to another and erase difference: this erasure is typical of imperial expansion and of capitalism, which rely on scalable systems such as plantations or industrial production. If eco-fiction attempts to resist such epistemic moves, how does the microcosm assist or hinder this resistance?

The third way in which the microcosm-as-trope troubles the microcosm-as-model is by allowing discrepancies to creep in between the model and the planetary ecosystem it represents. I examine what value these discrepancies might have: whether they develop our 'scalar literacy', helping us perceive 'the way the nature of an issue or situation alters according to the scale at which it is considered' (Timothy Clark), or perhaps a less didactic, yet equally productive, sense of irony. These questions lead me to outline a more nuanced epistemic readings of fictional microcosms, and to suggest that our focus might usefully expand from their role as metaphor to their potential as synecdoche.

Turbidity Paintings

Turbidity Paintings is a series of projects created by the artists Thomas Asmuth (University of West Florida) and Sara Gevurtz (Auburn University). The pair hail from backgrounds in science, and over the past seven years, the partners have developed an expansive suite of transdisciplinary eco-projects that merge art and scientific research. Each Turbidity Paintings project uses the metaphor of co-mutualism (AKA symbiotic relationships) as a concept and form. The synergy of co-mutual systems requires the balance of provision and necessity for each partner and is critical to a healthy environment. Asmuth and Gevurtz use the term 'eco-works' rather than research or artwork because the project aspires to a conceptual symbiosis of scientific study and aesthetic product.

The project initially proposed a new visualization methodology to record images and collect data on water quality. Information gathered in the field would construct a library of time-specific images encoded with data metrics from various locations. The project experimented with using submersible remote-operated vehicles (ROVs) equipped with specialty tools for data collection and eventually evolved to using a custom dolly and camera. The artists capture images to map the turbidity or clarity of the water, creating work that exists as both scientific data and art objects.

The project has expanded to creating light and water sculptures – a collaboration of scientific and creative processes. The strategy creates methodological ecology, where the water concurrently becomes a thing of contemplation (art) and a specimen (science). The wall-mounted sculpture comprises a series of meter-long underlit columns. Light traveling through the liquid gives off minimal color, but at the cylinder tops, color emerges and is cast to the wall, the color that matches each sampling site. If the river is muddy, bronzes appear, greens show overwhelming algal growth, and aquamarine hues emerge in samples from the ocean's open water. As a kind of 'physical graphing,' the color can begin to reveal river conditions for the non-expert audience and science professional.

Thomas Asmuth

Digital & New Media Art, University of West Florida

Sara Gevurtz

Animation, Auburn University

Sara Gevurtz is an Assistant Professor of Animation at Auburn University. Gevurtz graduated from the CADRE Laboratory for New Media at San Jose State University, where she received a Master of Fine Arts in Digital Media Art. She received her bachelor's degree in Evolution, Behavior, and Ecology Biology from the University of California, San Diego. Due to her interdisciplinary background, her artistic research focuses on ecological and environmental issues. Gevurtz has published and shown work internationally and nationally, for example, at the CICA Museum in Korea and the Museum of Copper and Ancient Crafts in Italy. She also works collaboratively to develop a project using a rig and camera, to create a series of photographs that are both data and art. This project has been presented at ISEA2017 in Manizales, Columbia, Balance-Unbalance 2017 in Plymouth, UK, and ISEA2018 in Durban, South Africa.

Thomas Asmuth is a transdisciplinary artist and designer working at the intersections of art, science, and technology. Asmuth is an alumnus of the CADRE Laboratory for New Media at San José State and holds a BFA in Painting from the San Francisco Art Institute. Asmuth uses transdisciplinary approaches to affect innovation or gain new insights. Asmuth's work with marine biologists has bridged domains and connected audiences. His mixed media sculptures concomitantly exist as a database. Asmuth is a recipient of a Florida Humanities Council grant and a UWF Florida Research Fellowship. He has exhibited at Auburn University, Salisbury University, Montalvo Arts Center, 319 Scholes, the International Symposium on Electronic Art, the Laguna Art Museum, Zer01 Biennial, and the Francis Tang Teaching Museum. Asmuth teaches digital and experimental media courses at the University of West Florida Department of Art.

More order and more chaos combined: Poetic diction and its effects on cognitive and aesthetic processing

The lecture presents a theoretical two factor-rmodel of rhetorical and poetic diction. It also reports on empirical studies that investigated the effects of poetic language use on cognitive and emotional processing, aesthetic liking and access to memory.

In its second part, the lecture reports on a series of studies that––based on presenting poems––revisited the old-new question of whether or not we indeed take pleasure in negative emotions in art-reception and, if yes, which psychological mechanisms underly this special type of pleasure.

Winfried Menninghaus
Max Planck Institute for Empirical Aesthetics, Frankfurt a. M.

Winfried Menninghaus has researched and taught as a professor of general and comparative literature at the Freie Universität Berlin and at the universities of Yale, Princeton, Berkeley and Jerusalem. From 2013 to 2022 he was director of the department „Language and Literature“ at the Max Planck Institute for Empirical Aesthetics in Frankfurt. He has written books on fundamental aesthetic issues and on a variety of literary authors from the 18th century to the present day. In his empirical studies, too, he has examined in particular the special characteristics as well as the cognitive, emotional and aesthetic implications and effects of poetic and rhetorical language use.

Models, Metaphors, Metaphysics – A Wittgensteinian Approach to Knowledge in Art, Philosophy, and Science

David Hommen
Philosophy, Heinrich-Heine-University, Düsseldorf

Wittgenstein explicitly relates the method of surveyable representation to aesthetic descriptions in the arts (cf. CV, 29) and to the phenomenon of aspect perception or "seeing as" (PPF, Sect. xi) – and the truths obtained by this method to the truths of poets and musicians (CV, 46). Here, it will be shown how a transfer of this idea to scientific models solves the puzzle of idealization outlined above. On the basis of the semantics and epistemology of surveyable representations as understood by Wittgenstein, a Wittgensteinian view of scientific models is developed which, it is argued, is both able to sustain a robustly realist approach to science and to explain why models are epistemically valuable in the first place. It is also shown, however, that this view entails a peculiar kind of scientific knowledge, namely one which is partly tacit and in a certain sense ineffable.

Modeling is an important scientific method of representing and understanding real-world phenomena. Models provide idealized representations of their target systems in the sense that their descriptions of those targets are intentionally incomplete and/or inaccurate (cf. Frigg & Hartmann 2020). However, given that science strives for as correct knowledge as possible about the world, the idealized nature of models raises an epistemological conundrum: How can one learn something true about real-world phenomena by studying models of them that are knowingly false? A modeling stance in science seems either epistemologically deficient or contrary to the realist aim of science (cf. Knuuttila 2005, 43; Callender & Cohen, 2006, 67; Svetlova, 2014, 562).

In this talk, Wittgenstein's method of "surveyable representation [übersichtliche Darstellung]" (PI, § 122) is proposed as an alternative approach to scientific modeling that steers clear of the dilemma between epistemic futility and antirealism. Modeling is an important scientific method of representing and understanding real-world phenomena. Models provide idealized representations of their target systems in the sense that their descriptions of those targets are intentionally incomplete and/or inaccurate (cf. Frigg & Hartmann 2020).

However, given that science strives for as correct knowledge as possible about the world, the idealized nature of models raises an epistemological conundrum: How can one learn something true about real-world phenomena by studying models of them that are knowingly false? A modeling stance in science seems either epistemologically deficient or contrary to the realist aim of science (cf. Knuuttila 2005, 43; Callender & Cohen, 2006, 67; Svetlova, 2014, 562). In this talk, Wittgenstein's method of "surveyable representation [übersichtliche Darstellung]" (PI, § 122) is proposed as an alternative approach to scientific modeling that steers clear of the dilemma between epistemic futility and antirealism.

Wittgenstein explicitly relates the method of surveyable representation to aesthetic descriptions in the arts (cf. CV, 29) and to the phenomenon of aspect perception or "seeing as" (PPF, Sect. xi) – and the truths obtained by this method to the truths of poets and musicians (CV, 46). Here, it will be shown how a transfer of this idea to scientific models solves the puzzle of idealization outlined above. On the basis of the semantics and epistemology of surveyable representations as understood by Wittgenstein, a Wittgensteinian view of scientific models is developed which, it is argued, is both able to sustain a robustly realist approach to science and to explain why models are epistemically valuable in the first place. It is also shown, however, that this view entails a peculiar kind of scientific knowledge, namely one which is partly tacit and in a certain sense ineffable.

Callendar, C., & Cohen, J. (2006). There Is No Special Problem About Scientific Representation. Theoria 55, 67–85.
Frigg, R., & Hartmann, S. (2020). Models in Science. In Zalta, E. N. (Ed.), The Stanford Encyclopedia of Philosophy (Spring 2020 Edition), from https://plato.stanford.edu/archives/spr2020/entries/models-science/
Knuuttila, T. (2005). Models as Epistemic Artefacts. Toward a Non-Representationalist Account of Scientific Representation. University of Helsinki.
Svetlova, E. (2014). Models at Work—Models in Decision Making. Science in Context 27(4), 561–577.
Wittgenstein, L. (1998). Culture and Value. A Selection from the Posthumous Remains. Ed. by G. H. von Wright and H. Nyman. Trans. by P. Winch. Revised Ed. of the Text by A. Pichler. Blackwell Publishers. (Cited as CV)
— (2009a). Philosophical Investigations. Ed. by P. Hacker and J. Schulte. Trans. by G. E. M. Anscombe, P. M. S. Hacker, and J. Schulte. Rev. 4th ed. Blackwell Publishing Ltd. (Cited as PI)
— (2009b). "Philosophy of Psychology – A Fragment". In Philosophical Investigations. Ed. by P. Hacker and J. Schulte. Trans. by G. E. M. Anscombe, P. M. S. Hacker, and J. Schulte. Blackwell Publishing Ltd. (Cited as PPF)

(How) Do Models Exemplify? Some Thoughts on Wet Lab Models in the Life Sciences

Danka Radjenović
Philosophy, University Kaiserslautern-Landau

Currently working on her PhD under the title: Wittgensteins spätere Philosophie als Grammatik des Lebens Her philosophical interests include: philosophy of language, philosophy and history of science, philosophy of technology, aesthetics (especially modern and contemporary theories in aesthetics) and ethics (ancient and contemporary ethics) Affiliation: Rheinland-Pfälzische Technische Universität Kaiserslautern Landau (RPTU), Institut für Philosophie Landau

In his book Languages of Art Nelson Goodman introduced the relation of exemplification as characteristic of the way that works of art can be said to symbolize. Goodman considered exemplification to be one of the symptoms of the aesthetic, one that helps distinguish arts from other symbol systems. Taking Goodman's ideas further, Catherine Z. Elgin argued that exemplification plays an equally important role in the sciences, as it does in the arts. Elgin names several cases of exemplification in the sciences, cases that range from the activity of collecting and interpreting samples (cases similar to Goodman's prominent example of tailor's swatch) to entire experiments, the elements of which are said to exemplify, rather than simply refer to or depict the features of the phenomena that they are set up to explore.

The aim of my paper is to show how exemplification can be said to obtain in the case of wet lab models in the life sciences. If it can be shown that models exemplify that which they are models of (their targets), this can help us avoid some problems pertaining to representation, such as its arbitrariness. For one thing, as Elgin points out: exemplification is selective. What exactly is exemplified depends on the intentions of practitioners, their goals and research questions and allows for different inferences. Another feature of exemplification is that it commonly includes instantiation of some properties belonging to the phenomena that are being explored. Taking Elgin's example: sample of water taken from a pond instantiates certain substances contained in that water, while the whole sample at the same time exemplifies the water in the pond. In this regard exemplification can be said to provide a direct link between the model and particular features of reality, that does not obtain if we think of models as representing primarily by means of similarity with their targets. In conclusion, I will point out to potentials, as well as limitations of understanding the relation between wet lab models and their targets in terms of exemplification.

The Problem of Negation in Visual Models

Jasmin Trächtler

Philosophy, Technical University Dortmund

I studied history of art and philosophy at the University of Kassel and received my Ph.D. in philosophy from the University of Bergen and the University of Kassel in 2021, with the thesis Wittgensteins Grammatik des Fremdseelischen ("Wittgenstein's Grammar of Other Minds"). I have been a research fellow at the Wittgenstein Archives at the University of Bergen (2018–2021) and the Institute for Philosophy at Université Paris 1, Panthéon-Sorbonne in Paris (2020). I was the leader of the Bergen Network for Women in Philosophy (2019–2021) and am ambassador for the Society for Women in Philosophy in the Ruhr area. Since 2021, I'm a postdoctoral researcher at the department for philosophy at TU Dortmund working on my habilitation project on "Objectivity in Visual Scientific Modelling". In summer 2022, I participated in the summer school "Representation in Art and Science" by the Institute Vienna Circle supervised by Catherine Z. Elgin, Chiara Ambrosia and Dominic McIver Lopes.

The problem of negation in visual models and other representations is that they cannot show, what is not shown, whereas in language it is perfectly possible to say what is not said. In other words, a negative statement always contains the negated statement, while visual representations either show something affirmatively or nothing but they cannot specify what is not shown. Consequently, as probably most famously stated by Wittgenstein, there is no visual negation. This, however, is problematic because negation is needed in order to express "withdrawals" and dichotomous structures, thus fulfilling important epistemic functions that visual representations generally do not have. The impossibility of visual negation thus has far-reaching consequences for visual models in science and the epistemic use of representations in general.

In this talk I want to discuss the problem of visual negation and its epistemic consequences for visual models in science. To this end, I will first briefly outline what exactly is meant by "negation" here and discuss some candidates for visual negation. Negation, understood not in a metaphorical but in a narrower, linguistic-logical sense, serves as an expression of what is not (the case). Following Frege (1986), negation can be conceived as an operation applied to the negated proposition, thus articulating an exclusionary contradiction. Candidates of visual negation, on the other hand, can at best represent inclusive contrasts in which the negated element is not evident as such. Drawing on the works of Goodman (1968) and Elgin (1983, 2017), I will argue in the next section that the impossibility of visual negation in this narrower sense is structural: Since visual representations have a syntactically dense structure, their representational elements appear affirmatively and "on a par". Negation as an operation, on the other hand, requires a structure of disjoint and finitely differentiated signs by which the negated element is unambiguously determined and which also enables repeated application, as in the case of double negation. In the last section, I will elaborate the epistemic consequences of this structural impossibility of visual negation: negation can be used to articulate contradictions, dichotomous structures and true-false-distinctions that visual models lack due to their affirmative mode of representation. Furthermore, visual models to not have other "withdrawals" related to negation, such as hypotheses and probabilities. I will show that this places visual scientific models in a difficult relationship with their corresponding theories, and conclude by opting for an understanding of visual scientific models as distinct constructions.

Brandom, R. (1994). Make it Explicit. Reasoning, Representing, and Discursive Commitment. Harvard University Press.

Frigg, R. & Nguyen, J. (2020). Modelling Nature: An Opinionated Introduction to Scientific Representation. Springer.

Knuuttila, T. (2011). Modelling and representing: An artefactual approach to model-based representation. Studies in History and Philosophy of Science Part A, 42(2), 262–271.

Conceptualizing a Pragmatist Artifactualism

Mariano Martín Villuendas

Philosophy, University of Salamanca)

Mariano Martín Villuendas is a predoctoral fellow in the Department of Philosophy, Logic, and Aesthetics at the University of Salamanca-ECyT. His research interests include the problem of scientific understanding and representation, cancer modeling, and pragmatism.

One of the main problems shaping the current research landscape in the philosophy of science is determining which properties confer to model systems their representational character. This problem, which could be labeled as “the scientific representation problem (SR-P)”, has traditionally been addressed by conceiving the representational character in terms of some shared features connected by some particular representational relationship, such as similarity or -morphism. However, these representationalist approaches have faced several difficulties, such as the widespread use of holistically distorted models or the existence of mutually inconsistent representations of the same phenomenon.

In recent years, an alternative theoretical approach, known as artifactualism, has emerged (Knuuttila, 2011). In contrast to the previous one, this proposal does not rely on the representationalist assumption. Rather, the artifactual approach argues that models should be understood as artificial systems of dependencies intentionally elaborated to provide answers to specific scientific questions. Although artifactualism has been able to cope with the problems faced by the representationalist approach, it still faces a major problem: it does not provide standards to assess whether or not the results obtained through the manipulation of the artifact are justified apart from satisfying the proposed research goals. This last point has raised concern since associating the adequacy of the answers exclusively with the satisfaction of contextually specified evaluative criteria runs the risk of raising the shadow of relativism.

The main goal of the talk will be to argue in favor of artifactualism by addressing the aforementioned problem. To do so, I will first contend that the problem faced by artifactualism derives fundamentally from the formulation established by Knuuttila regarding the notion of artifact. To overcome it, I will offer an alternative analysis of this concept.

Second, drawing on the pragmatist-inferentialist tradition (Brandom, 1994), I will develop normative standards to evaluate the outcomes resulting from the use of these epistemic artifacts. These considerations will allow me to show to what extent artifactualism constitutes the best theoretical approach to answer SR-P.

Brandom, R. (1994). Make it Explicit. Reasoning, Representing, and Discursive Commitment. Harvard University Press.

Frigg, R. & Nguyen, J. (2020). Modelling Nature: An Opinionated Introduction to Scientific Representation. Springer.

Knuuttila, T. (2011). Modelling and representing: An artefactual approach to model-based representation. Studies in History and Philosophy of Science Part A, 42(2), 262–271.

Model Organisms as Representations

Lorenzo Sartori

Philosophy of Science, London School of Economics and Political Science

Lorenzo Sartori is a PhD candidate in Philosophy at the London School of Economics and Political Science (LSE). Previously, he studied at the University of Trento and the University of Bologna, with study periods at the University of Vienna and at Columbia University (NY). He also completed a Master's degree in Philosophy of Science at the LSE. His main research interest lies in the field of general philosophy of science, with particular focus on scientific representation and modelling. His interest also encompasses scientific thought experiments, the relation between science and the arts, and the semantic and epistemic features of visual representation.

Recent debate in philosophy of experimental biology shows considerable disagreement around the epistemological features of so-called model organisms (MOs). Ankeny and Leonelli (2020) have argued that MOs represent other organisms like other scientific models do with their targets. In contrast, Weber (2004, 2014) contends that representation plays little, if any, role when it comes to MOs. Also, Levy and Currie (2015) explicitly argue against a representational account of MOs and advocate for a qualitative difference between Mos and other examples of scientific models.

In this paper, instead of asking whether MOs are models, I focus on the question whether MOs function as representation, and I answer affirmatively. Specifically, I develop Ankeny and Leonelli's proposal by applying the resources of the DEKI account of scientific representation (Frigg and Nguyen 2020) more substantially. In particular, I deploy DEKI's concepts of exemplification and keying-up in order to give an account of MO-based inferences. I contend that a MO-based inference is valid when the MO accurately represents its designated target with respect to the relevant properties the inference is about. A MO accurately represents its designated target, if any, insofar as it exemplifies certain properties, and these properties are imputed to the target via the right key, namely a mapping function that translates the set of properties of the target into the set of properties possessed by the target.

In this way, I achieve two intertwined goals. First, I clarify the representational function of MOs in bio medical research. Particularly, I show the urgency to clarify what are the keys involved in the MO-based surrogative reasoning. At the same time, I make the case for the DEKI account of representation by using MOs as an exemplificative case-study and comparing their use in biology to other common examples of scientific models. More broadly, via the conceptual toolkit provided by DEKI, this analysis allows me to illustrate very general aspects of representation, and so to delineate the deep connections running between scientific models and examples of artistic representation.

Ankeny R. and Leonelli S. (2020). Model Organisms. Cambridge University Press.
Frigg R. and Nguyen J. (2020). Modelling Nature. Springer.
Levy A. and Currie A. (2015). Model Organisms are Not (Theoretical) Models. BJPS. 66(2). 327–348.
Weber M. (2004). Philosophy of Experimental Biology. Cambridge University Press.
--- (2014). Experimental Modeling in Biology: In Vivo Representation and Stand-Ins as Modeling Strategies. Philosophy of Science. 81(5). 756–769.

Simulation, Duplication and the Moebius Strip – Literary Thought Experiments on Disengagement of Space, Time and Identity in Times of Digitalization and AI

Nick Bostrom has explored in his works the philosophy of living in a world simulated by AI as the consequence of the development of a superintelligence that controls mankind (cf. Bostrom 2003 and 2014). The world, as it is perceived, is "not located at the fundamental level of reality" (Bostrom 2003: 11) and reality "may thus contain many levels [...] and the number could be increasing over time." (Bostrom 2003: 12)

Hervé Le Tellier's novel L'anomalie (2020) as a playful thought experiment on Bostrom's theory narrates the story of duplicated realities, in which planes with the same passengers depart and land again and again. Philosophers and scientists of many fields try to understand and explain the phenomenon by applying and quoting diverse physical and philosophical theories but only Bostrom's theory of a simulated world seems to be plausible for what has happened. The narration is constructed around the different characters (passengers and their duplications, politicians, scholars) taking an omniscient view and thus putting the reader in the position of the spectator observing the simulation.

Raphaela Edelbauer creates in her novel Dave (2021) a world in which people live and work to realize the perfectionist disembodied AI who should redeem humanity from all evil. People have closed themselves off the outside world, living now in a laboratory, a claustrophobic heterotopia in Foucault's (2021) understanding. In this world, time and space lose their linearity, places start to waver and sway, chronology overlaps and the first person narrator Syz seems to live and exist in various timelines and spaces. Only when Syz dares to leave the heterotopian place to explore the external world, he recognizes that he has lived in a posthuman simulation – a memory place in which he is prisoner and designer at once. The aesthetic conception of the novel like a Moebius strip surmounts duality of encounters in Deleuzian terms (cf. Deleuze 1993, Cockayne et al. 2019), exemplifies Haraway's postmodern end of ontological oppositions of the organic, the technical and the textual (Haraway 1991), and thus mirrors the diegesis: numerous allusions, blending of contrasting scenes, mysterious cross-fades, confusing quotes, propaganda material, collages of scholarly and philosophical theories are complexly interlaced with the first-person narration (cf. Plieseis 2023).

Realizing Baudrillard's (1981) conception of simulation in which signs have lost their referentiality, these novels respond to physical and philosophical thought experiments based on digital innovations. Identities are fragmented and dissociated, symbiotic dualisms are overcome. Linked to the narratological concepts of fake and unreliability (cf. Strässle 2019) by blurring intentionally knowledge and non knowledge and by applying plausibility and merging strategies, the texts gain autonomy and can be received as new perspectives on epistemological practices to model possible worlds based on physical theories and digital innovations.

Nicole Brandstetter

English Studies, University of Applied Sciences Munich

Nicole Brandstetter studied English and French literature and language at the University of Regensburg (Germany) and the Université de la Bretagne Occidentale / Brest (France). After her studies, while obtaining her doctorate, she worked in an interdisciplinary research group in a graduate program on the analysis of aesthetic lies. In 2005, she gained her PhD in Romance studies (French literature) on the topic of strategies of stage-managed inauthenticity in the postmodern French novel. After that, she worked as PR manager and was responsible for projects and campaigns for customers from various business areas. Afterwards, she worked for 10 years in a private educational institute. Besides teaching English and French, she was deputy head of school and later provisional head of school. She managed the organizational development process and was responsible for human resource management, marketing, public relations, and development of the educational program concerning didactics and content. In September 2015, she was appointed professor for English at the University of Applied Sciences Munich (Germany), where she is now not only responsible for the English modules of the general electives in the Department of General and Interdisciplinary Studies, but also for integrated language programs for the Department of Electrical Engineering and Information Technology. Her areas of expertise and research interests are narratives of digitalization, scholarship of teaching and learning, and concepts of authenticity, inauthenticity, and lying in literature.

Baudrillard, Jean (1981). Simulacres et Simulation. Paris: Éditions Galilée.

Bostrom, Nick (2003). "Are you living in a computer simulation?" in: Philosophical Quarterly, Vol. 53, No. 211, pp. 243–
255.

Prof. Dr. Nicole Brandstetter, Hochschule München

Bostrom, Nick (2014). Superintelligence. Paths, Dangers, Strategies. Oxford: Oxford UP.

Cockayne, Daniel; Ruez, Derek; Secor, Anna J. (2019). "Thinking space differently: Deleuze's Möbius topology for a theorisation of encounter", in: Trans Inst Br Geogr. 45, pp. 194–207.

Deleuze, Gilles (1993). Logik des Sinns. 8. Aufl. Berlin: Suhrkamp.

Edelbauer, Raphaela (2021). Dave. Stuttgart: Klett-Cotta.

Foucault, Michel (2021). Die Heterotopien. Der utopische Körper. Zwei Radiovorträge. Zweisprachige Ausgabe. 5. Aufl. Frankfurt: Suhrkamp.

Haraway, Donna (1991). Simians, Cyborgs and Women: The Reinvention of Nature. London: Free Association Books.

Le Tellier, Hervé (2020). L'anomalie. Paris: Gallimard.

Abstracts SLSAeu '23

Plieseis, Renate (2023). "Raphaela Edelbauers DAVE – im Spannungsfeld von Zeit, Subjekt und Sprechakt", in: Brötz, Dunja et al. (eds.) Menschmaschinen / Maschinenemenschen in der Literatur.
Golems, Roboter, Androiden und Cyborgs als das dritte Geschlecht. Universität Innsbruck: Innsbruck university press, pp.
205–222.

Strässle, Thomas (2019). Fake und Fiktion. Über die Erfindung von Wahrheit. München: Carl Hanser.

Hacking as Literary and Technological Reciprocity

This paper positions computer hacking – as practice, image, and culture – as a site from which to forge methodological connections between cultural studies and computing technology. The figure of the computer hacker came to public attention with the publication of Steven Levy's Hackers (1984). With the mainstreaming of the personal computer and the internet in the 1980s and 1990s, hacking began to accrue negative connotations (Coleman 2012), accompanied by much debate within the hacking community (Thomas 2002; Jordan 2017). Himanen (1999) and Wark (2004) evolved the term conceptually and philosophically, with the result that hacking began to connote a more general cultural attitude. Clearly, the history of the computer is intimately bound up with the history of hacking, and the rise of the computer as an interactive medium is inextricable from the emergence of the hacker as the Janus-faced figure of the Information Age. This paper will discuss the literary, popular, and cultural texts that accompanied this process, including Neuromancer (Gibson 1984), WarGames (Badham, 1983), V for Vendetta (Moore and Lloyd 1982), Watchmen (Moore and Gibbons, 1986), "The Conscience of a Hacker (The Mentor, 1986), reading these texts in the context of technological developments of the period that formed both hacking and hackers and our current technologized existence.

Semantically and contextually, "hack" is a rich site for the pursuit of literary and technological reciprocity. The ability of "hack" to contain contradictory meanings directly informed its adaptation by computer technologists at MIT in the 1950s and 1960s. "Hack" means both an ugly fix and an elegant solution; the term refers to time-consuming and to quick work; it applies both to programming and to a programmer; and the term is often evoked as a concept that defies or eludes definition (Raymond 2003). "Hack" captures the wide range of uses for technological tools and the ambivalence that attaches to those who wield them. It is a strikingly mobile term, best understood as a creative use of systems such as language and law (Levy 1984, Coleman 2013) as well as of technologies and media (Raymond 2003, Taylor 1999), evidenced by the productive symbiosis between hackers and their media representation (Thomas 2002, Graham 2012). The goal of the discussion is to establish the role that literary and popular culture works have played in forming and fashioning our Digital Age, an age characterized by the very symbiosis between human beings and digital information that the hacker personifies.

Naomi Mandel

American Studies, Hebrew University, Jerusalem

Naomi Mandel is Ann and Joseph Edelman Professor of American Studies at the Hebrew University. She is the author of Against the Unspeakable: Complicity, the Holocaust, and Slavery in America (University of Virginia Press, 2006) and Disappear Here: Violence After Generation X (Ohio State UP, 2015), and has edited essays on contemporary extreme fiction and U.S. author Bret Easton Ellis. Her most recent work, which focuses on the Digital Revolution and the Information Age, is published in Comparative Literature Studies 56.4 (2019), Electronic Book Review, and Mosaic (forthcoming). This project is supported by ISF 1555/20.

Coleman, E.G. 2012, "Phreakers, Hackers, and Trolls: The Politics of Transgression." In The Social Media Reader. Ed. Michael Mandiberg. New York: NYU Press, 2012. 99–119.
Coleman, E. G. "Hacker." In The Johns Hopkins Guide to Digital Media. Eds. M-L. Ryan, L.Emerson, B. J. Robertson. Johns Hopkins UP, 2014. 245–49.
Gibson, W. Neuromancer. New York Ace, 1984.
Graham, R. "No, 'Hacker' really does mean 'hacker.'" Errata Security. Robert Graham. 8 Aug 2012. Web.
Himanen, P. The hacker ethic and the spirit of the information age. New York: Floris Books, 1999.
Jordan, T. "A Genealogy of Hacking." Convergence 23.5 (2018): 528–544.
Levy, S. Hackers: Heroes of the Computer Revolution. First ed. Garden City, N.Y.: Anchor/Doubleday, 1984.
The Mentor. "The Conscience of a Hacker." Phrack 1.7)1986). Web.
Moore, A and D. Gibbons. Watchmen. 1986-1987. New York: DC Comics, 2005.
Moore, A. and D. Lloyd. V for Vendetta. 1982. New York: DC Comics, 1990.
Raymond, E.S. "The on-line hacker Jargon File, version 4.4.7. 29 Dec 2003. Web.
Taylor, P. Hacking: Crime in the Digital Sublime. New York: Routledge, 1999.
Thomas, D. Hacker Culture. Minneapolis: U of Minnesota P, 2002.
Wark, M. A Hacker Manifesto. Cambridge, Mass.: Harvard UP, 2004.
WarGames. John Badham, dir. United Artists: MGM/UA Entertainment, 1983.

An Engineering-Inspired Account of Knowledge

Iman Ferestade
Mechanical Engineering, Simon Fraser University, Burnaby, CAN

I am a MA philosophy graduate from Simon Fraser University (SFU) in Canada. I am also a Ph.D. graduate in Mechanical Engineering from Iran University of Science and Technology (IUST). I have also been a visiting scholar at Virginia Tech University's Mechanical Engineering department. My research interests are philosophy of computation, philosophy of applied mathematics, and philosophy of physics (classical mechanics).

The question of how scientists obtain knowledge from running computer simulations plays an integral role in the epistemology of modern science. In the literature on computer simulations, it is assumed that knowledge about the results of computer simulations is grounded in the knowledge of the process through which computer simulation results are achieved. On that basis, two widely recognized accounts are developed: an internalist account, which holds that computational simulations are just computeraided arguments, and an externalist account, which holds that computational simulations are a kind of experiment in their own right. In my paper, I introduce an engineering-inspired account of computational simulation knowledge that transcends the internal-external dichotomy. I show that if the model entered into the simulation is well-conditioned, and the residual resulting from plugging the computed solution into the defining equation is sufficiently small, we can claim to know that the computer-generated solution is approximately true. Checking the residual is an internal component because it is calculated by computer users to give justification for the computed solution, whereas well-conditioning is an external component because it is merely a property of the model used in the simulation and is, therefore, beyond the control of computer users. Based on this account, knowledge can be gained through computer simulation even if the simulation process or the nature of computer simulations remains opaque, since the method of justification can be different from the method of discovery. In conclusion, I highlight the fact that computational simulations are more akin to argumentation than arguments.

Reading JPEG: The JPEG-1 Specification as a Key Text in the Production of Digital Photographic Images

Liam Mullally
Cultural Studies, University of London

I'm a PhD student in cultural studies at Goldsmiths, University of London. My work focuses on the circuit between the technical and aesthetic aspects of digital audio-visual culture, seeking to resurrect a materialist account of such things through close readings and cultural histories of the obscure and overlooked processes of digital circulation.

Where and how can we read the processes of digital culture? What do we learn, for instance, about the construction of digital processes by reading a technical standard? My paper presents a close reading of the JPEG-1 compression standard (ISO/IEC 10918-1), supported by extensive interviews with surviving JPEG-1 engineers, as an investigation into the legibility such specifications. It asks to what extent such a reading can clarify the material construction of applied technical codecs and the ubiquitous signals they produce.

JPEG-1 was first developed in the late 1980s and early 90s as a compression standard for visually complex still images (i.e. photographs and similar images, not graphics or text). Just over thirty years since publication it remains the most popular compression mode for digital images: each year more JPEG images are made than the year before (more, in fact, than film photographs that have ever been produced). Historically, there is a strong argument that JPEG is the key material formation of the photographic image, and yet its cultural importance has barely been studied.

The work embodied in its standard is also the theoretical origin of perceptual coding – a category of lossy audio-visual compression utilized in MPEG, MP3 and most lossy audio-visual codecs that considers a model of the human sensory system as part of its process. The result is a technical standard curiously active in its theorization of culture: from its establishment of the codec as an embodiment of the varied aspects of a coding process, to its assertion that human physiology should be considered part of the decoding process, not external as in Claude Shannon's theorization but an active participant in the channel.

JPEG remains an ambiguous term. Properly speaking, it is an acronym of the Joint Photographic Experts Group, a committee gathered in 1986 to develop still image compression standards for long defunct videotex services. But "JPEG" is also commonly used to describe that standard, the mode of compression it defines, the files produced by such a process (.jpg files) and, most popularly, the images those files hold. My paper is interested in the unstable relationships between these different semantic registers of "the JPEG". The JPEG-1 standard, my paper will argue, sits at their juncture as an active theorization of its subject matter, an abstraction which secretes materiality.

Green Discourse, the Energy/Materials Ecosystem, and Technologies of Environmental Care

Green discourse purports to express science whose theoretical, observational, and normative elements are in accord: climate change caused by legacy industrial infrastructure that converts energy and matter in linear modes that produce waste can be ameliorated by new infrastructure that converts energy and matter in holistic modes that yield zero waste. In important ways, however, the elements of this syllogism are in discord. Green discourse models society as an energy/materials ecosystem, and while other forms of physical and biological essentialism align with and reinforce the capitalist social order, with its ontology of morally acceptable imbalance, implementing the energy/materials ecosystem within this ontology has caused serious epistemic vertigo. Policymakers have coped with the costs and complexities of closing the circle of the energy/materials conversion chain by focusing on particular infrastructural components over others and signifying them as technologies of environmental care worthy of public support. These privileged objects perform important ideological work demonstrating proof of principle and establishing model markets for green goods and services but complicate and even contradict the goal of building the net-zero circular economy. This paper, based on original research including a new book (Age of Auto Electric: Environment, Energy, and the Quest for the Sustainable Car, MIT Press 2022), explores the instrumentalization of the energy/materials ecosystem metaphor in technologies of environmental care and analyzes the social/environmental paradoxes these objects foster.

Matthew Eisler

History of Science and Technology, University of Strathclyde, Glasgow

Matthew N. Eisler is a historian of science and technology interested in the co-production of energy and environmental policy and clean technology (cleantech) innovation. Dr Eisler interrogates how scientists, engineers, entrepreneurs, and policymakers interpret energy and environmental problems, translate those problems into their own disciplinary languages, and negotiate the parameters of cleantech. He explored these ideas in his first book, a history of an advanced power source technology (Overpotential: Fuel Cells, Futurism, and the Making of a Power Panacea, Rutgers University Press 2012). Dr Eisler developed these ideas in his second book (Age of Auto Electric: Environment, Energy, and the Quest for the Sustainable Car, MIT Press 2022), a history of the contemporary electric vehicle (EV) that also explores the emergence of the EV power source business. Dr Eisler also writes for public audiences on technology and public policy in publications including Slate (https://slate.com/author/matthew-n-eisler(https://slate.com/author/matthew-n-eisler); magazine and Issues in Science and Technology. Dr Eisler is also one of the founders and principals of the Centre for Interdisciplinary Sustainable Practices of Research in Energy (C-INSPRE), an innovative program of doctoral training at the University of Strathclyde.

Models of Worlding. An Analysis of the first Polish Handbook of Modern Forestry as a Vehicle for Environmentality

The 18th century was crucial in shaping modernity. It was then that the notions of universal, ahistorical nature contrasted with local, historical culture (Descola 2013; Latour 1993), unified linear time and environment were formed. Impact of these notions made it possible not only to change individual patterns of action, but also to produce the complex institutions and infrastructures governing life (Feral 2021) that re/produce the modern world. The modern world is not the only possible or existing world – its existence is the result of the displacement/hiding/subordination of the different worlds (de la Cadena 2015; Mignolo 2011). The process of its continuous reproduction is made possible by onto epistemological models for the mastery of the rabble (Moll, Pospiszyl 2020). While the nature-culture opposition time has been described as specific elements constituting the modern world, the environment is still treated as a neutral concept. Modern scientists and politicians "take it as self-evident that everywhere people, too, are drawn into relations with the things, beings, and entities that form their environment"(Strathern 2020: 4). The purpose of the paper is to analyze the environment as a modernity specific model for understanding/organizing relations, which is a tool for the re/production of a modern world ready to embrace biopolitical power.

The analysis focuses on the influential economic manual About Trees and Wild Herbs written by Jan Krzysztof Kluk (1739–1796) called "the first Polish forestry guide book". It was one of the vehicles of the modernity intended to establish a modern forest subordinated to timber production in the lands of the Polish-Lithuanian Commonwealth. It popularized a model of perceiving and shaping the world as an environment. The analysis of About trees... will allow to examine the environmental model of organizing the world, which enabled Kluk to separate trees as units, protect them from pollution (Tsing) and introduce other solutions to maximize the harvested wood mass. Thus, it is a vehicle for environmentality. The concept of environmentality is "[a] union of environment and Foucauldian governmentality" (Agrawal 2005: 8) and, depending on the researcher, can be understood "as a more rational mode for the environmental management of forest resources, rural development, resilient communities, or green politics" (Luke 2011: 2). Examining Kluk's textbook will provide a deeper understanding of environmentality as a worlding matrix. Thus, reconstructing the model of environmentality contained in About Trees... revealing the onto-epistemological specificity of a common (in the modern world) tool of worlding that has so far remained invisible.

Konrad Kopel

History and Cultural Theory, University of Silesia, Katowice

Konrad Kopel is a member of the Cultural Theory and History research group on University of Silesia in Katowice. Interested in formation and diffusion of modernity in Polish–Lithuanian Commonwealth, poststructural philosophy and pluriversal anthropology. His articles were published in „Prace Kultur-oznawcze", „Perspektywy Kultury", „Świat i słowo". He is also a co-founder of a nongovernmental organization „Przestrzeń Otwarcia" which is focused on etnographic researches as well as fighting against social inequality. Since 2018, he has been studying in the College of Interdisciplinary Individual Studies at the University of Silesia in Katowice. He completed courses in the departments of anthropology, philosophy, and history. Currently he is writing his master's thesis titled Biopolitics of forest. Jan Krzysztof Kluk's „On trees and wild herbs, forests etc." as a project of a modern environment.

The Holobiontic Figure: Cultural Complexities of Holobiosis in Joan Slonczewski's Brain Plague

Teun Joshua Brandt
Literary Studies, University of Groningen

Teun Joshua Brandt is currently an interfaculty PhD student at the University of Groningen. His research focuses on narratives of symbiosis in contemporary science fiction, combining both perspectives from the philosophy of biology and literary studies. With a thesis on deep-sea narratives and the microbial imagination, he received his master's degree, summa cum laude. He is passionate about hydrothermal vents, gut bacteria and great literature—preferably all combined.

A growing body of research indicates that humans are holobionts: multispecies conglomerates consisting of a host and their microbiota. Microbes inhabit every inch of the human body. They have coevolved with their host and are essential to its functioning. Dysbiosis, the disruption of the microbiome, may cause severe illness, such as obesity or cancer, as well as cognitive dysfunction and impairment. In light of this scientific knowledge, philosophers of biology like John Dupré, Scott F. Gilbert or Alfred I. Tauber have urged a reconsideration of biological individuality and autonomous individual agency. As important as their arguments are to our fundamental understanding of what it means to be human, they have scarcely entered the realm of literary studies. In this paper, I propose to consider the Holobiontic Figure as a starting point for examining how literary fiction can help us to understand the holobiont concept's cultural complexities.

By means of formal analysis, this paper explores what the holobiont concept affords beyond scientific discourse – how it relates to the social world, what kind of thinking it makes possible, and what kind of order it enforces. With this, it aims to give an answer to the pressing question of how literary representations of scientific concepts are able to transform deeply rooted cultural notions of human being. A body of recent science fiction works is challenging the long-standing narrative of microbes as 'bad germs' and the ever-evolving plot of the pandemic apocalypse by depicting humans as intricately interwoven with their microbial symbionts. The holobiontic characters in these stories struggle with their multitudinous nature, their compromised agency and their dependency on (unreliable) nonhuman symbionts. However, some of them may overcome their fears, accept that their bodies are a carrier for nonhuman others, and eventually bear the fruits of symbiosis. These characters are archetypes in a new cultural narrative of humanness, and like other archetypes, they inflict the development of plot through conflict. Such narratological implications of the Holobiontic Figure will be made viable through a reading of Joan Slonczewski's Brain Plague (2000). In the novel, the depiction of microbial symbionts as agential 'people' clashes with the perceived individuality and agency of the human characters – which makes it a representative case for a better understanding of the symbiosis between scientific concepts and fictive characters in the emerging cultural narratives of holobiontic humans.

Neuro-Avantgarde

Szilvia Ruszev
Media and Communication, Bornemouth University

Dr. Szilvia Ruszev is media artist and researcher working across different media formats. Her broader research interest focuses on sensuous knowledge, montage theories and politics of post-cinema. Her praxis is interested in transdisciplinary experimentation and creative-critical inquiry, challenging the materiality of digital time-based media. She holds a Ph.D. degree in Media Arts & Practice (University of Southern California). Currently, she is a Lecturer at Bournemouth University.

Contemporary capitalism has reached a stage in which production can be achieved through digital labor and the cognitive and affective are be commodified. Capitalism is interested in the colonization of our minds, affects, and desires, and thus positivist brain-centered neuroscience seems to be the perfect field for creating ideas, tools and methods that naturalize contemporary capitalism's ideology. The interdependence of mind-focused capitalism and brain-centered positivist neuroscience results in what some call neuroculture, a neurocentric cultural landscape that revolves around a normalized and biological view of the mind separated from the body. In the realm of the post-cinematic, the recursive process between brain/mind, body and image/culture creates a technologically defined, ocularcentric feedback loop driven by the politics of contemporary capitalism.

Material images, produced by technologies of contemporary capitalism, oversaturate our sensory environment and colonize our minds by imposing mental images conformed to narrow standards defined by contemporary capitalism. As a consequence of the virtual and networked character of the surrounding mediasphere, prescribed by the oppressive ideology of contemporary capitalism, central categories such as the self, time, space and cognition have been re-evaluated.

What kinds of formal-aesthetic gestures might be used under contemporary capitalism to poetically destroy the ideological colonization of our minds, affects and desires? How can montage, understood as a generative and critical embodied praxis, be expanded in the realm of the post-cinematic?

I examine how the entanglement between contemporary capitalism and other oppressive ideologies, such as white supremacy, positivist neurosciences and digital networked technologies, undergirds so called neuroculture. I argue that neuroculture exerts its underlying ideology through images, and conditions specific formal-aesthetic characteristics such as high quality, smoothness, operationality, modulation, fluidity and the manipulative microtemporality. What I call neuro-avantgarde finds itself in the altered image, appropriating technologies of vision by dismissing their ontological specificity: the digital abject, the glitchy, the low resolution and the extremely slow. Neuro-avantgarde is deeply connected to technology, yet it is also in constant friction with the technological tools used to create neuro-avantgarde works. Neuro-avantgarde is at its height when technology fails and when it can create so-called "inflection points" that disturb, invert, or defy the "cognitive assemblage" of human and nonhuman elements on a systematic level.

As a project, Neuro-Avantgarde is an embodied theory. It's custom-built, interactive web-interface invites participants to explore the interplay between theory and practice, following the idea of montage. Ideally, Neuro-Avantgarde would be shown as part of the exhibition, and a paper presentation would give an overview of the theoretical context and the design process.

Is the Importance of Metaphor, Models and Simulations in Science Best Exemplified by Chemistry?

The Call for Papers omitted chemistry (inadvertently, no doubt) from the list of sciences for which metaphor, models and simulations are epistemic tools, whereas I would argue it should be first in the list. Why? Because we have no access whatsoever to the entities and concepts comprising our entire explanatory understanding of chemistry that is unmediated by those tools.Physicists can directly observe moving bodies; astronomers, planets and stars; biologists, organisms and cells (with the aid of a microscope). But chemists cannot see atoms, molecules, chemical bonds, or reaction mechanisms; we can only approach them via methods that clearly belong to one or more of those classifications. Probably the most familiar is the omnipresence of both two- and three-dimensional molecular models; we are completely reliant on other manifestations as well.

Another observation, which may be related to the above, is that philosophers of science have traditionally paid much more attention to physics and (lately) biology than to chemistry (although it is true that philosophy of chemistry has recently become a more active subfield). At the same time, chemists tend not to pay much attention to philosophic matters, preferring just to get on with business. Questions that interest chemical philosophers, such as whether a molecule really has a shape, or what is “the” most correct form of the periodic table, are of little or no concern to practicing chemists. In my opinion that is (usually) an entirely appropriate attitude.

However, it must be acknowledged that there are times when a little more attention to the epistemic status of their methods might benefit chemists. After briefly discussing a couple of cases from recent chemical history where unquestioned deference to modeling and simulation may have played a role in sustaining belief in claims that were subsequently debunked, I will examine in more detail an episode from my own chemical research that suggests a metaphoric connection between literature and science – specifically, how the task of extracting information from spectroscopic results is analogous to that of interpreting (in this case, misinterpreting) a coded message – and propose that exploring such connections can be valuable to scientific practice.

Jay Labinger

Chemistry, California Institute of Technology

Jay Labinger began his career as an organometallic chemist, and has worked in that field in both industry and academia for over five decades; for the last thirty years he has also been active in scholarship along the borders between science and the humanities. His publications include over 200 technical articles and patents; over 50 non-technical articles and book reviews; and books on topics in sociology of science (The Two Cultures: A Conversation About Science, 2001, coedited with Harry Collins), history of science (Up From Generality: How Inorganic Chemistry Finally Became a Respectable Field, 2013), and literature and science (Connecting Literature and Science, 2022). His current position is Administrator of the Beckman Institute at Caltech.

Narratives of Measurements, Models, and Events: How does Physics Work as an Empirical Science?

Physics is essentially written text, but their research papers pursue clear epistemic goals: to introduce new measureable quantities, to develop mathematical descriptions of relations between them, and to simulate possible outcomes in experiments that can be quantitatively verified. Their texts can therefore be classified according to their epistemological functions into narratives of measurements, models, and events. They are characterized by different narrative strategies to achieve intersubjectivity, objectivity, and facticity in physics.

For instance, measurement narratives begin with metaphors that mimetically transfer observations to quantitative scales on a measurement device (e.g., 'voltage', 'current' are represented by observables U,I), thus making them intersubjectively comparable if numerical values are equal. On the other hand, model narratives employ ekphrastic descriptions of structures between observables to detect figurative symmetries (e.g. Ohm's law R=U/I is invariant), which allows to constitute objects in the first place (e.g. material resistance R).

Based on these recognized regularities, event narratives poietically attempt to predict new values for observables, whose facticity can then be established by the occurrence of an identical measurement event. What these narratives of physics have in common is their reference to a non-linguistic world, established by instructions for actions and descriptions for observations. Solely their performance achieves ultimately the intersubjectivity of quantitative metaphors, the objectivity of mathematical models, and the facticity of simulated events. However, their typical modes of narration are a mimesis, ekphrasis and poiesis by which the ontic, structural and teleological statements in physics texts can be recognized. The talk will use selected examples to show how this epistemologically oriented narratology helps to understand how physics works as an empirical science.

Klaus Mecke

Theoretical Physics, University Erlangen-Nürnberg

Klaus Mecke, since 2004 full professor for Theoretical Physics at the Universität Erlangen-Nürnberg, studied philosophy and physics and received his PhD at the LMU Munich in 1993 with a thesis on integral geometry in physics. After research stays in Austin and Boston, he worked in Wuppertal and at the MPI Stuttgart on liquids on the molecular scale and the geometric characterization of spatially complex materials. Recently, he developed a theory of quantum spacetime based on finite projective geometry of event processes. An important aspect of his research at the Erlangen Center for Literature and the Sciences (ELINAS) are the manifold exchange modes between physics and literature. Here, his research goal is a narratology of physics as well as its process-ontological foundation.

The Epistemic Functions of Interformation in Science and Literature: Einstein's Relativity Theory as a Case Study

Einstein's treatise "On the Electrodynamics of Moving Bodies" is considered - as the founding document of special relativity theory (SRT) - one of the most important contributions to physics. The statements of SRT are fundamental, because they reconceptualized basic categories of space, time, mass, and energy. The goal of my paper is the analysis of the scientific modeling process of Albert Einstein's 1905 treatise as well as its semio-logical strategies and its narrative techniques, in order to demonstrate that they are complementary. The paper proposes the concept of interformation as a processual semio-logical operation that frames intersections between narrative and scientific discourses. It is particularly easy to observe it when shifts in the discourse semantics take place, in the case of changes in knowledge structures, which operate with models, epistemic narratives, and simulations and result in epistemic transformations.

I propose the concept of interformation in contradistinction to that of information. In case of information knowledge is exchanged between sender and receiver, whereby there pre-exists a conventional agreement on the code of exchange e.g. the English language. In contrast, interformation explores modes and forms of exchange in which there is no previous conventional agreement on the common code - e.g. physics/mathematics and literature. The code of exchange has to be communicatively renegotiated situatively, contextually and transdiscursively. Following Goodman and Elgin, I assume two forms of reference: denotation and exemplification. While both arts and science use denotation and exemplification as their own ways of symbolization, I propose to see creation as reconfiguration as the third form of mutual semio-logical reference, operating context-specifically through interformation and resulting in epistemic transformations in science and literature.

Aura Heydenreich

German and Comparative Studies, University Erlangen-Nürnberg

Aura Heydenreich is an Associate Professor for German Literature at the Department of German and Comparative Studies, University Erlangen-Nürnberg in Germany. Her research interests include literature and science, mainly focussing on astronomy, optics, relativity theory, postmigrational postmemory studies, and subversive memory cultural practices. 2014 she founded together with Klaus Mecke ELINAS (Erlangen Center for Literature and Natural Science). Since 2014 she edites the publication series „Literature and Natural Science" at DeGruyter, Berlin/Boston. 2017 she was elected vice-president, since 2019 she is the acting president of the European Society for Literature, Science and Arts (SLSAeu). 2022 she was a Distinguished Max Kade Visiting Professor at the German Department of the University of Illinois, Urbana-Champaign. Publications: Wachstafel und Weltformel. Erinnerungspoetik und Wissenschaftskritik im Spätwerk Günter Eichs. Göttingen 2007. Aura Heydenreich, Klaus Mecke (Hrsg.): Physics & Literature. Concepts, Transfer, Aestheticization and Popularization. Berlin: De Gruyter 2021. Upcoming publication: Interformation between Literature and Natural Science: Theoretical Models - Transdiscursive Contact Zones - Epistemic Transformations between Literature, Astronomy, Relativity Theory and Quantum Theory 1600-2020. DeGruyter 2023.

Analogy – a Figure of Mediation between Science and Art

Opinions are divided on the figure of analogy. In the field of science it is seen as a prescientific tool, which only produces preliminary knowledge and has to be proven in a next step with the help of theories or experiments. Analogy is therefore usually assigned to the field of literature, where it falls under the domain of rhetorical figures as part of metaphor theory. In recent analysis in cultural studies it experiences a revaluation as a figure of resemblance or similarity and is seen as a counter-figure to scientific and philosophical conceptual thinking (Gloy and Bachmann 2000; Bhatti and Kimmich 2013). However, the paper presentation aims to show that analogy in its conception in antiquity as well as throughout history is not a merely prescientific figure, but can even be understood as a basic constituent of most scientific disciplines (cf. also Hentschel 2010), and that even in the field of aesthetics it receives its basic epistemic function from its logical-mathematical grounding. Analogy is thus an elementary component of both scientific and aesthetic concepts, and in this respect always mediates between the 'two cultures' (Snow 1993). The special potential of analogy lies in its ability to relate different objects to each other and to establish this relationship beyond the experienceable. In this context, analogy can not only structure the experienceable space as such, but also relates it to imaginary spaces and, with the help of this fictional vanishing point, provide important impetus for new developments in science and research. Analogy therefore is not only a figure that, to speak with Cassirer, operates between the levels of the phenomenal and the structural/imaginary, but also establishes connections between them (Cassirer 1910 [2000]). In addition to basic introductions to the definition of analogy, the paper aims to examine in particular 'models/concepts of the world' through different scientific conceptions and aesthetic narrations from antiquity (Pythagoreans, Plato, Homer) to modern debates (Mandelbrot (fractal universe), Markus Gabriel 2013 and 2021) and will show how analogy is used to make them conceivable.

Sarah Goeth

German Literature, Innsbruck University

Sarah Maria Teresa Goeth is a university assistant (post doc) at the University of Innsbruck. She has finished her dissertation on the topic of ›Analogy – between Science and Aesthetics. A modern figure in the writings of Kant, Novalis and Goethe‹ in December 2020. Befor that she was holding a position as a Research Assistant at the German Department at the University of Hamburg. Her research interests include German Literature in the 18th and 19th Century, the relation and impact of science on literature, the use and circulation of metaphors in different discourses, and picture theory. In her doctoral dissertation she analyses the rhetoric figure »analogy« in the context of science, philosophy and literature in the 18th and 19th century. Sarah Goeth studied at the Universities of Munich and Passau and holds a Master of Fine Arts from the Ludwig-Maximilians-Universität Munich (summa cum laude). After her master's degree, she received a one-year scholarship form the German Academic Exchange Service (DAAD) and taught as a Lecturer at the University of Binghamton, New York. Then she was granted a scholarship by the NFS eikones (Basel, Switzerland). This graduate program gave her the opportunity to collaborate with researchers from different disciplines in order to analyze and discuss the question of the »picture as an artefact«. In her Postdoc-Project she seeks to develop a better understanding of forms of political and social unity by exploring the term of sensus communis in its epistemic, ethic, and aesthetic meanings from antiquity to the present.

Bachmann, Manuel und Karen Gloy (ed.): Das Analogiedenken. Vorstöße in ein neues Gebiet der Rationalitätstheorie. Freiburg i. Br./München 2000.

Bhatti, Anil und Dorothee Kimmich (ed.): Ähnlichkeit. Ein kulturtheoretisches Paradigma. Konstanz 2015.

Cassirer, Ernst: Substanzbegriff und Funktionsbegriff, ed. by Birgit Recki. Hamburg 2000.

Gabriel, Markus: Die Macht der Kunst. Berlin 2021.

Gabriel, Markus: Warum es die Welt nicht gibt. Berlin 2013.

Hentschel, Klaus (ed.): Analogien in Naturwissenschaften, Medizin und Technik. Halle/Saale 2010.

On the Logical Position of the Hypothesis

The concept of the hypothesis is omnipresent across all disciplines of science, be it natural sciences or humanities. Despite the prominent role in everyday scientific work, its true meaning and logical position are, to date, remarkably elusive. In my talk, I will argue that this elusiveness can be traced back to a necessary, twofold collision of categories, which resides at the core of the concept of the hypothesis. First, any hypothesis needs to exhibit a connection to current, already achieved knowledge. At the same time, it may not be directly deducible from this current knowledge. Therefore, the formulation of a hypothesis oscillates between a rational and non-rational aspect. Second, this dichotomic state is, from the very moment of the formulation of the hypothesis, revoked as the hypothesis is not meant to be permanent. Either its rational aspect survives if the hypothesis is shown to be true. Or its non-rational aspect survives if the hypothesis is disproven. Both these cases must be considered as potential outcomes when the hypothesis is formulated and are, until the hypothesis is proven or disproven, simultaneously valid. Hence, in the formulation of the hypothesis, rationality and non-rationality collide twofold. The collision of these two categories cannot be resolved within the position of the categories “rationality” and “non-rationality”. If either of the two colliding categories are emphasized, paradoxes arise, for example in the question of responsibility for scientific research (ethics of conviction vs. ethics of responsibility), which I will discuss in the final part of my talk. The hypothesis must therefore be traced back to its radically individual origin: The researcher who formulated it – nature itself does not know of any hypothesis.

Leonhard Möckl

Max Planck Institute for the Science of Light, Erlangen

Leonhard Möckl studied Chemistry and Biochemistry at LMU Munich and received is PhD in 2015 with a dissertation on the role of the glycocalyx for cell biology and biomedicine. From 2016 to 2020, he was a postdoctoral researcher at Stanford University with W.E. Moerner and Carolyn Bertozzi where he employed super-resolution microscopy to chart the nanoscale architecture of the glycocalyx and developed deep learning-based analysis strategies for single-molecule data. Since 2020, he is an independent group leader at the Max Planck Institute for the Science of Light, where his group integrates advanced optics, biophysics, and biomedicine to investigate the functional role of the glycocalyx in cell biology and develop novel strategies for therapeutic intervention.

A second key focus of his research is the philosophy of science. In this area, he works on three central topics: First, the logical prerequisites for empirical knowledge, in particular the formulation, development, and abolition of hypotheses; second, the interplay between science and society, in particular the role of individual responsibility and critique of science communication; and third, concepts of scientific progress and their relation to non-scientific notions of progress.

Liberating Energy: Investigating Physicists' Use of Anthro-pomorphic Cognitive Metaphors when Modeling Matter-energy Interactions in English and German

In physics, terms relating to the restriction or granting of freedom are frequently employed in the context of matter-energy interactions, as evident in phrases such as "a photon is captured" and "energy was liberated". However, the philosophical concepts of freedom and liberty relate to sentient beings with rights and abilities to make decisions, meaning physical interactions between matter and energy do not literally involve freedom or liberty at all.

This work examines for the first time the hypothesis that physicists' language choices which attribute freedom to certain physical phenomena indicate the existence of related anthropomorphic cognitive metaphors (CMs). It builds on previous investigations into ontological cognitive metaphors (OCMs) for the concepts of energy and heat in physics. However, whereas earlier research focuses on the connections between inanimate phenomena through substance-based OCMs, such as energy as a liquid material, this work opens up a novel and potentially rich area of enquiry into cognitive models relating fundamental physical phenomena to the field of human interactions.

A specific group of frequently occurring metaphors, termed matter-energy confinement metaphors (MECMs), is defined and the results of an extensive series of empirical experiments to investigate their use by physicists are presented. The impacts of the use of MECMs on physicists' reasoning about specific physical processes, such as nuclear fission or particle annihilation, are examined using a methodology adapted from Thibodeau & Boroditsky and the surface-level features of MECMs are investigated via a large-scale online survey. These experiments are conducted in parallel with separate groups of both English and German speaking physicists. By exploring details of the use and effects of MECMs across two languages this work is also the first to allow a direct comparative analysis of both how these metaphors are encoded in language use and the underlying cognitive models they relate to.

The ultimate intention of this research is to establish concrete suggestions for language use among those teaching and learning about energy in physics, particularly in mixed language teaching environments such as those found at many German universities and research institutes.

Peter Hull

English Studies, University of Erlangen-Nürnberg; Max Planck Institute for the Science of Light

Peter teaches at the Friedrich-Alexander Universität Erlangen-Nürnberg (FAU) within the department of English for Academic and Special Purposes, where he is responsible for developing and coordinating the FAU's program of subject-specific English courses for students of the natural sciences. He is also the English Instructor at the Max Planck Institute for the Physics of Light, where he teaches scientific writing and presentation skills to doctoral researchers in Physics.

Amin, Tamer G. 2020. Energy metaphors in science, learning and instruction. In Anke Beger & Thomas Smith (ed.), How metaphors guide, teach and popularize science, 73–110. Amsterdam: John Benjamins Publishing Company.

Brookes, David & Etkina, Eugenia. 2015. The Importance of Language in Students' Reasoning About Heat in Thermodynamic Processes. International Journal of Science Education 37. 759–779.

Lancor, Rachael. 2015. An analysis of metaphors used by students to describe energy in an interdisciplinary general science course. International Journal of Science Education 37. 876–902.

Scherr, Rachel E. 2012. Representing energy. I: Representing a substance ontology for energy. Physical Review Special Topics - Physics Education Research 8. 020114.

Thibodeau, Paul H. & Boroditsky, Lera. 2011. Metaphors We Think With: The Role of Metaphor in Reasoning. PLoS ONE 6(2): e16782.

Medieval Alchemy as Metaphoric Modelling for Polysemy in Jean de Meun's "Roman de la Rose"

Guillaume de Lorris and Jean de Meun's thirteenth century conjoined Roman de la rose as a fictional exploration of courtly love retained its popularity well into the Renaissance. After its first author, Guillaume de Lorris, left the work unfinished in 1236, Jean de Meun continued and completed it at the end of the thirteenth century adding 17,000 lines of verse to the initial 4,000 lines written as a conventional dream allegory. Jean de Meun, a trained scholastic, turned the Roman de la rose into a treatise on many related and seemingly arbitrary topics ranging from courtly love to meteorology, contemporary political issues to scientific or pseudo-scientific topics, such as alchemy.

In my paper, I propose to focus on his lengthy passage on the mechanics and merits of alchemy (ed. Lecoy, vol. 2, lines 16005–16118, Champion, 1965). His mouthpiece, the Lover-narrator portrays alchemy as an art superior to all others and this passage was often extrapolated from the rest of the Rose narrative and used as an independent treatise copied in numerous manuscripts containing scientific materials on alchemy. I will argue that the narrative genre of the dream vision and the theme of metamorphosis and regeneration create fertile ground (or matter) out of which Jean de Meun constructs his intertwining discourses of desire and of scientific knowledge. The metaphors used to depict the Lover's amorous quest to conquer the Rose is equally effective to express the alchemical process of transmutation. Using the theoretical approach of interdiscursivity, I intend to demonstrate that this passage detailing the process involved in alchemical transmutation allows for a semiotic symbiosis of the scientific or pseudo-scientific and poetic, in other words allegorical and metaphorical discourses in Jean de Meun's Rose. In fact, I will argue that it is precisely the ubiquity of alchemical symbolism that extends well past the passage on alchemy in his work that encouraged many of his contemporary and posterior readers to attribute to him the qualifications of the adept that he most likely was not. Geoffrey Chaucer, for example, seems to have used it as a source of inspiration for his Canterbury Tales in particular the Yeoman's Tale. It is my stance that Jean de Meun's comments on alchemy have provided contemporary and future writers and readers with a recipe on how to extrapolate the polysemy that is inherent in this seminal work of the French High Middle Ages which, in turn, informed the poetics of their own works.

Christine McWebb

French Studies, University of Waterloo

Christine McWebb is full professor at the University of Waterloo where she teaches at the Stratford School of Interaction Design and Business and the Department of French Studies. Professor McWebb's present research focuses mainly on the Digital Humanities and late medieval French literature and culture. She has published extensively on the late medieval French writer Christine de Pizan as well as on the Roman de la rose. Of particular interest are Christine de Pizan's sustained reactions to this work and the relation between text and iconography in late medieval literature. She published a critical anthology Debating the Roman de la rose: A Critical Anthology (Routledge 2007, repr. 2011) and is currently working on a monograph on the textual and iconographic discourse of alchemy in the Roman de la rose. Further, she is the director of the MARGOT project, which publishes in enriched digital form literary and iconographic materials from the French Middle Ages and the Early Modern Period. Her teaching includes courses on digital cultures, media history and innovation, medieval literature, cultural adaptations of scientific discourse, women writers in the Middle Ages, and translation. McWebb currently serves as the Director of the Stratford School of Interaction Design and Business at the University of Waterloo.

"Illusory chemistry": Analysis and Synthesis as Contested Models for Philosophical Thought in Eighteenth-century France

Jessica Stacey
Romance Studies, Freie Universität Berlin

Jessica Stacey is a Marie Curie Postdoctoral Fellow at Freie Universität Berlin. Her project RUSTEE (Rust and Revolution: Understanding Social Technologies in Enlightenment Europe) explores the history of material and metaphorical rust in the domains of political history, the history of science and technology, philosophy and poetics. Her first book, Narrative, catastrophe and temporality in eighteenth-century French literature, was published in 2022.

Rapid developments in eighteenth-century chemistry, popularized through public lectures and experiments, encouraged interest in analysis and synthesis as models for change in human objects like language and society, and for the operations of thought itself. For Voltaire, the analytic method suited man's humility, and supported deism against revelation: we might glimpse aspects of the nature of God by seeking what, in such an idea, is necessary to the functioning of the cosmos, but we could not pretend to synthesize a complete idea of the divine from scattered observations. But for the anti-philosophe Charles-Louis Richard, Voltaire's method – particularly as it was applied to Church history – was "specious analysis", in reality transforming the individual facts that it pretended to extract from complex events. Rousseau, meanwhile, tried – and apparently failed – to conceive of the difference between the properties of the body politic and the individuals who made it up by analogy with a chemical compound and its constituent elements.

Such discussions are part of crucial eighteenth-century debates over whether or not everything "real" is ultimately material. According to sensationist theories of knowledge, the most complex and abstract ideas were understood to be amenable, at least in theory, to analysis down to sense perceptions. However, such social entities as religion, tradition and hierarchy are, by the late eighteenth-century, understood to be imaginary objects: analysis, in breaking them down, leaves nothing with which to resynthesize them. Here, conservatives like Antoine Rivarol in France and Edmund Burke in England were in agreement with radicals. Where major disagreement arose was over the question of whether social institutions that could not survive this process should be discarded, or whether they should be understood to have a special status, protected from the destructive potential of analytic thought. Conservative thinkers who argued the latter suggested that radicals would see their own cherished ideals – human rights, compassion, and the body politic itself – fall to the 'dissolvants' they applied indiscriminately. Gathering sources that treat analysis and synthesis as philosophical operations from the mid-eighteenth century until the close of the French Revolution, this paper will endeavor to assess the extent to which such metaphors can be coherently applied, and the points at which coherence breaks down. Ultimately, it will ask whether chemistry offered a true model for thought in debates over the role of philosophy in society, or merely rhetorical ornamentation.

Physics as Paradigm: Light in Literary Adaptation as Seen in “Hamlet”

Emma de Beus
English Literature, Queen’s University Belfast

Emma de Beus is undertaking her PhD at Queen’s University Belfast. Her research focus is contemporary adaptation of Shakespeare. She holds postgraduate degrees from Columbia University and The Shakespeare Institute. Her work has been published in the peer-reviewed Humanities and LEA – Lingue e Letterature d’Oriente e d’Occidente.

In my thesis work, I apply Physics terminology to literary adaptation, arguing that adaptation is not one process, but a spectrum of processes which swerve into and away from each other, much as ancient philosophers considered atomic movement. Philosophers such as Democritus, Epicurus, Aristotle, and Leucippus coined the term atomos in their discussions of atomic theory; in Ancient Rome, Lucretius and Cicero developed the notion of clinamen atomorum: the swerve of the atom. These ideas grew in complexity and understanding through the Scientific Revolution, before being taken up by contemporary literary critics, such as Stephen Greenblatt and Harold Bloom, creating a throughline to contemporary scholarship.

I argue that there are five varieties of adaptation along the spectrum, each drawing on a different aspect of the physics of light: reflection, refraction, polarization, diffraction, and application. In reflected adaptation, this can mean cutting the source text, altering interpretations of dialogue and character, or condensing roles. In refracted adaptation, the source material is distinct and recognizable, but bends its constituent parts to accommodate the needs of the media form into which it is adapted. In polarized adaptation, one idea becomes the focus and is expanded upon. Diffraction in adaptation occurs when themes of source texts engage with one another to amplify meaning, but also diminish other aspects of the work. Application occurs when the preceding four terms are used in concert, pushing literary adaptations to the point where the source material is no longer directly discernible and their literary meanings function independently from the source.

My particular focus is on Shakespeare and in this paper, I will present Hamlet as a case study in how Physics methodologically illuminates the literary adaptive process, drawing on Simon Goodwin’s 2016 production of the play for the RSC as an example of reflected adaptation, 2016’s Hamik (a version of Hamlet, directed by Eunsung Kim and performed at the Seoul Metropolitan Theatre) as an example of refracted adaptation, Lisa Klein’s 2006 novel Ophelia–further adapted into a 2018 film version directed by Claire McCarthy–as an example of polarized adaptation, the 2011 film Mesnak (directed by Yves Sioui Durand) as an example of diffracted adaptation, and the 2020 film Promising Young Woman as an example of applied adaptation.

A Common Model for Fictional and Scientific Narratives

Ben Toth
Philosophy of Science, University of Lisbon

Dr Ben Toth is a Collaborator at the Centre for Philosophy of Science, University of Lisbon. His interests are integrated history and philosophy of science and the intersection of literary and scientific writing.

This proposed paper is offered in response to the questions of how narrative techniques are employed by science and what modelling techniques can be used to understand literary discourses. In it I describe a well-regarded but little used literary modelling technique, apply it to scientific writing, and argue that narrative is present in the same way and to the same extent in scientific writing as it is in fiction. The implications and challenges that arise are discussed. The correspondence between scientific and literary narrative exists on three levels:

Firstly, on the level of composition – sentences, grammar, punctuation. It is worth noting that literary works may include compositional elements normally found in scientific writing such as footnotes (The Waste Land), Illustrations (Alice in Wonderland), diagrams (la jalousie), photographs (Austerlitz), and algorithms (Conte-a-votre-facon).

Secondly, both use rhetoric to advance coherent and persuasive accounts. The Nobel Prize winning scientist Peter Medawar was identifying this level of correspondence when he claimed in 1962 that scientific papers were a type of fiction.

Thirdly – the subject of this paper – the narrative of both scientific and literary texts is generated by a shared model.

The first part of the paper describes S/Z, Roland Barthes' narrative generating model for literary fiction, and then applies the model to a recent peer reviewed scientific paper. Doing so indicates that the model works well for scientific text.

The second part of the paper addresses some of the implications and challenges that arise if literary and scientific texts share a common narratological structure.

Implications

If narrative exists everywhere in scientific writing it can be unproductive to analyze scientific texts as if they contain only regions of narrative. Nor does it add much understanding to say that scientific texts are similar to literary texts, or to transpose apparently literary devices such as fictives to scientific texts. Literary and scientific texts are equally subject to the same rules of narrative formation.

Challenges

The main challenge is that if scientific and literary writing are more alike than is generally envisaged, how should we account for their obvious differences? I will argue that the differences arise at the level of the circulation and application of texts rather than at the level of writing.

From Scientometrics to Criticometrics: Elaborating a Systemic Approach for Studying Literature through Metadata

Since 2008, based, on the one hand, on systems theory in social sciences (Even-Zohar 1990; Luhmann 2000; Wallerstein 2004) and, on the other hand, on the emergence of digital humanities and big data analytics (Mayer-Schönberger 2013, Schreibman 2016), we have been developing models aimed at studying cultural dynamics and mapping world literature.

Inspired by scientometrics (Price 1963; Small 1973; Leydesdorff 1998) – the discipline dedicated to measuring and analyzing the activity in science and technology –, we established an analogy to create an approach that would allow us to measure the activity of the critique in the arts: criticometrics (Ferrer 2011, 2018). Initially developed by Price (1963), scientometrics owes its existence to the instruments developed by Eugene Garfield, founder of the Institute for Scientific Information. Thus, to develop criticometrics, we adapted scientometric tools to the reality of the bibliographic databases in the arts. Specifically, we use descriptive indicators for measuring the volume of critical activity, and relational indicators to reveal the interactions between the agents that participate in the field. For instance, the keywords method (Callon 1993) allowed us to extract the metadata of the references related to national literatures, movements, writers, etc. Also, we adapted the theories of cocitations (Small 1973; Leydesdorff 1998), to reveal the relations between writers, literary works, and so on.

With the purpose of illustrating the results yield by criticometrics, in this paper we will analyze the European literary system. Firstly, we will extract the metadata from the main database in literary studies, the Modern Language Association International Bibliography. The sample includes 1,272,000 references, published from 1850 to 2018, and covers 49 national literatures. Secondly, we will elaborate geopolitical, chronological, and linguistic indicators, and we will deploy the names of the principal writers, literary works, and periodicals. Finally, we will select a set of 20 writers, and through the analysis of cocitations, we will identify the relations between them and other writers. All these indicators will allow us to achieve a better understanding of the dynamics of the European literary system.

Criticometrics moves away from the traditional top-down literary studies viewpoint and establishes a bottom-up perspective. Moreover, it constitutes a way of creating new knowledge – based on the law of large numbers – through the analysis of thousands of publications carried out over several decades by the international academic community. Consequently, we will refer to the epistemological changes brought by criticometrics to the study of the arts.

Carolina Ferrer

Département d'études littéraires, Université du Québec à Montréal

Carolina Ferrer's research focuses on the new observables of the digital age – particularly in literary studies – the circulation of concepts, the relationship between literature and science. She works on the literary canon and prizes, the diffusion and reception of the work of writers, the evolution of contemporary literary movements and styles and the constitution of national literatures. She develops, from a metacritical perspective, models aimed at studying cultural dynamics and mapping world literature.

Callon, Michel, Jean-Pierre Courtial et Hervé Penan. La Scientométrie. Paris: Presses universitaires de France, 1993.

Even-Zohar, Itamar. "Polysystem Theory." Poetics Today 11 (1990): 1–268.

Ferrer, Carolina. "El boom hispanoamericano: del texto a la pantalla." Nuevas aproximaciones al cine hispánico: Migraciones temporales, textuales y étnicas en el bicentenario de las independencias iberoamericanas (1810– 2010), Barcelona: Promociones y Publicaciones Universitarias, 2011, 79–101.

Ferrer, Carolina. "Les études littéraires à l'ère de la mondialisation: traces et trajets au prisme des nouveaux observables numériques." Zizanie 2.1 (2018): 76–101.

Leydesdorff, Loet. "Theories of Citation?" Scientometrics 43.1 (1998): 5–25.

Luhmann, Niklas. Art As A Social System. Stanford: Stanford University Press, 2000.

Mayer-Schönberger, Viktor and Kenneth Cukier. Big data. A revolution that will transform how we live, work, and think. Boston and New York: Houghton Mifflin Harcourt, 2013.

Modern Language Association International Bibliography. www.mla.org

Price, Derek de Solla. Little Science, Big Science. New York: Columbia University Press, 1963.

Schreibman, Susan, Ray Siemens and John Unsworth (dir.). A New Companion to Digital Humanities. Malden: Wiley and Sons, 2016.

Small, Henry. "Co-citation in the Scientific Literature: A New Measure of the Relationship Between Two Documents." Journal of the American Society for Information Science 24 (1973): 265–269.

Wallerstein, Immanuel. World Systems Analysis: An Introduction. Durham: Duke University Press, 2004.

Models and Diagrams in Literary Research – Close Reading versus Distant Reading in Digital Humanities on the Example of Ekphrasis and Nocturne

The paper focuses on the issue of close reading and distant reading as two forms of epistemic strategy for the study of cultural production. The two methods of approaching texts are two ways of analyzing and interpreting them. A comparison of the results of such a twofold search would yield interesting conclusions, show the strengths and weaknesses of both approaches, make us aware of the existing perspectives of literary research and the paths opening up.

The first approach is rooted in methodologically traditional literary research, related to the careful interpretation of a text, i.e. the personal and precise reading of a specific text, tracking details and nuances of meaning, taking into account closer and further context, analyzing linguistic features. The second is associated with digital humanities, for which the quantitative analysis of large corpora of texts is applicable, as well as the creation of models and graphs/maps, which are the result of this analysis and at the same time a scientific conjecture about the given, researched phenomenon/theme.

The similarities and divergences of the two approaches (personal analysis of the form and meaning of the text vs. the work of computer algorithms and quantitative research) will allow to formulate interesting conclusions about the usefulness, effectiveness, innovation of the methods of digital humanities and the models it creates, and will enable to see what interpretative problems arise in relation to the materials explored.

A selection of contemporary literary and essayistic works from the Italian and Polish cultural milieu will be analyzed. Fragments of literary and essayistic ekphrases (by authors such as Tabucchi, Anedda, Mazzucco, Herbert, Grudziński, Karpiński) will be examined, including those that can be described as nocturnal ekphrases or ekphrases-nocturns.

The paper seeks to address the question of whether a model of ekphrastic text can be created and whether it can be translated into a set of specific words, themes, as well as linguistic, grammatical and stylistic features that are capable of being retrieved (and subsequently visualized) by computer software (computational text analysis). It is thus also a question about the possible advantages of digital scholarship and techniques over traditional ones in literary studies.

Rozalia Słodzyk

Institute of Polish Language, Polish Academy of Sciences, Cracow

Currently employed at the Methodological laboratory of the Institute of Polish Language (Polish Academy of Sciences) in Krakow. She graduated from the University of Warsaw (triple MA in Polish Studies, Art History and Italian Studies), and in 2018 she defended her PhD in literary studies with distinction. She is the author of the book Ekphrasis, Hypotyposis, Translation. Interferences of Literature and Painting in 20th Century Italian Prose and Polish Essayism (Krakow 2020). Her areas of interest include intertextual and intersemiotic relations between literary texts and between literature and other areas of artistic creation (painting, music, film), theory of art and literature, and the issue of translation. She has also been interested in the field of digital humanities for some time and in her postdoctoral research she would like to juxtapose the traditional methodology of close reading with corpus-based quantitative research in the vein of distant reading. The subject of her research is the topic of cross-domain genres, starting with the nocturne, along with the form of ekphrasis, analyzed in the field of mainly Polish and Italian literature, as well as English and German.

She is in addition a proofreader and occasional translator. She lectures students (formerly at the University of Warsaw and at the Eberhard Karls University of Tübingen, currently at Cardinal Stefan Wyszyński University in Warsaw) and was a teacher of Polish as a foreign language. She also writes reviews of books and exhibitions.

Denoising Futurisms: Modeling Algorithmic Avant-Gardes

Daniel Raschke

Literature, Media, Culture at Florida State University

Daniel Raschke is a PhD Candidate in Literature, Media, Culture at Florida State University. He received his MA in American Studies from Johannes Gutenberg University Mainz, Germany. His research focuses on transatlantic modernisms, cybernetics, and media theory. In his dissertation project, Denoising Modernism, he traces the codifications of observational entropy and mediation in literary modernism. His work has appeared in Understanding Flusser, Understanding Modernism, Affirmations, and elsewhere. His book translation of Flusser's Bochum lectures is forthcoming with Univocal.

"Noise, Noise, Noise – the greatest disease-vector of civilization," J.G. Ballard wrote in the 1960 short story "The Sound Sweep." In this dystopian society, noise functions as a nuisance to be completely irradicated – to the complete misery of its inhabitants stuck in loops of similitude. Noisiness in evocations of modernity is certainly nothing new; even in the early modern Shakespeare's Macbeth the witches emphasize the omnipresent, human-made "hurlyburly" that leads to neither loss nor victory. But the concept embedded in a vector, as in Ballard, emphasizes that noise might be modelled, controlled, and channeled as is now common practice in digital noise filtering, image reproduction, and remediation. An intriguing connection between sonic and image writing-as-rendering qua noise, I suggest, can be found in the early twentieth-century European avant-garde. Drawing on recent critical assessments of noise by Paul Hegarty (Annihilating Noise, Bloomsbury, 2020) and Cecile Malaspina (Epistemology of Noise, Minnesota UP, 2018), this paper analyzes three proto-modernist avant-gardes (Italian Futurism, Cubo-Futurism, and Vorticism) with specific focus on their algorithmic engagement with noise. I argue that not only were they interested in employing auditory noise to disrupt the literary establishment through onomatopoeia, transrationality, and blastings and blessings, they specifically approached noise as an information conundrum that could be algorithmically channeled to manifest the future of the arts via continuous ontological renewal.

Even though all three movements had different foci and emphasized varying techné, ranging from radical calamitous recycling, machinic noise-making intonarumori, to word-formation nonsense, and re-assembling vortices, they all approached noise in a computational model that would first manifest noise, followed by outlining denoising processes that would continuously manifest noise as potential, future information to be perceived and processed by their virtual successors. In their conceptualization of algorithmic noise cartography, avant-gardists drew on noise as a phenomenological cultural problem to be reconfigured via technological solutions. In this proto-cybernetic framework, through order-from-noise as Heinz von Foerster would frame it, future novelty would be guaranteed as futurism would rewrite itself autopoietically. "Make it new," Ezra Pound's famous modernist dictum, demands a transformative engagement with the noise of modernity.

Using close readings of representative futurist manifestos by F.T. Marinetti and Luigi Russolo, Aleksei Kruchenykh and Velimir Khlebnikov, and Wyndham Lewis and Ezra Pound, I highlight their use of channeling metaphors, outline their noising and denoising methodologies, and explore their failures in totalitarian modeling.

“I had found my model of replication”: Analogy and Musical Signification in Richard Powers’s “The Gold Bug Variations"

“Analog[ies],” writes Lawrence Zbikowski, “can be conceived of as a reasoning process based on an apprehended match in relational structure between two apparently different objects or phenomena.”By virtue of their conceptual gap-filling quality, analogies function as tools that nurture and broaden our epistemic horizons – indeed, it can be suggested that concepts themselves “are nothing but a tightly packaged bundle of analogies.” Whether we use analogies to match a standard, situational token with a more abstract type, or metaphorically map an object onto something else in a more or less creative manner, analogies stimulate correspondences between different fields of knowledge and experience; in other words, they shape our understanding and interpretation of reality. Drawing on these premises, this study aims to explore the reliance of musical meaning-making processes on analogical reasoning in Richard Powers’s The Gold Bug Variations. Structurally and thematically modeled on Bach’s Goldberg Variations, Powers’s philosophical novel focuses on Dr. Ressler’s mission to crack the secret language of DNA, thus establishing fascinating connections between genetics and (classical) music. Taking as its starting point the protagonist’s scientific – and analogic – epiphany that the Goldbergs’ introductory aria “separated like an independent filament of DNA”, I argue that music is employed in the novel as a discourse that possesses the ability to signify something other than itself. Not only does music act as a unifying, structuring principle at the level of discourse; it is also diegetically incorporated as a non-verbal phenomenon whose interpretive affordances most of the characters intellectually and affectively engage with. Contrary to formalist beliefs that music does not have the capacity to reference external signifieds, The Gold Bug Variations effectively illustrates that music simultaneously elicits aesthetic contemplation of semantically self-sufficient sonic forms, and, more importantly, acts as a catalyst for cross-modal and cross-disciplinary cognition.

Stefano Franceschini

American Literature, Roma Tre University

Stefano Franceschini is a PhD student at Roma Tre University. His doctoral project – “What Does That Tune Mean?”: Phonosemiosis and Heteromediality in Richard Powers’s Novels – seeks to examine the interconnection between meaning, music, and sound in the works of Richard Powers, with a focus on the musicality of the novels The Gold Bug Variations (1991), The Time of Our Singing (2003) and Orfeo (2014). In 2021 the Italian Association for North American Studies (AISNA) awarded him the “Caterina Gullì” prize for his MA dissertation on H. P. Lovecraft’s cosmicist tales, A New Supernatural Literature: Cosmic Art and Parascience in H. P. Lovecraft’s Fiction (Roma Tre University). He is currently the recipient of the “Ernst Mach Grant – Worldwide”, a scholarship financed by the Austrian Federal Ministry of Education, Science and Research. He is a member of AISNA and of the scientific committee of the Center for American Studies in Rome. He has published articles and reviews on H.P. Lovecraft, Ambrose Bierce, and Richard Powers. His research interests include intermediality, Gothic and weird fiction, semiotics, and philosophy of music.

Accuracy in Imagining

The idea that imagination should be thought of as a skill has in recent years become increasingly common in philosophy of imagination. If we accept this idea, then it seems to follow that different people will be better at imagining than other people and, correspondingly, that some particular imaginings are better than others. But what factors are we evaluating when making a judgment on this score? While there are undoubtedly many dimensions along which one imagining might be said to be better than another, in this paper I focus on just one such dimension: Accuracy. What does it mean for one imagining to be more accurate than another? After first explaining when and how accuracy isrelevant in imaginative contexts, I give an account of accuracy that connects it to imaginative aim. As we will see, this account of imaginative accuracy proves important in thinking about imagination in a variety of contexts including thought experimentation, modeling, andsimulation.

Amy Kind

Philosophy, Claremont McKenna College, Cali-fornia

Amy Kind, the Russell K. Pitzer Professor of Philosophy, joined the CMC faculty in 1997. Currently the Director of the Gould Center for Humanistic Studies, she has previously served as Chair of the Department of Philosophy (2009 – 2012) and Associate Dean of the Faculty (2005 – 2008). At CMC, she teaches classes in philosophy of mind, metaphysics, and logic. Her research interests lie broadly in the philosophy of mind, though most of her published work has concerned issues relating either to imagination or to phenomenal consciousness. Her monograph in the Cambridge Elements in Philosophy of Mind series, Imagination and Creative Thinking, was published in 2022. She has edited or co-edited four volumes: Epistemic Uses of Imagination (co-edited with Christopher Badura), Knowledge Through Imagination (co-edited with Peter Kung), The Routledge Handbook of Philosophy of Imagination, and Philosophy of Mind in the Twentieth and Twenty-First Centuries.She has also written introductory textbooks on Persons and Personal Identity (Polity Press) and Philosophy of Mind: The Basics (Routledge).

For more information, see her Google Scholar profile and her personal website.

Imagine that, Kant: Crossdisciplinary Work on Awe and the Sublime

Using the format of a brief presentation, I would like to approach the question in the conference description: “What interpretational problems arise due to crossdisciplinary approaches and different textual, diagrammatical, algorithmical and encoding practices?” In particular, I wish to focus on the problems of interpretation of a core concept in aesthetic theory (the sublime, il sublime, das Erhabene) into researches in another field, empirical psychology (“awe”), and vice versa.

As a scholar in the humanities and philosophy, I would discuss my experiences engaging in interdisciplinary work, reviewing some of the challenges and successes we encountered (Clewis et al. 2021, Chirico et al. 2020). To put it another way, I will discuss models of the sublime (Clewis 2021) and how they have been used in awe research, that is, how the concept of the sublime has functioned as a model to guide such research. I will also note how and to what extent the “sublime” has been ignored in “awe” research, perhaps due to disciplinary reasons.

Connecting to work in philosophy of mind and aesthetics, I also wish to discuss “metaphor” as used in some aesthetic theories. I address the expansion of the imagination in several theories of the sublime (2019), including but not limited to the theory proposed by Immanuel Kant (1790). This would connect up with how “the philosophy of mind explores epistemic uses of imagination.” How, and to what extent, is the “expansion” of imagination in the sublime to be taken as a metaphor? If, to take Kant’s theory in particular (1790), it is not a real empirical description of the actual workings of the mind, how is such an enactment or activity in transcendental psychology to be understood? I note that similar questions about the “free play” (freies Spiel) in beauty, qua metaphor, can also be raised.

Robert Clewis

Philosophy, Gwynedd Mercy University, Pennsyl-vania

Robert R. Clewis is professor of philosophy at Gwynedd Mercy University and director of the Institute for the Study of Aesthetics and Its History. He is the author of The Origins of Kant’s Aesthetics (Cambridge University Press, forthcoming early 2023), Kant’s Humorous Writings: An Illustrated Guide (Bloomsbury, 2020), and The Kantian Sublime and the Revelation of Freedom (Cambridge University Press, 2009). He edited the first comprehensive, historical anthology on the sublime, The Sublime Reader (Bloomsbury, 2019). He translated the 1784/85 lecture in Kant’s Lectures on Anthropology (Cambridge University Press, 2012) and edited Reading Kant’s Lectures (Walter de Gruyter, 2015). His research has been supported by the Alexander von Humboldt Foundation and the American Council of Learned Societies, and he has been a visiting scholar at the Max Planck Institut für Empirische Ästhetik (with Winfried Menninghaus), Ludwig-Maximilians-Universität München, and the University of Pennsylvania.

Modelling the Energy Lab 2.0

The Blind Spots of Modelling: Models in Arts and Science

Models and Metaphors: A Topological Turn

Literary Modelling and Energy Transition. A Transdisciplinary Venture

Veit Hagenmeyer
Institute for Technology Assessment and Systems Analysis Karlsruhe

Tobias Becker
Architecture, Siegen University

Eric Achermann
German Studies, University Münster

Matthias Erdbeer
German Studies, University Münster

Robert Matthias Erdbeer is the research coordinator of the LMET Research Group 'Literary Modelling and Energy Transition', a transdisciplinary project at the University of Münster and the KIT in Karlsruhe, Germany, funded by the Volkswagen Foundation. He studied German Literature, History and Philosophy at the Universities of Tübingen, Dublin, and Berkeley, received fellowships from IFK Vienna, CAS Sofia, and NEC Bucharest, and was a Max Kade Distinguished Visiting Professor at the University of Illinois. His research interests cover Literary Form and Modelling, Digital Literature and Gaming, Natural Philosophy in Science, and the Historical Avant-garde.

Eric Achermann is a professor for German Literature with key areas in Early Modern Literature and History of Knowledge at the University of Münster. He is also the Dean of the Faculty of Philology. He studied Ancient Greek and German, completed his Ph.D. in German Literature at the University of Berne, Switzerland, and was a scholar in a research programme funded by the Swiss National Science Foundation. His research interests cover a wide range of topics in Early Modern European Literature and History of Science (from the Renaissance to the Enlightenment), as well as in Theory of Literature and Science.

Veit Hagenmeyer is currently Professor of Energy Informatics with the Faculty of Informatics, and the Director of the Institute for Automation and Applied Informatics at the Karlsruhe Institute of Technology, Karlsruhe, Germany. His research interests include modeling, optimization and control of sector-integrated energy systems, machine learning based forecasting of uncertain demand and production in energy systems mainly driven by renewables, and integrated cyber-security of such systems.

Tobias Becker studied fine arts at the University of the Arts in Berlin, the Willem de Kooning Academy in Rotterdam and the University of Illinois, Urbana-Champaign, Illinois, USA. After teaching at the TU Berlin, RWTH Aachen and the HfG Karlsruhe, he took up the professorship for design and design theory, Department of Architecture, University of Siegen in 2021. Tobias Becker deals with the perception and construction of space and strategies of spatial localisation in the media of object and model construction, painting, photography and cartography. Since 2005 he has been exhibiting at home and abroad. He is a member of the Art Advisory Board of the City of Cologne as well as Chairman of Opekta Ateliers (Opekta e.V.), Cologne.

Biological Phenomena in Search of a Mea-ning: The Concept of Brain Plasticity as a Back-and-Forth Between Biology, Politics and Culture

Sébastien Lemerle
Sociology, Université Paris-Nanterre

Lecturer in sociology and communication studies at the Université de Paris-Nanterre, France

Member of Centre de recherches sociologiques et politiques de Paris: https://www.cresppa.cnrs.fr/csu/equipe/les-membres-du-csu/lemerle-sebastien/

Brain plasticity has been an expanding topic of research since the last third of the 20th century, to the point that the word “plasticity”, a concept first coined in aesthetics, material sciences and psychology in the 19th century, is more and more associated to the idea that brain is molded by environmental influences through the lifespan (Pascual-Leone 2005). Plasticity is today mainly seen as an intrinsic property of the nervous system and as such it can be found in a vast array of academic literature (neuroscience, neurology, psychiatry, psychology and so on), which deals with the fact that “changes in neural organization may account for various forms of behavioral modifiability, either short-lasting or enduring, including maturation, adaptation to a mutable environment, specific and unspecific kinds of learning, and compensatory adjustments in response to functional losses from aging or brain damage.” (Berlucchi and Buchtel 2009).

Surprisingly, the concept has been deemed problematic almost from the very beginning of its scientific revival, mainly because of its metaphoric dimension (Paillard 1976). Whereas one could also consider this as a good example of the conceptual metaphors which have been historically so important in life science (Boyd 1993; Fox Keller 1995, 2002), plasticity nevertheless seems to have an ambiguous epistemic status. This ambiguity lies in a kind of vagueness which is not uncommon when it comes to scientific theorizing (Neto 2020) and which can also explain the reason of its appeal far beyond academic boundaries. For instance, in French-speaking countries, by diffusing in heterogenous social spaces (the media, the intellectual field, the entertainment industry, and so on), the notion of plasticity has turned into a popular catchword directed against biological determinism and grounding the celebration of the fundamental freedom of the human condition, its capacity for emancipation (Peschanski 1993; Malabou 2004, 2009; Vidal 2010; Vincent and Lledo 2011; Vidal 2015). This renewed vision of plasticity can even affect some neuroscientists’ view of their own work in return.

Based on ongoing research, this paper intends to introduce a study of this back-and-forth between biological theorizing, culture and politics. It will especially focus on the way the metaphorical background of plasticity has been appropriated by various philosophers and essayists (Malabou 2000), how it fits in popular science narratives and how it has even influenced the aesthetics of several theatrical shows displayed in France and Belgium in the last decades (Prochiantz and Peyret 2002, 2005; Juilliard 2015; Confino 2017).

Of Brains in a Dish and Mini-Brains – Cerebral Organoids, Scientific Models and the Ethical Implications of Metaphors

Joachim Peters
German Linguistics, University Erlangen-Nürnberg
Katharina Trettenbach
Ethics of Medicine, Tübingen University

Katharina Trettenbach has a background in biochemistry, psychology, neuroscience and medicine. Based at the Institute for the Ethics and History of Medicine at Tübingen, she has been pursuing doctoral research in medical ethics since 2020 with a dissertation project on ethical challenges of translational research. In addition, Katharina works at the Junior Professorship for Medical Ethics at the University of Potsdam. Reflecting her biomedical and bioethical interests and training, her research interests span questions in neuroethics and the ethics of (bio)technologies, the philosophy of medicine as well as the ethical dimensions of research communication.

Background

For several years now, (human) cerebral organoids have been used to elucidate features of brain functioning in a model more advanced and intricate than previously developed tissue cultures, increasingly gaining mainstream media attention.

However, with public attention come concerns about how (not) to communicate the nature of cerebral organoids to public audiences. E.g., Members of expert communities have traditionally been wary, and publicly so, of the framing of cerebral organoids as purported “mini brains”, citing the term´s potential for confusion and for raising unfounded expectations about their nature and scientific potential, with public imaginaries of cerebral organoids as the proverbial “brain(s) in a dish” at the more problematic end of portrayals.

Methods

Based on the strings "mini brain*" cerebral, "mini brain*" organoid and "mini brain*" cell*, a corpus of English-language web texts (2013–2023) was created from data from the CommonCrawl corpus. An empirical analysis of the semantics of word and sentence environments was then carried out.

Collocation calculations, semantic networks and word field analyzes enabled conclusions to be drawn about changes in the media representation and perception of the cerebral organoids in newspapers and popular scientific internet portals. The collocations were calculated using the effect size measure log ratio confidence interval (LRC), which is implemented in the analysis software CQPweb (v 3.1.7; Evert, Dykes & Peters 2018). The empirical analysis was supplemented with manual analyzes of the metaphors and grammatical agent, the thematic relation of the cause or initiator to an event, in the texts examined. Metaphors were identified using end-to-end metaphor identification models (Mao et al. 2019).

Results

Analysis of metaphors and grammatical agents shows that cerebral organoids are inappropriately portrayed as acting subjects and partially humanized, which contradicts their actual character as scientific models. It is particularly striking that cerebral organoids are often portrayed as grammatical agents in popular scientific texts.

Conclusions

The portrayal of cerebral organoids as acting subjects hints at problematic assumptions about the ontological nature of cerebral organoids and touches on fundamental epistemological questions in areas such as philosophy of mind and philosophy of (neuro)science and consequently fields such as neuroethics investigating the ethical ramifications of these questions. We conclude that its scholars must take heed from metaphors in popular media outlets, address metaphors in research communication, as well as aim to communicate relevant controversies and uncertainties in the philosophy of neuroscience for neuroethics to stay clear of “hype and hyperbole” (Dubljević, Trettenbach, & Ranisch, 2022) in interactions with publics.

Evert S, Dykes N & Peters J (2018) A quantitative evaluation of keyword measures for corpusbased discourse analysis. Corpora and Discourse International Conference. Lancaster http://www.stefan-evert.de /PUB/EvertEtc2018_CAD_abstract.pdf

Mao R, Lin C, Guerin F (2019) End-to-end sequential metaphor identification inspired bylinguistic theories. In: Proceedings of the 57th annual meeting of the association for computational linguistics, 2019, pp 3888–3898

Dubljević V, Trettenbach K & Ranisch R (2022) The socio-political roles of neuroethics and the case of Klotho. In: AJOB Neuroscience, 13(1), pp 10-22

The Insatiable Rat

Otniel E. Dror

Medical Anthropology, Hebrew University of Jerusalem

Otniel E. Dror, MD, Ph D in history, is a faculty member at The Hebrew University of Jerusalem. He specializes in the cultural history of the modern Western life sciences and medicine (19th–21st centuries). His research focuses on the history of the study of emotions in the Western life sciences during the nineteenth and twentieth centuries. He co-edited Knowledge and Pain (Brill) and History of Science and the Emotions (Chicago). His monograph, Blush, Flush, Adrenalin: Science, Modernity and Paradigms of Emotions, 1850–1940, is under revision for the University of Chicago Press. His publications have appeared in Emotion Review, Isis, Science in Context, Social Research, Osiris, and more.

“Recently discovered is a region [in the brain]…which on stimulation gives rise to a strongly pleasurable sensation. …Evidently all the desirable things in life are desirable only insofar as they stimulate the pleasure center. To stimulate it directly makes all else unnecessary. ” Isaac Asimov, 1965

In 1954, James Olds and Peter Milner discovered “super-pleasure” in the brain of a laboratory rat. The discovery of super-pleasure in the brain inaugurated a major transformation whose repercussions and off-shoots are very much still with us today, including the development of a neurophysiology of decision making, risk taking, addiction, affective neuroscience, and more [sic]

In my presentation, I will focus on the first decade or decade and a half following the discovery of the new “supra-maximal” “super pleasure” in the brain. I will reconstruct the laboratory enactment that constituted this new pleasure as “supramaximal,” instant, and insatiable.

This laboratory enactment and model entailed a "looped" rat, which insatiably self-stimulated its own "pleasure center" in the brain (see picture above). I will examine how “pure” “supramaximal” “super-pleasure" was a product of experimental enactments and the rat model. I will study several implications of the discovery that our brains were wired for a super-pleasure that was off-the-grid, perpetual, and insatiable.

I will argue that the extreme excessiveness of the newly-modeled insatiable super-pleasure challenged existing models of organisms, of the self, and of nature and society. It revolutionized the moral, economic, and social order by presenting a super-pleasure that disrupted the “necessary” balance between pleasure and pain. Pleasure, in this new model, was a “positive feedback loop” that disrupted the felicity calculus and the “invisible” hand. I will suggest one major post-war context that situates the new super-pleasure. More specifically, I will argue that the relationships between consumption-affect-drive had shifted from an economy of scarcity, deprivation, and food-rationing to a post-war political and experimental economy of abundance and consumption. In this new economy, satiated humans were driven insatiably to consume, satiated rats inside laboratories were driven insatiably to “self-stimulate” their pleasure centers, and science discovered that our brains were wired for an insatiable super-pleasure.

My presentation focuses on developments in1950s and 60s United States. It draws on primary and archival materials and on interviews with several of the individuals who participated in this revolution.

Adaptive Landscapes as Metaphors and Models

Johannes Müller
German and Literary Studies, Leiden University

Johannes Müller is assistant professor of German and Literary Studies at Leiden University. Among his research interests are the history of knowledge and knowledge transfer, environmental history and human-nature interactions.

The concept of adaptive and fitness landscapes is one of the most influential metaphors in evolutionary biology. Introduced in 1932 by geneticist Sewall Wright (as fitness landscape), the model was later extended from genotypes to phenotypes and it inspired related metaphorical concepts, among which the idea of "morphospaces" that describes the range of morphological possibilities an organ or organism could potentially produce.

The last two decades have seen renewed controversial debates about the heuristic value of evolutionary landscape concepts. Jonathan Kaplan has proclaimed "the end of the landscape metaphor", while others, for example George R. McGhee in Geometry of Evolution, argue that the adaptive landscape concept can even transcend the metaphorical realm and serve as an actual analytical heuristic in modeling approaches. Reappropriating the landscape model in the context of theoretical morphology, McGhee and others use it to model and analyze convergent evolution and related phenomena (sometimes without "fitness" as the third or vertical dimension).

In this paper, I propose to take the metaphorical character of the adaptive landscape model serious and to explore its explanatory potential when it is explicitly treated as a metaphor. This approach reveals a number of unexplored aspects of the model, in particular the question of non-adaptive features as well as scenarios of maladaptation. Reading adaptive landscapes as metaphors might provide crucial insights into such phenomena: if optimal fitness is represented as a "peak" in a landscape, a metaphorical reading has to assume certain costs that are involved in "climbing" such a peak (since the landscape metaphor implies a gravitational force that makes climbing more costly than descending). These costs have rarely been addressed but they allow for a better understanding of why the highest peaks are not always realized or only climbed "halfway".

To illustrate the heuristic value of an explicit metaphorical reading of the landscape model, I will apply it to the body of recent biological literature on temperature-induced size reduction in ectothermic animals and the debate on the extent of which organisms and populations can adapt to rapid climate change. Taking the "costs of climbing" (analogous to Haldane's "cost of adaptation")into account, I will address the adaptive and non-adaptive factors that are involved in the phenotypical modifications of ectothermic (especially aquatic) organisms that are exposed to thermal stress. As I argue, taking landscape models serious as metaphors might provide important insights into the impact of global warming on aquatic ecosystems.

Modelling and Imagining ‘Tipping Points’

Lilian Kroth

French Literature, University of Cambridge

Lilian Kroth is currently a doctoral researcher at the University of Cambridge and works on a project on Michel Serres's philosophy of limits. Her research examines conceptual translations of limits and boundaries between the philosophy of science, aesthetics, and critical theory. She is associated with the Centre Marc Bloch in Berlin and one of the organizers of the research network “Remote Sensing. Ice, Instruments, Imagination” at CRASSH, Cambridge. Lilian previously studied Philosophy (University of Vienna) and Fine Arts (University of Fine Arts in Vienna). She has contributed to a number of theater projects and various group exhibitions.

Both the academic and the public discussions of climate change rely extensively on the language of thresholds, borders, limits, and boundaries. These are, to various degrees and in different ways, arguably shaped by imaginations, metaphors, and narratives. Analysis of the operative functions of ‘liminalisms’ in these respective discourses will thus offer a theoretical clarification of their genealogies, their aesthetic aspects, and their role in communication and miscommunication. Which disciplinary background do certain understandings of limitations, thresholds, tipping points etc. emerge from, and how do they, as ‘operators’, transgress into other realms, to frame the possibilities and impossibilities of thinking climate change?

With these questions in mind, this paper will focus on the theme of ‘tipping points’ in climate science. The understanding and rhetorical use of tipping points requires a thorough perspective in respect to the transdisciplinary translations taking place. Depending on their definitions, there are for example important differences in regard to ‘irreversible’ or ‘reversible change’, which can lead to semantic confusions when using tipping points as a concept. Tipping points are a prime example of a notion in which the “interplay between its popular connotations and history of technical usage” is manifold and complex, and requires careful tracing of the relevant mathematical and metaphorical origins, entailing for example a deeper understanding of dynamic systems theory and its metaphorization (Russill 2015). Until the 2000s, ‘tipping point’ was used in a rather undefined and ‘alarming’ manner, before being mobilized as a scientific concept across scales and becoming central to climate policy (Lenton & Schellnhuber, 2007, IPCC 2021). Cryosphere tipping points in particular, and their consequences for melting ice, biosphere boundaries, sea-level rise, flooded territories (IPCC 2019; Alley 2000; Lindsay & Zhang 2005; Holland & Bitz 2006; Winton 2006) demonstrate the intersection between different climate discourses speaking in the language of liminalisms. A conceptual survey of tipping points is crucial to understanding crucial role of framing limits and its historical and contemporary impact.

Through the genesis of imagining and modelling of ‘tipping points’ this paper aims to address the exchange between discourses and practices of knowledge production, and highlight the role of rhetorics and imagination in both the scientific definition of the context as well in its role for public policy.

Probability and the Analogical Participation of Models in Intersubjective Goods

This paper demonstrates how scientific concepts originate, as meaningful and ethically normative through a process of idealization and metaphor, with the important case of the origin of probability as our guide.

Probability arose in the late 17th century in Europe, with no historical precursors.Traditional history and philosophy of science treats this historical event as the discovery of the objective existence of randomness, and the primary concern of philosophy of statistics, accordingly, is whether randomness exists in objective reality or in the mind.More recent histories, however, uncover how randomness was originally a metaphor of a random lottery, idealized from its original intersubjective meaning within gambling contracts and then applied to all other aleatory contracts in the civic and economic realms, so that the latter may be practiced through reasonable agreement free of the conflict associated with 17th century Europe.

The origin of probability not only shows a third way through the objectivist-constructivist debates on the origin of scientific concepts, it also challenges the instrumentalist conception of scientific concepts by disclosing such concepts as analogically oriented towards an intersubjective good. This paper grounds this analogical nature of scientific concepts such as probability first in Aristotle, for whom technical reasoning analogically participates in phronetic perfections, and second in Husserl, for whom the idealization, sedimentation and desedimentation of scientific concepts manifest one's self-responsibility or evasion of such responsibility.

The history of probability and statistics, of its promise and its harms from eugenics to the replicability crisis of science to artificial intelligence, is thus explicable as a history of the life and death of its central metaphor of randomness: a history of using an idealization from one domain as a metaphor to understand another domain, and then dogmatically insisting it's not a metaphor and inauthentically reducing the target domain to the sedimented abstraction.

Ken Archer

Philosophy, Head of AI Ethics at Twitch

Ken Archer received his M.A. in Philosophy at the Catholic University of America and his B.A in Political Philosophy from Tufts University. He currently leads AI Ethics at Twitch, a division of Amazon, and is beginning a PhD in Philosophy in 2023.Archer has presented at conferences on AI Ethics, Aristotle and Technology, Heidegger and Technology and philosophy and ethics of technology.

1. History of Probability
Bernoulli, Jacob, The Art of Conjecturing
Daston, Lorraine, Classical Probability in the Enlightenment
Ferreiros, Jose, Mathematical Knowledge and the Interplay of Practices
Franklin, James, The Science of Conjecture: Evidence and Probability before Pascal
Gigerenzer, Gerd, et al, The Empire of Chance
Keynes, John Maynard, A Treatise on Probability
Klein, Jacob, Greek Mathematical Thought and the Origin of Algebra
Knight, Frank, Risk, Uncertainty and Profit
Kruger, Lorenz, et al, The Probabilistic Revolution
Weisberg, Herbert I., Willful Ignorance

2. Metaphor in Science
Black, Max, Models and Metaphors
Dear, Peter, Discipline and Experience (U of Chicago Press: Chicago, 1995), Ch 6
Hesse, Mary B., The Structure of Scientific Inference
Holton, Gerald, The Scientific Imagination
Lakoff, George and Johnson, Mark, Metaphors We Live By
Schon, Donald A., The Displacement of Concepts
Wallace, William, The Modeling of Nature

3. Aristotle on Analogy in Techne, Episteme and Phronesis
Angier, Tom, Techne in Aristotle's Ethics
Aristotle, Nicomachean Ethics, De Anima, Rhetoric and Topics
Hippocrates, On Techne
Plato, Theaetetus, Gorgias and The Laws

4. Husserl on Idealization and Responsibility
Dodd, James, Crisis and Reflection: An Essay on Husserl's Crisis of the European Sciences
Husserl, Edmund, The Crisis of the European Sciences
Husserl, Edmund, Formal and Transcendental Logic
Husserl, Edmund, Husserliana 13–15: Zur Phänomenologie der Intersubjektivitat
Husserl, Edmund, Husserliana 27: The Kaizo articles
Patocka, Jan, The Natural World as a Philosophical Problem
Zahavi, Dan, Husserl and Transcendental Intersubjectivity

Probing the Vicissitudes of the Cosmos: The Limits of Knowability in Literary and Scientific Worldviews

Joshua Wodak
Environmental Humanities, Western Sydney Uni-versity

Dr Joshua Wodak is a researcher, writer and artist whose work critically engages with cultural and ethical entanglements between environmental engineering and conservation biology as means to mitigate species extinction and biodiversity loss in the Anthropocene. He holds a BA (Honours) in Anthropology (Sydney University, 2002), a PhD in Interdisciplinary Cross-Cultural Research (Australian National University, 2011) and has exhibited his media art, sculpture and interactive installations in art galleries, museums and festivals across Australia and internationally. He is currently a Senior Research Fellow at the Institute for Culture and Society, Western Sydney University, and a Chief Investigator at the Australian Research Council Centre for Excellence in Synthetic Biology.

The concept of the World Turtle, when applied to metaphysics and epistemology, expresses how only fragments of details may ever be accessed from an infinite regression, whether probing ultimate origins, say of the universe, or ultimate ends, say of the earth. Given how the latter is ever-more self-evidently unfurling before us, it may seem untimely to further probe the vicissitudes of the cosmos. After all, it was our insatiable drive to interrogate how things work, from atom to atmosphere, and how seemingly disparate phenomena influence one another, from atom to atmosphere, that progressively revealed just how biophysical life as always already at the behest of radical asymmetry and radical contingency. And, to close the conundrum in a circle that can never be fully enclosed: the insatiable drive also revealed the limits of knowability in both literary and scientific probings of the World Turtle, and the myriad worldviews that arise from so doing.

In this presentation, I probe literary and scientific worldviews of the rupture of life on earth that is self-evidently unfurling before us. These worldviews offer, hover untimely, compelling insights into what this rupture means for re-worlding worldviews; not only in terms of being alive during such an upheaval, but actually being alive to upheaval itself. To illustrate this re-worlding, I draw on Joseph Meeker's landmark The Comedy of Survival: Studies in Literary Ecology, in the context of Cormac McCarthy's novels The Road and Sunset Limited, Lars Von Trier's film Melancholia, and the writing of George Bataille. The presentation explores these timely questions in affects and emotions (selfhood, solastalgia, sensation and wonder) and science (evolutionary biology, synthetic biology, climatology and Earth System Science), to consider how can we gain new knowledge through the epistemic use of imagination in literature, the arts and science. That is: how can we relate affects, emotions, and experientiality to these epistemic practices of making worlds? Ultimately, by reframing the current human-induced ecological crisis in the context of just how volatile life on this planet actually is, the presentation aims to articulate a new worldview for a new world coming, premised on fidelity to the vicissitudes of the cosmos.

Intertwined Vision

Since the Renaissance, the idea of art adheres to reality. Art seeks an invented reality, loses metaphor and attempts copying. The language of art goes down a road that has no outlet. Reality and language are distant, and then perspective is born. And next to perspective: order, balance, weight, gravity. The unfulfilled artist abandoned this road and deformed the bodies with the weight of feeling; Michelangelo and then Pontormo.

An absence was in the eyes of the painted Renaissance figures. And the question is about beauty. What mirror of Alice did the Renaissance artists pass through? A distant beauty disfigured reality.

The price was paid and reality folded into a grid based on perspective and hierarchies.

Yet the question remains until our time. When a new imaginary radically transforms our understanding of the problem.

Judith Butler reveals how the imaginary guides us into reality. Thus, two become many. Reality opens the eyes. The grid breaks down. The imaginary lives alongside reality, within the intra-action (Barad, 2017). The trouble (Butler, 2017) is the condition.

Saidiya Hartman redefines the idea of blackness. In her books, she has dismantled and redefined the imaginary of the black past. With Judith Butler, she seems to ask: What have you seen so far?

Gender and Black thought show a different way of looking, a new way of conceiving the real. They show the imaginary, the knowing, the real, and time interlocked and intertwined (Butler, 2022).

Art must be within this change. When the idea of full and empty, harmony, gravity, balance, perspective no longer describe our time. It may happen that science asks for words from art.

I submit an art video: a creative work.

Piera Benetti

Verona, Italy

Artist, her research focuses on the new imaginaries grounded by queer and black feminist thought. A new concept of depiction becomes an artistic language. She presented at CAIS 2021; NeMLA 2022, Baltimora; CCRS 2022, Chapell Hill; Queer(ing) Contemporary Italian Cultures, Toronto 2022; Gendercom 2022, Viterbo. She exhibited at CAMC, Coventry; San Servolo, Warwick in Venice, Cà Foscari CFZ and BAS in Venice; Spazio Oberdan in Milan; Gallerie dell'Accademia delle Arti del Disegno in Florence. She takes up her research in the upcoming exhibitions –Venice ArtNight 2023, Marignana Arte Project Room; Dissident Feminism: Inaugural Bell Hooks Symposium 2023, Berea KY.

Barad, K. (2017), Performatività della natura. Quanto e queer. Edizioni ETS

Butler, J. (2014), Fare e disfare il genere. Mimesis

Butler, J. (2017), Questioni di genere. Il femminismo e la sovversione dell'identità. Editori Laterza

Butler, J. (2022), What world is this? A Pandemic Phenomenology. Columbia University Press

Hartman, S. (2019). Wayward lives, beautiful experiments. WW Norton &Co

Hartman, S. (2021). Perdi la madre Tamu Edizioni

Latour, B. (2018). Non siamo mai stati moderni. Eleuthera

Morrison, T. (1998). Paradise. Frassinelli

Stengher, I. (2005). Cosmopolitiche. Luca Sossella Editore

Vivieros de Castro, E. (2017). Metafisiche cannibali. Elementi di antropologia post-strutturale. Ombre Corte

Using Models in Narrative Practice: From Characters to Social Impact

The talk explores the practical side of using models in the context of storytelling, starting from the question where models occur in narrative practice, what functions they fulfil and how they relate to each other. I will provide a tentative answer to this question and a first overview as a basis for discussion, arguing that the production, dissemination and reception of media narratives is shaped by various kinds of models that have a significant influence on the forms, uses, and effects of narrative in our society.

Jens Eder

Narrative and Aesthetics of Audiovisual Media at Film University Babelsberg, Potsdam

Jens Eder is Professor of Narrative and Aesthetics of Audiovisual Media at Film University Babelsberg KONRAD WOLF in Potsdam, Germany's largest film school and only university specialising in film. Eder's research focuses on intersections between narration, aesthetics, affect, societal contexts, and current developments of audiovisual media. Together with Britta Hartmann and Chris Tedjasukmana, he is PI of the research project Attention Strategies of Videoactivism on Social Media, funded by the Volkswagen Foundation. His recent work deals with the social impact of films; cinematic aesthetics, empathy, and perspective; and the analysis of characters and their forms and functions. Some of his publications are available in English, such as Characters in Fictional Worlds: Understanding Imaginary Beings in Literature, Film, and Other Media (co-edited with Fotis Jannidis and Ralf Schneider, de Gruyter 2010); Image Operations. Visual Media and Political Conflict (co-edited with Charlotte Klonk, Manchester University Press 2017) and the issue #Emotions of NECSUS (co-edited with Julian Hanich and Jane Stadler, 2019). Two books are in preparation: Characters in Film and Other Media. Theory, Analysis, Interpretation (Open Book Publishers 2023) and Video-Activism on Social Media (with Britta Hartmann and Chris Tedjasukmana, Intellect 2024).

Animal models of consciousness

Tudor Baetu

Département de philosophie et des arts, Université du Québec à Trois-Rivières

I am working on conceptual issues in the Philosophy of Biology, Medicine and Psychology, and their rami-fications in Philosophy of Mind, Metaphysics, Epistemology, Cog-nitive Science and Health Care Policy. These include the nature of pain experience, the epis-temology of multidisciplinary research and biopsychosocial approaches in science and medicine, the epistemology and metaphysics of causal- mechanistic explanations, the explanatory role of mathematical models and computer simulations, patterns of reasoning in experimental science, extrapolation and generalization in the life sciences, concepts of the gene, and species concepts.

The most direct and conclusive method of consciousness assessment relies on an active paradigm which requires subjects to understand language-based instructions, execute the mental operations indicated in the instructions, such as introspecting or imagining, and produce language-based responses, preferably verbal reports of consciousness contents. Since animals cannot be effectively trained to communicate using language, researchers are deprived of the very ability to directly replicate measurements of consciousness in non-human animals.

It has been proposed that the language obstacle can be circumvented once a theory of human consciousness gains sufficient empirical support; if such a theory specifies physical prerequisites of consciousness, then it also predicts that non-human animals and systems that satisfy these prerequisites are likely to be conscious. In response, I argue that the question of animal consciousness is an extrapolation problem like myriad others in the life sciences and, as such, is best tackled by deploying currently accepted methodology for validating experimental models of a phenomenon of interest. This methodology relies on an assessment of similarities and dissimilarities between experimental models, the partial replication of findings across complementary models, and evidence from the successes and failures of explanations, technologies and medical applications developed under the assumption of extrapolability.

Moreover, theoretical development and empirical research are inextricably entangled. Theories rely on prior extrapolations and theory testing generates evidence demanding the revaluation of extrapolative validity. To acquire a critical mass of findings that may act as constraints on an explanatory theory, researchers must first aggregate, and therefore extrapolate, findings generated across a variety of distinct experimental paradigms, each best suited for generating a particular kind of evidence. For instance, ethical and experimental desiderata dictate that a theory of consciousness will ultimately need to draw on data from both human and animal models, the latter being required to evaluate the potential explanatory relevance of fine-grained neural circuitry and molecular details. Conversely, once explanatory theories are developed, their eventual successes and failures inevitably prompt a reassessment of the validity of the initial extrapolations that guided the construction of theories.

Where Reason Fails: Literary Epistemologies of Death in the 21st Century

The sociologists Deborah Carr and Elizabeth Luth (2019) have recently described the end of life as a time span in its own right. Thanks to biotechnological development, the end of life is frequently quite long, even if accompanied by chronic diseases. Living in the face of death, however, remains a distinctly underexplored stretch of life. Cultural productions since the AIDS crisis and the onset of social negotiations of the concept of brain death have begun to fill the void left by the repression of death (Ariès 1973) in an increasingly secular Western world with a "new cultural visibility of death" (Macho & Marek 2007). In this context, Kley positions autobiographical and more explicitly fictional writing concerned with life in the face of death as much-needed forms of alternative knowledge production to medical, nursing, insurance and legal discourses. In late capitalist societies, these latter discourses have been the dominant modes of addressing the end of life. Specifically literary forms of knowledge production draw on, question, connect and undermine or strengthen disciplinary and systemically specific bodies of knowledge – and Kley argues they address concerns which, in the present context, occur within medical institutions and the health care system, but cannot be fully addressed there. Her talk seeks to demonstrate how literary writing serves to imagine life in the face of death and to develop literary epistemologies of death where rational knowledge seems to fall away.

Antje Kley
American Studies, University Erlangen-Nürnberg

I am working on conceptual issues in the Philosophy of Biology, Medicine and Psychology, and their ramifications in Philosophy of Mind, Metaphysics, Epistemology, Cognitive Science and Health Care Policy. These include the nature of pain experience, the epistemology of multidisciplinary research and biopsychosocial approaches in science and medicine, the epistemology and metaphysics of causal- mechanistic explanations, the explanatory role of mathematical models and computer simulations, patterns of reasoning in experimental science, extrapolation and generalization in the life sciences, concepts of the gene, and species concepts.

Future Responsibilities and Affordances: Class, Catastrophe, and Ownership in Science Fiction

When William Gibson described our experience in the 21st century as, at times, feeling slammed against the windshield of the present, he implicitly referred to what Fredric Jameson had defined as maybe one of the most important functions of cultural production in late capitalism: the project of offering "cognitive mapping" when public discourse and individual agency are fundamentally hampered by a temporal and spatial disorientation.

Science Fiction has historically defined itself as concerned with temporality and the imagination of future scientific and technological developments and, as Hoepker's talk argues, recent publications have seen an increased urgency for spatio-temporal constructions which renegotiate the relevance of a tangible future. As Kim Stanley Robinson's novel Ministry for the Future (2020) illustrates, future must be actively considered a present stakeholder in social processes of decision-making that negotiate acceptable risks and legitimate use of resources. The TV-series The Peripheral (Amazon, 2022–; based on the 2014 novel by Gibson) on the other hand stages the conflict as a class conflict via a fictional universe of temporal plasticity and parallel timelines, in which a post-apocalyptic future of privileged survivors interferes with a precatastrophic present. Hoepker's analysis focuses on the way in which texts perform interventions into public debate as actors in complex social processes; they contribute to a cognitive mapping through alternative forms of knowledge productions that, rather than providing answers to open questions as social and natural sciences might, offer means of reflection and orientation through their aesthetic strategies and narrative techniques. While class conflicts over ecological resources, economic interests, and physical and intellectual property rights present a rich thematic field of discussion, Hoepker foregrounds fictional world making's implicit knowledge production through an exploration of affordances of form which renders visible cultural techniques of imagining the elusive and practice ethical reflection tied to accessibility.

Karin Hoepker

American Studies, University Erlangen-Nürnberg

Karin Hoepker is guest professor of North American Literature at the John-F.-Kennedy-Institute at Freie Universität Berlin, and a PI of the Research Training Group "Literature and the Public Sphere in Differentiated Contemporary Cultures at Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany. Her research focuses on history of knowledge and the novel, science and fiction, urban studies, and, lately, on self-optimization and the semantics of love.

She has studied, worked and researched at Bowdoin College, Stanford, Princeton, and Indiana University, Bloomington and was a guest professor at Vienna and Bonn University. Her first book No Maps for these Territories (Rodopi 2011) combines contemporary architectural theory and urban studies with literary studies and discusses historic imaginations of the city of the future in William Gibson. Her second book project The Edge of Reason: Fiction, Risk, and Probability in American Antebellum Narrative investigates the emergence of risk and the function of fiction in US antebellum literature and has won the Habilitationspreis 2018 of the FAU.

Mediating Blackness. The Afrofuturist Planetary Posthuman in Black Panther

Working with the theoretical model of the planetary posthuman, Kundu explores how science fiction, especially afrofuturist science fiction film and graphic novels, contributes to public discourse and cultural formation in the US and North America, where epistemic transformation in the ideas of race, otherness, and blackness are critical in its political and cultural landscape and where institutionalized racism is an everyday reality. In her presentation, she analyses specifically the film Black Panther (2019), directed by Ryan Coogler – a commercially successful and ground-breaking work of afrofuturist science fiction, as an aesthetic experiment in fictional world-making modelled around an alternative energy source (Vibranium) and post-colonial considerations of extractivism. She investigates how a Hollywood science fiction film functions as an intervention into contemporary cultural discourses on race and otherness, and how it may be read as contributing to an epistemic transformation regarding an understanding of Blackness through an imagination of afrofuturist planetary posthuman subject(s).

Arunima Kundu

American Studies, University Erlangen-Nürnberg

Arunima Kundu holds a master's degree in Global History from the Free University and the Humboldt University in Berlin, Germany and a second master's degree in Intercultural Anglophone Studies from the University of Bayreuth, Germany. She holds a bachelor's degree with honours in History from Jadavpur University, Kolkata, India. In 2022, she joined the Research Training Group "Literature and the Public Sphere in Differentiated Contemporary Cultures" at the Friedrich Alexander University Erlangen-Nuremberg (FAU) in Bavaria, Germany as a PhD candidate. Her research interests include American literary and cultural studies, critical posthumanist theory, postcolonial studies and intellectual history.

Simulationalist versus Embodied Approaches in Aesthetics

Onerva Kiianlinna
Aesthetics, University of Helsinki

Onerva Kiianlinna is a doctoral researcher in Aesthetics at the University of Helsinki. She is working on her doctoral thesis on aesthetic judgment in contemporary Evolutionary Aesthetics. Onerva is vice-President of the Finnish Society for Aesthetics and Secretary of the Nordic Society for Aesthetics.

The recent rise of 4E cognition has formed an influential opposition to the mechanistic or computational outlook on cognition. In the meanwhile, the helpfulness of the dichotomy of these two approaches in looking at cognition has been questioned. I suggest that contemporary Aesthetics should better acknowledge this criticism rather than stay within the seeming – and rather misleading – dichotomy. The ultimate benefit of this would be furthering epistemic synergies by seeing that if we take a closer look at what they explain, the approaches may not be seen as rivals but mutually beneficial contributors to systems thinking in Aesthetics.

My paper explores the relationship between the mechanistic (also here: simulational, or representational, or computational) and the 4E (embodied, enactive, extended, and embedded) explanation of aesthetic judgment. I hold that the philosophical understanding of this relationship is not clear in Aesthetics based on arguments putting mechanistic and embodied models – or "modularity" and "global dynamics and interactions" – opposed to each other. I argue that simulationalism is, in fact, in alignment with the principles of 4E cognition.

Here, I use "4E" as an umbrella term for research using either all four Es, one of them, or any of their combinations. First, I argue that the representational framework emphasizing computationality, and 4E cognition emphasizing holistic interaction of a bodily organism with its environment are not truly alternative, because they do not explain the same things. Then, I explore how these two different levels of abstraction could come together in the case of looking at making aesthetic judgments as a cognitive process. Together, this forms a clarification of how to understand the relation of mechanistic and 4E explanations in Aesthetics. To restrict the scope of this paper, the focus is in defending mechanistic outlook from the critique of 4E, as proponents of the latter often start with differentiating themselves from the first.

My aim is to illuminate how 4E cognition and computationality or representationality could be understood in Aesthetics, and even more specifically, when talking about aesthetic judgment. Rather than aiming at a comprehensive theory, this paper should be seen as a preliminary experiment with the aim of building new common ground by charitably cherry-picking specific ways of understanding the key concepts "representation", "aesthetic judgment", "mechanism", and each of the four Es.

Schelling on Simulation and the Construction of Reality

Gabrielle Reid

German Literature, Yale University

Gabrielle Reid is a PhD candidate in the German department at Yale University. Her dissertation, Magnetism between Physics and Poetry: Goethe, Schelling, Schlegel, and Ritter on the New Mythology, expands on the significance of magnetism across literary, philosophical, and scientific texts circa 1800 to challenge the centrality of polarity as a guiding motif of German Idealism and Romanticism. She argues that these authors turn to the magnet to help them move beyond, rather than embrace, a dualistic and polar understanding of the world. Her article on this topic titled “Friedrich Schlegel’s Philosophy of the Middle, or Physics and the Transition Between Forms” is published in Symphilosophie, volume 3. She also participated in the seminar “Model Realities: On Simulationstechniken” at the German Studies Association conference this past year. Before graduate school, she studied comparative literature and mathematics at NYU, where she wrote a thesis on the semiotics of the triangle in works by Kant, Maimon, and Novalis. She is also interested in the role of idealization in math and science and how it relates to theories of the novel in the early 20th century.

This paper uses Schelling’s philosophy of nature, particularly his physics of magnetism, to imagine alternate possibilities for the discourse on metaphors, models, and simulations as epistemic tools. As we are today, Schelling was interested in how knowledge and the objects of our knowledge are produced, both in everyday experience and across academic disciplines. Critical of Newtonian experimental science, Schelling insists that to know nature we must be able to construct it. His philosophy can be viewed as an experiment in simulation, aimed at producing reality and intervening in nature instead of carrying out empirical studies that merely reflect a reality from which experiments are separated. Schelling thereby challenges the idea that simulation replaces the reality it represents (Kittler). Instead, simulation becomes a tool for generating reality.

Situating Schelling in the genealogy of simulation reveals a version of simulation that challenges the distinction between natural and manufactured reality. This common distinction has led scholars to question the adequacy of our discourse on simulation, which, since it uses natural language, is said to only ever approximate the invisible language (e.g., computer code) of the virtual world (Kittler, Pias). If science no longer represents, but rather constructs nature, are we still left with this gap between simulation and its theory? Just as authors have turned to other genres such as fiction to explore the topic of simulation, Schelling originally turned to art and poetry to complete Naturphilosophie’s project. Art, Schelling argues, can immediately display what for science would be an infinite task. Despite these apparent limits of science, Schelling also claims in the same text that each magnet does function as a symbol of nature as a whole. This gives to the subject matter of natural science the role supposedly reserved for art. Two years later, Schelling seems to change his mind about the priority of art and poetry entirely, now favoring science. The magnet is at the heart of this new system as well.

I explore these themes in Schelling by examining how he gradually introduced a more concrete use of the magnetic line, from describing it abstractly in his First Outline (1799) to providing diagrams in his Presentation of My System (1801). I conclude that the magnet functions as the poetic element in Schelling’s philosophy of nature, by which he embeds poetry in science. Ultimately, Schelling’s magnet both enables simulation and functions as a model of how simulation operates.

Artificial Models of Involuntariness: Max Bense's Cybernetic Poetry as Epistemic Creation of Futures

In the historical relationship between the natural sciences and the humanities, technological progress has played a crucial role in researching and applying epistemic models in the aesthetical field. The rise of cybernetics stands out in this relationship thanks to its programmatic interdisciplinarity: it seeks to rethink epistemological, artistic, and ontological categories, while simultaneously translating its findings into technical or heuristic models. Among the experiments in cybernetics, the work of Max Bense (1910–1990) is indeed a remarkable case: as a theorist and artist of the digital turn, he shaped the philosophical and the poetological discourse of postwar modernism by integrating the act of programming into cognitive and design processes.

Together with the members of the Stuttgart Group and researchers at the Technical University in Ulm (including Theo Lutz and Abraham Moles), Max Bense developed a model of creation and reception of artifacts based on the word rather than the sentence. The word is then conceived as a point in a topological space and used statistically in its materiality for the programming and production of linguistic beauty. In this way, Bense provided the first examples of computer-generated poetry, i.e. of the so-called "poetry". By this, he meant the product of a new, hybrid subjectivity characterized by procedural involuntariness. As an expression of being (Sein) in the technical world, this kind of poetry aims at generating relations of indeterminacy that "anticipate in an incompletely fixable linguistic world [...] a possible non-linguistic external world" (Bense 1961, o. p.).

Moreover, the application of mathematical structures to lyrical processes separates the rhythm of a poem from its meaning. This effect – it is argued – represents an important transformation for poetry as a genre. Given such a fundamental separation, how should we read computer-based poetry? From the philological perspective, these changes within the genre also require new epistemological methods of analysis that reflect the hybrid nature of this new kind of authorship, which is formed by a conscious, programming, an 'analog' part (the human) and a contingent, random-thinking and 'digital' one (the computer).

Accordingly, Max Bense's stochastic poetry is being discussed here from a double perspective: on the one hand, a reconstruction of the stochastic creation process will show how the word-based model was statistically transferred into the field of poetry, as an aesthetic practice for the indeterminate production of futures. Secondly, the paper will propose a model of analysis for these poems that aims to combine the information-aesthetic approach with the most recent theory of poetry.

Rosa Coppola

German Literature, Alexander von Humboldt-Stiftung, LMU Munich

Rosa Coppola: studied German and Slavic studies in Naples, Hamburg, Berlin and Tomsk; In 2019 she held a DAAD-scholarship at the Institute for Theater Studies at the FU Berlin; In 2020 she obtained her PhD at the University of Naples with the dissertation Der Elefant im Raum. Kathrin Rögglas Prosawerk im Spannungsfeld zwischen Engagement und Performanz; currently she is post-doctoral fellow of the Alexander- von-Humboldt-Foundation at the LMU (Munich) with the project Hybride Verfasser des künstlichen Dichtens: Eine Studie zur Stochastischen Lyrik von Max Bense. Her research interests include: Forms of linguistic Sprachskepsis und Sprachkritik, representation and conceptualization of artificiality, and configurations of the lyric addressee in the context of late modern and contemporary German-language literature.

New Phenomenologies of Pain and Disease through Experimentations with Digital Technologies in the Arts

Among the current global challenges, health is one of the most pressing and complex ones. That is, in part, because it encompasses and is linked with other global problems such as ecological crises, economic disparities, and unequal treatment for certain groups of people. This presentation is intended as a contribution to the differentiation of the topic through an exploration of aesthetic conceptions of disease and the resulting consequences for our conceptions of health and subjectivity. I will explore art works that use immersive technologies like Virtual Reality and haptic media to make available new phenomenologies of pain and disease. I argue that novel aestheticizations of pain and disease enable alternatives for our conceptions of health and wellbeing, which commonly focus on the numbing or controlling of unwanted and painful sensations. One of the artworks I will be discussing uses haptic media and VR to enable the experience of chronic pain: the installation/performance piece “Seeing is believing” by Eugenie Lee. The Australian artist created a multisensorial experience that involves stages of cognitive manipulation, immersive experience and elucidation. In my analysis I will demonstrate how the aesthetics of the piece sheds new light on conceptions of health and wellbeing in post-enlightened societies. In focusing on the ways the bodily sensorium and the affective dimension of experience are intensified and made explicit part of the aesthetic experience through haptic technologies as well as “perceptual trickery” and suggestive language, I will argue that the piece challenges the meaning of having and being a body, and ultimately the capitalist commodification of bodies.

Desiree Foerster

Media and Culture Studies, Utrecht University

Dr. Desiree Foerster is an assistant professor for Media and Culture Studies, with an interest in media aesthetics, affect, and experimental practices. She graduated from the Institute for Arts and Media, the University of Potsdam with her thesis “Aesthetic Experience of Metabolic Processes”. Taking on the perspective of process philosophy and media aesthetics, she investigates here the impacts of liminal experiences on human subjectivity. During her Ph.D. and her post-doctoral position at the University of Chicago, she conducted several research-creation projects together with artists, designers, and academics from Concordia University (CA), Arizona State University (US), and IXDM, Basel (CH). She studies Aesthetics, Media Ecologies, Affect, Haptic Media, Phenomenology, Process Philosophy, and Immersive Environments.

The Logic of Prevention: Anticipatory Narratives, Concepts, Models and Metaphors in Covid-19 Biomedical Imaginaries

My paper examines how Covid-19 narratives and practices have mobilized a vast biomedical archive of concepts, metaphors, models and techniques centered on the anticipatory logic of prevention. Indeed, the logics of prevention and anticipation have historically featured prominently in western technocultural imaginaries, from inoculation and nutrition to surveillance and securitization regimes. During the Covid-19 global pandemic, masks, vaccines, social distance, and (self)isolation became key biomedical object-practices (re)enacted to manage the public health crisis. Predicated on a foundational separation between inside and outside, or between the internalized, vulnerable, visceral space of the individual(ized) human body and an externalized, hazardous, contaminated shared environment, strategies for avoiding exposure became paramount, reciting a long genealogy of preventative measures that encompass protection, containment, prediction, and risk assessment. Mobilizing the transdisciplinary methodologies of feminist technoscience studies, in particular authors like Evelyn Fox Keller (2000, 2002), Susan Squier (2003), Emily Martin (1994), Margrit Shildrick (1997, 2002), Karen Barad (2007), Michelle Murphy (2006) and Mel Chen (2012, 2020), my paper examines scientific articles about Covid-19 ranging from the fields of epidemiology, virology, immunology, biochemistry and genetics, alongside scientifically based governmental and media reports. Throughout, I seek to show how older, influential or obsolete, biomedical imaginaries haunt cutting-edge research about the Covid- 19 pandemic and the vast range of anticipatory and preventive practices they elicit.

Sofia Varino

Cultural Studies, University of Potsdam

Sofia Varino is a cultural historian, writer, and activist living in Berlin. Varino holds a PhD in Cultural Studies with a Certificate in Art & Philosophy from Stony Brook State University of New York (SUNY) and is a postdoctoral researcher affiliated with the minor cosmopolitanisms graduate program at the University of Potsdam in Germany. Cutting across feminist political ecology, feminist science studies, and intersectional gender studies, Varino's research focuses on the genealogical entanglements of social and biological phenomena. Their new book Aquatopia: Climate Interventions (Routledge, 2023), co-authored with May Joseph, is a site-specific study of queer decolonial ecologies. Varino has co- edited a special issue of Somatechnics on Data Matters: (Un)Doing Data and Gender in the Life Sciences (Edinburgh University Press, 2019), and published in peer-reviewed journals like Shima, Whatever, Somatechnics, European Journal of Women's Studies, and Women's Studies Quarterly, as well as in the edited collection The Bloomsbury Handbook to the Medical Environmental Humanities. Varino lectures regularly at the Center for Transdisciplinary Gender Studies at Humboldt University of Berlin, where they have taught graduate seminars on topics ranging from science and technology studies and queer ecologies to body studies and intersectional queer and feminist methodologies. Alongside their academic writing and teaching, Varino works with poetry, performance, digital media, and public art. Varino is currently writing a book about social and cultural histories of the Covid-19 pandemic encompassing racial, disability, and climate justice.

Force-Dynamic Structure: Cases of Theories of Humor and Hysteria

Mohsen Forghani
Philosophy, University of Warsaw

He is a PhD candidate in Philosophy at the University of Warsaw, whose research interests include philosophy of language, cognitive science, and pragmatics. He has a deep passion for exploring the complex workings of the human mind. His current work explores the theories of Humors in ancient medicine and Hysteria in psychodynamics, using Force-dynamic schema from cognitive linguistics to provide a fresh perspective.

As suggested by cognitive linguists, image schemas reflect structures of our bodily interaction with our environment which enables us to acquire abstract concepts. These schemas were introduced to explain the possibility of abstract reasoning and conceptualization (Johnson, 2005). Moreover, they may serve another role: they are parallel notional systems across different epistemic domains, e.g., naïve physics and folk psychology (Talmy, 2000, P430).

This article is devoted to the force-dynamic structure which was mainly developed by Talmy (1988; 2000) appealing to two explanatory seminal theories in the history of science in the study of the human body and psyche: A) The Theory of Humors suggested by Hippocrates in the 4th Century BC, which considers the body consisting of four humors (blood, phlegm, yellow bile, black bile) in balance to make one person healthy B) Freud's theory of Hysteria which is based on his concepts of unconscious- conscious, repression, trauma. Accordingly, in order to treat hysteria, suppressed memories of the patient should be unveiled to a conscious level (Talmy1988).

This essay analyses these theories with reference to force-dynamic structure conceptualization. Force- dynamic schema is patterns for the interaction of different entities in terms of force and resistance. Possible results for the contrast between opposite forces are dependent on strength of opposing forces. In given cases, the states of blockage and removal of that blockage are significant. Whether these theories are scientifically reliable or not, this schema has been acceptable from both ordinary and expert perspectives for a long period of time. Considering this fact, I will question the role of force-dynamic schema in interdisciplinary communication and expert-to-public communication. Analyzing selected examples, I propose that force-dynamic schema is a powerful apparatus used for hypothesis generation and transferring knowledge across multiple disciplines in science. Toward the end, I will also evaluate to what extent these schemas were in line with contemporary theories. If not, I will discuss briefly if these schemas are to blame or led by some unfalsifiable assumption in these theories.

Bogousslavsky, J., & Dieguez, S. (2014). Sigmund Freud and hysteria: the etiology of psychoanalysis. In Hysteria: The Rise of an Enigma (Vol. 35, pp. 109–125). Karger Publishers.
Johnson, M. (2005). The philosophical significance of image schemas. From perception to meaning: Image schemas in cognitive linguistics, 15–33.
Jouanna, J. (2012). The legacy of the Hippocratic treatise the nature of man: the theory of the four humours. In Greek medicine from Hippocrates to Galen (pp. 335–359). Brill.
Talmy, L. (1988). Force dynamics in language and cognition. Cognitive science, 12(1), 49–100.
Talmy, L. (2000). Toward a cognitive semantics: Volume 1: Concept structuring systems.

Beyond Binary – AI, SF, and the Moral Imagination

Using Amy Kind's work on epistemic accessibility and Mark Johnson's Moral Imagination: Implications of Cognitive Science for Ethics (1993) as a framework, Teodorescu proposes a reading of C. Robert Cargill's 2021 novel Day Zero which illuminates the potential role of the literary in the field of contemporary debates over AI, robotics, and issues of artificial corporeality. Cargill's text – as one within a host of recent novels published beyond the field of genre SF which address posthumanity and our machine others, such as Ishiguro's Klara and the Sun (2021), Ian McEwan's Machines Like Me (2019), or Margaret Atwood's The Heart Goes Last (2015) –ventures into explorations of radical alterity. The novel opens up discussions of how, both as technology and as thought experiment, AI challenges ontological and ethical delimitations, and questions the ontological foundations of an ethics of recognition. Where, in the face of otherness, we may struggle with disorientation and experiences of inaccessibility, an important function of fiction may lie in its ability to prime an epistemic use of imagination and allow for new inroads of re-modeling and re-adapting epistemological frameworks.

Ruxandra Teodorescu

American Studies, University Erlangen-Nürnberg

Ruxandra Teodorescu (she/her) is currently working as a doctoral candidate in the DFG-funded research training group "Literature and the Public Sphere in Differentiated Contemporary Cultures" and the Friedrich-Alexander-University Erlangen-Nürnberg. Her research interests are in the areas of critical posthumanism, philosophy of mind, and morality and ethics in relation to English-language literature In her dissertation project, she investigates how human and artificial co-existence is depicted in literature and film and how these depictions challenge moral standards, thus pursuing a more posthumanist approach to morality. She studied Literature, Media and Culture in the Modern Era, M.A at the University of Mannheim, King's College London and the University of Exeter.

Post-Petro Imaginary and Utopian Social Enclave in Theresia Enzenberger's "Auf See" (2022)

In her novel Auf See Theresia Enzensberger develops a utopian life world, the so called "Seestadt" – a floating city in the Baltic Sea. The story is told by the 17-year-old Yada who grew up in this new community. A community which has been founded and designed by her father as an escape from the dangers of a late capitalist and neoliberal life on the mainland. Villinger explores the novel's engagement with an alternative social enclave and its critical reflection on what Bloch called the "utopian impulse." Her analysis shows how literary aesthetics visualizes and renders imaginable processes that remain otherwise invisible due to their scale, complexity, and slow incremental change. By focusing on the dichotomy of island and mainland, Villinger reads Enzensberger's novel as a counterpoint to patriarchal and capitalist social structures, which deconstructs heteronormative gender relations and power hierarchies. As the novel critically engages with aspects such as death, environmental disaster, and global warming, it grapples with the central question of our capability to imagine an alternative to the present: What happens, when our ability to imagine the future fails us?

Antonia Villinger

German Literature, University Erlangen-Nürnberg

Dr. Antonia Villinger, since 10/2022 Post-Doc in the DFG-Research Training Group "Literature and the Public Sphere in Different Contemporary Cultures" at FAU Erlangen-Nürnberg; previously research associate at Otto-Friedrich-University Bamberg (2020-2022) and research assistant at "Morphomata. Center for Advanced Studies in the Humanities" at the University of Cologne (2017-2020); 04/2021 PhD at the University of Mannheim with the study "Dramen der Schwangerschaft. Friedrich Hebbel's 'Judith', 'Maria Magdalena' und 'Genoveva'" (Ergon-Verlag 2021), awarded the International Wendelin Schmidt-Dengler Prize of the Austrian Society for German Studies and the Young Talent Award of the Hebbel Society and the Hebbel City of Wesselburen. In her current research project "Kohletexte. Kohle als Energiequelle in der deutschsprachigen Literatur nach 1945" (second book) she analyzes the representation of coal and energy in literature. Her research interests are Energy and Environmental Humanities, Gender Studies, Romanticism. She is co-founder of the junior research network "Energy and Literature".

Modeling Libertarian Collectives

Elisabeth Reichel

American Studies, University Erlangen-Nürnberg

A. Elisabeth Reichel is Assistant Professor (Akademische Rätin) of American Studies at Osnabrück University. She is the author of Writing Anthropologists, Sounding Primitives: The Poetry and Scholarship of Edward Sapir, Margaret Mead, and Ruth Benedict (Univ. of Nebraska Press, 2021) and co-editor of Boasian Aesthetics: American Poetry, Visual Culture, and Cultural Anthropology (spec. issue of Amerikastudien/American Studies, 2018). She is currently editing a special issue on Posthuman Economies (Interconnections 2.1, forthcoming March 2023). Her main research interests lie in North American literature and culture, the history of anthropology, economic criticism and the economic humanities, sound studies, (inter)mediality, and book studies.

In an effort to move forward from dominant methodologies in the humanities that tend to vest attention to the singular and the particular with progressive political force, Caroline Levine and Anna Kornbluh have proposed new generalizing reading practices that engage readers in the design of political models for collective well-being. Levine, for one, suspects individual freedom and aesthetic anti-instrumentality to be the values that undergird current singularizing work in the humanities and conceives of "model thinking" as a reading practice that helps humanities scholars to embrace more collective values, including equality and mutual care, and to consequently contribute to large-scale transformation toward forms of social organization that reflect these values.

This paper seeks to further think through the peculiar ways in which literature affords the design of generalizable political models, by turning its focus to literary models of collective living that, paradoxically, highly value individual freedom. Science fiction's infamous libertarian strand has persistently been used for activism in opposite political directions from those espoused by Levine and Kornbluh. Novels by Robert Heinlein present models for collective living that take individual freedom to be the preeminent political value, as they sustain continuous tensions between an ideal of disruptive singularity – often driving the plot – and the collective values necessary for building larger social structures. While models in the social and natural sciences promise scalability and transferability of knowledge, Heinlein's literary models, in their "nonscalable" design (Anna Tsing), are unable to deliver on these promises. The collectives to which they give rise thrive but in the literary imagination.

Industrial Metaphor Transformed in Charles Dickens's Dombey and Son (1848) and 'The Signal-Man' (1866)

Neil Addison

British Literature, Japan Women's University, Tokyo

Neil Addison (PhD, University of Birmingham), is Professor of British Literature in the Department of Humanities and Culture at Japan Women's University. Having grown up in the U.K. in Thomas Hardy's Dorset he is now vocationally based in Tokyo, where his research focuses on nineteenth- and early twentieth-century British literature. He is currently working on a monograph on Hardy's poetry and is the Commission on Science and Literature (CoSciLit) Regional Representative for Asia.

Charles Dickens's novels depict nineteenth-century men of science as figures of societal progress. The ironmaster Rouncewell in Bleak House (1853) and the inventor Daniel Doyce in Little Dorritt (1857) both challenge antiquated and dysfunctional institutions. This reflects the fact that Dickens's personal library held a wide range of scientific titles, demonstrating his broad interest in the subject (Nixon 271). He also gave several public speeches praising the industrial city of Birmingham, lauding 'its inventions which are constantly in progress' (Collins 653). Yet Dickens represents scientific inventions such as locomotives as an industrial metaphor of personified menace which threatens both the individual and society. Dickens was only 18 when the 'Rocket' locomotive made its first commercial journey in 1830, but by 1846 the steam train had appeared in the early numbers of Dombey and Son (1848). Here, the new railway stations were shown transforming their environs, urban upheaval acting 'like the giant in his travelling boots' (500). By 1851 Dickens's periodical Household Words (1850-59) was also drawing direct attention to railway safety due to the increasing number of accidents (Nixon 309) and in Dombey and Son Mr. Carker is killed under a train. While Dickens describes the locomotive in demonic terms, in his short story 'The Signal-Man' from Mugby Junction (1866) his title character is mown down by a train after being haunted by a ghostly presence. These writings partly reflect the way Dickens was greatly influenced by pantomime, which broadly underpinned his aesthetics (Eigner 8). But his ominous descriptions of trains in Dombey and Son and 'The Signal-Man' also seem to draw from another source. Dickens was personally affected by his involvement in the 1865 Staplehurst railway accident, later describing how he clambered from the wreckage amongst the wounded and dying. But his macabre train passages can also be traced to the legacy of the sublime. Edmund Burke's 1757 definition included dread and terror, qualities which are evident in Dickens's treatment of storms and which reflect the sea paintings of J.M.W. Turner (Dennett 1994). Dickens's representations of trains can be further connected to Turner's industrial paintings, which reflect an 'industrial sublime' (Rodner 107). I will discuss how Dickens's personification of these industrial modes of transport was transformed by both science and aesthetics. Such locomotive passages in his works function as a metaphor of dread and horror, an 'industrial sublime' which warns his readers of the potential terrors of industrial transport.

The Political Calculator in Jules Verne's Lunar Stories

Su Min Kim

College of Liberal Studies, Seoul National University

Su Min Kim is a scholar of nineteenth-century British literature. Her research focuses on the intersections of literary and mathematical history in nineteenth-century Europe. She is currently an academic advisor and a coordinator of undergraduate programs at the College of Liberal Studies, Seoul National University.

Like so many fictional narratives about the Moon in the nineteenth century, Jules Verne's De la terre à la lune (From the Earth to the Moon) (1865) and Autour de la lune (Around the Moon) (1870) explore the European colonial drive. But unlike so many fictional narratives about the Moon in the nineteenth century, Verne interweaves his narrative with numeric, algebraic, and geometric calculations. While literary critics comment often on the themes of colonial exploration and expansion in Verne's works as well as his fictional representations of mathematics and science, they have yet to examine extensively how Verne combines his narrative with mathematical calculations to advance the political agenda of his novels. De la terre à la lune and Autour de la lune demonstrate that he understood how mathematics and fiction were both at once speculative and empirical. I argue that Verne engages with this shared feature between mathematics and fiction to chart a geopolitical route that challenges the colonial, military expansion of European empires—a route that serves ultimately as a model of an internationalist practice of science and geographical exploration.

Dust as Metaphor and Model in Philip Pullman's His Dark Materials

Katja Schmieder
American Studies, University of Leipzig

Katja Schmieder received her doctorate degree in American Studies from the University of Leipzig, where she does research and teaches in the field of Anglo-American Literature and Culture. Her interests include interdisciplinary approaches to (medical) crime fiction, representations of science in "science-in-fiction," and the manifold overlaps of literary and scientific discourses. She is currently working on a project on the (con-)textualization of Anglo-American childbirth and its historical relations to issues of power and control.

Located at the crossroads of Bildungsroman and Oxbridge mystery, Philip Pullman's fantasy trilogy His Dark Materials (1995–2000) has inspired a host of works – from academic articles to reader guides and discussion panels. Most of them focus on the manifold ways the story about the girl Lyra and her quest explores the themes of science and religion, and one of the central motifs – Dust – has been widely interpreted and analyzed, for example as a metaphor (e.g., by Bird) of the relationship between morality and knowledge. However, I will argue that it serves as a physical and a theoretical model (according to Toon) – and as a metaphorical model, creating a link between scientific and fictional strategies of world- making.

In the multiverse of His Dark Materials, the controversial Dust is a cloud of particles that surrounds only adult human beings and can only be visualized with certain state-of-the-art imaging techniques by certain people. Interestingly, it develops during puberty, and its density and size depend on the respective person's intellectual and emotional capacities. As such, the complex motif of Dust allows for a metaphorical reading in its association with the power of human imagination and knowledge but also for an understanding as a model, a physical substance that can be measured and studied. Additionally, popular transmedial adaptations of the novels – the US American movie The Golden Compass (2007) and the BBC/HBO series His Dark Materials (2019–2022) – illustrate and emphasize these multidimensional properties of Dust.

As I hope to show in my presentation, the fictional concept of Dust in His Dark Materials not only explores the relationship between spirituality and scientific knowledge but also its potential impact on the nature of scientific knowledge acquisition itself. Through transmedial adaptations and their make- believe strategies (Kroeber), the story also affords an interrogation of human consciousness and conscience, which I read as a critique of an immoral pursuit of power through knowledge – personified by the elitist, church-like Magisterium. The metaphorical and physical properties of Dust as narrated in His Dark Materials thus self-reflect on the world-making potential of literature and at the same time relate it to the discourses of science.

Abstractionism and Simulation in Software Development

Lucas Bang
Computer Science, Harvey Mudd College, California

Lucas Bang is a computer scientist and emerging digital artist with growing interests in socio-cultural aspects of computing. With a formal background in software verification and program analysis, his recent work focuses on tensions and absurdities that arise when making ethereal computational abstractions executable, tangible, tactile, and visible. His work draws upon media theory, cognitive science, and formal models of programming in order to provoke contemplation about computing, software, labor, craft, and embodiment.

I argue that abstractions, as conceived of in the recommended best practices of software authorship, should be explicitly recognized as standing reserves of simulation.

Abstraction is the fundamental tool of software engineering. Indeed, Abelson, Sussman, and Sussman's Structure and Interpretation of Computer Programs opens with a 1690 quote from John Locke arguing that "separating [ideas] from all other ideas that accompany them in their real existence [...] is called abstraction, and thus all its general ideas are made". In software development practice, the framing of abstractions as standing reserves of simulation typically goes unacknowledged. Further, the user experience of software is mediated through invoked simulations, that is, instantiated abstractions.

Additionally, abstractions, like other tools of extended agency and thought are far from neutral, enabling abdications of accountability when software inevitably violates expectations. Consequently, it is imperative to intervene and formulate software practices that explicitly recognize (and problematize) abstraction-driven mediations.

To support my position, I project Rotman's mathematized Person-Subject-Agent trichotomy of semiotic actors onto software development processes. In computing, the standing reserve of executable simulation within software's source-coded abstractions distances the Person (author), Subject (notional machine) and Agent (CPU or virtual machine) dramatically more so than in the fields of mathematics and logic from which software development culture's abstractionist practices are drawn. With a historical and post-phenomenological framing, I develop a critique of abstraction in software authoring by examining the computer scientist's cliche, "let the symbols do the work". This popular pithy programmer's slogan for offloading one's cognitive effort into symbols is not only more naive than Whitehead's claim that "civilization advances by extending the number of important operations which we can perform without thinking of them", but more pernicious than Liebniz's even pithier "Calculemus".

Computational abstraction is an unavoidable process in the practice of software authorship (and in science more broadly) due to its powerful ability to reduce cognitive effort. But, uncritical adherence to abstractionist thinking pushes developers to dangerous levels of hyperrealism. I highlight this tension through concrete examples including (1) the 2022 controversy around KFC's tweet to German followers "It's memorial day for Kristallnacht! Treat yourself with more tender cheese on your crispy chicken" caused by software automation and (2) type-driven functional software development growing in prominence particularly at powerful financial firms.

Recognition that software's abstraction are standing reserves of hyperrealistic simulation is crucial to building a future where humans can thrive in an increasingly computation-mediated world.

Representational Requirements on Explainable Machine Learning Models

Koray Karaca

Philosophy, University of Twente

Koray Karaca is an assistant professor in the Department of Philosophy at the University of Twente. He holds a Ph.D. in theoretical physics from the Middle East Technical University, Ankara, Turkey, and a Ph.D. in history and philosophy of science from Indiana University, Bloomington, USA. Before coming to the University of Twente in September 2015, he worked as a postdoctoral researcher between in the interdisciplinary research project The Epistemology of the Large Hadron Collider, funded by the German Science Foundation and based at the University of Wuppertal, Germany. Earlier, he taught in the Department of Philosophy at the University of South Florida. His current research interests include the epistemology of data selection and analysis, computer simulation, and machine learning.

The opacity of the internal working of deep machine learning (hereafter DML) models makes it impracticable for humans to understand how these models process big data sets and thereby produce predictions. In contexts where DML models are used to make high-stake decisions, such as medical diagnosis of chronic diseases, it is therefore of utmost importance not only to make accurate predictions but also to explain whether these predictions are obtained for the right reasons, namely those that can be justified to the stakeholders that are affected by these decisions. The explainability of model predictions is thus essential to the trustworthy use of DML models in cases where high-stake decisions are based on the result of these models. What is referred to as explainable ML (hereafter XML) is a novel methodology within the field of ML that aims at accounting for why (in the sense of for what reasons) DML makes their predictions (Ras et al. 2020). In recent years, while XML has become a leading research area and received some attention in the philosophical literature (Zednik and Boelsen 2020), its main aspects and tenets have not yet been sufficiently scrutinized. In this paper, I will lay out the main aspects of XML and characterize what is meant by explanation in the sense implied by XML. I will show that the contexts in which DML models are used impose explanatory requirements on how the predictions of these models should be explained by the methods of XML. I will argue that these explanatory requirements can be satisfied only when DML models themselves fulfill corresponding representational requirements. I will further argue that in order for the methods of XML to explain the predictions of DML models in ways satisfying their explanatory requirements they need to be supplemented with context-of-use specific analyses of these predictions. To support and illustrate these claims, I will offer case studies concerning the use of DML models in the context of healthcare where these models are increasingly used to make diagnostic decisions for chronic diseases.

Ras, G., Xie, N., M. van Gerven, and D. Doran, (2020). Explainable deep learning: A field guide for the uninitiated, arXiv preprint:2004.14545. https://arxiv.org/abs/2004.14545

Zednik, C. and Boelsen, H. (2020). The Exploratory Role of Explainable Artificial Intelligence. Paper presented at the 27th Biennial Meeting of the Philosophy of Science Association. http://philsci-archive.pitt.edu/18005/

How Localized are Computational Templates? A Machine Learning Approach

Maximilian Noichl

Philosophy, University of Vienna / University of Bamberg

Maximilian Noichl is a PhD-student in Philosophy, working at the University of Vienna in The Possible Life-Project (ERC) under the supervision of Prof. Tarja Knuuttila, and at the University of Bamberg in the Simulating Collective Agency-project (DFG) under the supervision of Prof. Johannes Marx. Coming from a background of HPS and Psychology, Noichl's research today is focused on applications of computational methodologies to philosophical problems, e.g. through the use of various data-mining techniques on scholarly articles, or the construction of agent-based models of scientific cooperation. He is also interested in the theoretical issues surrounding machine learning and data visualization in the sciences.

A commonly held background assumption about the sciences is that they connect along borders characterized by ontological or explanatory relationships, usually given in the order of mathematics, physics, chemistry, biology, psychology, and the social sciences. Interdisciplinary work, in this picture, arises in the connecting regions of adjacent disciplines. Philosophers of science have recently complicated this picture by highlighting connections between scientific disciplines orthogonal to these arrangements. In particular, the recognition of interdisciplinary similarities of models, which can arise through model migration or the convergent evolution of modeling practices, has shifted our image of what factors enable disciplinary contacts. Philosophers have analyzed these connections through notions such as computational templates [1, 2], model templates [3–5] and theoretical templates [6], citing the Lotka-Volterra, the Kuramoto-, and the Ising-model, various commonly used statistical distributions, and generative network models as primary examples. But most of these works have been done through case studies, which due to their focus struggle to provide foundations for claims about large-scale relations between multiple, ever-growing scientific disciplines.[7] As a supplement, in this contribution, we propose to philosophers of science the use of modern science mapping techniques in conjunction with techniques borrowed from mathematical information retrieval, to trace connections between modeling techniques in large parts of scientific literature. We explain how these techniques work, and apply them to a large, contemporary, and multidisciplinary data set (n=383.961 articles). One of the resulting graphics is reproduced here as Fig. 1. Through the comparison of textual to mathematical representations, we can find formulaic structures that are particularly likely to link different disciplines. We also develop a measure for the general strength and commonality of such relationships, which suggests that while there clearly is some thematic structure to the distribution of formulas in our sample, the broad distribution of mathematical forms is the rule, not the exception. Finally, we critically evaluate the relationship of this methodology to more traditional approaches in the philosophy of science and argue that one role of computational methods here can lie in the data-driven provision of an adequate set of metaphors.

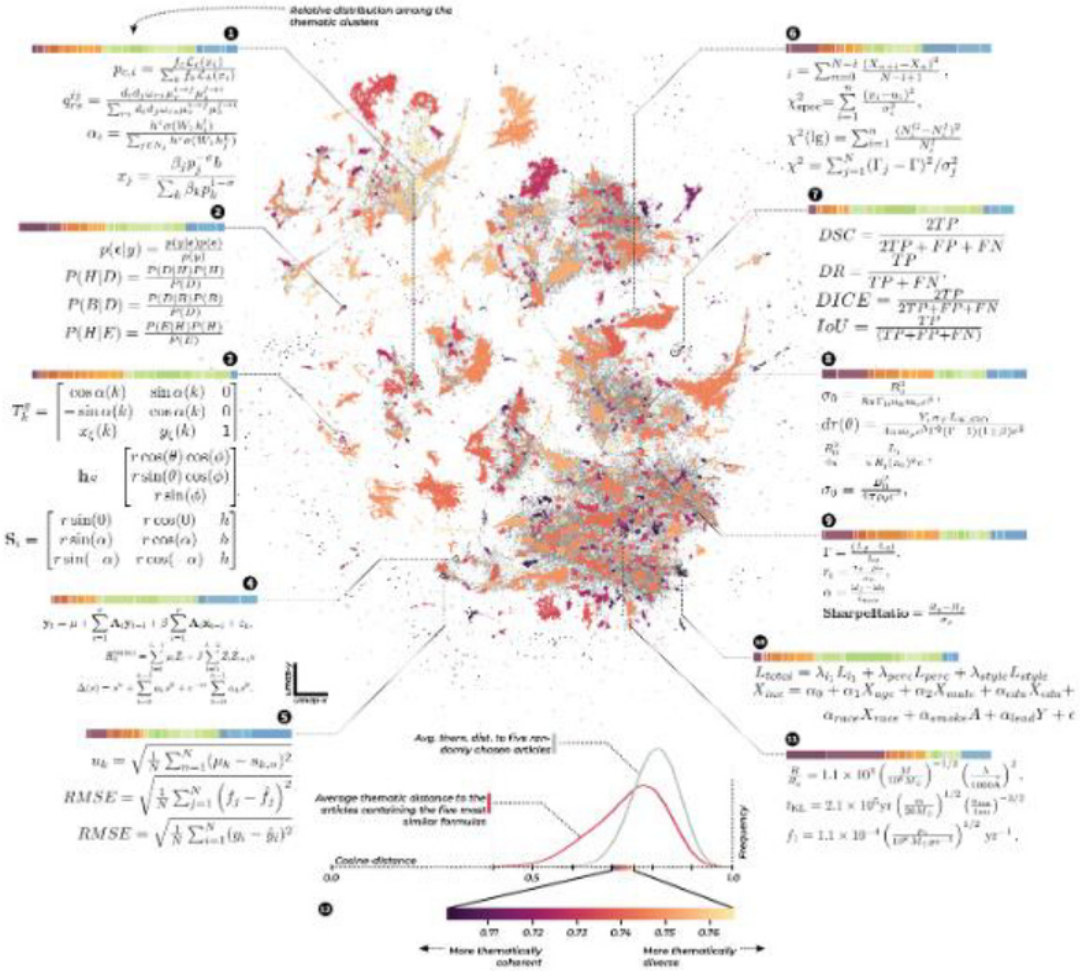

Figure 1: A mapping of 500.000 formulas by their similarity. A few clusters are annotated for illustration purposes with example formulas. We note several well-known patterns, such as, among others, Bayes' theorem (2), χ2-statistics (6), and the Root Mean Squared Error (5). In (12) we show the overall distribution of average thematic distances between the article from which each formula originates, and the articles of origin for the five closest articles, and compare it to a random selection of articles.

(1) P. Humphreys, "Computational Models", Philosophy of Science 69, S1–S11 (2002).
(2) P. Humphreys, Extending ourselves: computational science, empiricism, and scientific method (Oxford Univ. Press, Oxford, 2004), 172 pp.
(3) T. Knuuttila, A.-M. Rusanen, and T. Honkela, "Self-Organizing Maps as Traveling Computational Templates", in 2007 International Joint Conference on Neural Networks (Aug. 2007), pp. 1231–1236.
(4) T. Knuuttila and A. Loettgers, "Magnets, Spins, and Neurons: The Dissemination of Model Templates Across Disciplines:" Monist 97, 280–300 (2014).
(5) T. Knuuttila and A. Loettgers, "Model templates within and between disciplines: from magnets to gases – and socio- economic systems", European Journal for Philosophy of Science 6, 377–400 (2016).
(6) P. Humphreys, "Knowledge transfer across scientific disciplines", Studies in History and Philosophy of Science Part A 77, 112–119 (2019).
(7) L. Bornmann and R. Mutz, "Growth rates of modern science: A bibliometric analysis based on the number of publications and cited references", Journal of the Association for Information Science and Technology 66, 2215–2222 (2015).

A Metaphor Theory Based on Etymological Network Structure Analysis

A strong metaphor theory, started by Gianbattista Vico and evolved with variations but also common key elements by successors including Max Black, Blumenberg and Ricoeur, sees linguistic thought as a core connection of culture and epistemology. Language is not separable in literal and metaphoric. Instead it is formed as a network of metaphoric connections of varying conventionalisation. Formulating this line of thought in form of an empiric cognitive theory, Conceptual Metaphor Theory (CMT) views metaphor as a thought mechanism through which abstract topics are structured by means of concrete domains. However, so far CMT suffers from a lack of statistical real data analysis, as most research is based on small sets of hand-picked linguistic examples which leaves no room for systematic inference. In turn, we aim to present a refined metaphor theory based on statistical analysis of the metaphorical network underlying the English language. This is achieved by looking at the dataset of the MappingMetaphor project that can be naturally represented as a network of 414 lexical topic categories connected by directed metaphorical links.

Indeed we find that metaphors do form persistent cognitive and linguistic connections, which are significantly more likely to get reused in new metaphoric statements ones they are established. Thus, future changes in language are influenced by currently established metaphoric connections.

The global structure of the network is dominated by two anti-communities: concrete topics including spatial, bodily and mechanistic domains form one group and abstract topics including social structures and emotions, but also time related domains form another group. Compared with similar random networks, two mapping directions are dominant, mappings from the concrete into the abstract categories, but also mappings within the concrete group. Different to CMT expectations, the mappings are not throughout one directional but seem to obtain a systematically relevant symmetrical component. Finally, the connection pattern of the metaphor mapping data allows to assign each category a stable role by hierarchical clustering, which corresponds to the figurative conceptualization of this category in a semantic space. This way, we are able to represent the metaphoric semantic network structure.

Combining our findings with Ricoeurs view on metaphor we aim towards a new integrated picture: Abstract structures are not transferred by metaphors (CMT) but are products of a tensional connection between two topics, in which a similarity is created across the tension without dissolving it, forming the abstract structure as a third innovative persistent element of the mapping.

Mapping Metaphor with the Historical Thesaurus. Glasgow: University of Glasgow. Retrieved 12 November 2021, https://mappingmetaphor.arts.gla.ac.uk.
Lakoff, G., and Johnson, M. (1981). Metaphors we live by. University of Chicago Press.
Ricoeur, P. (2003). The Rule of Metaphor: The Creation of Meaning in Language. United Kingdom: Routledge.
Newman, M. E. J. (2010). Networks: an introduction. Oxford; New York: Oxford University Press. ISBN: 9780199206650 0199206651

Marie Teich

Max Planck Institute for Mathematics in the Sciences, Leipzig

Marie Teich is a PhD student at the Max-Planck-Institute for Mathematics in the Sciences in the group of Prof. Jürgen Jost. The topic of her project are Mathematical Methods of Metaphor Theory. She holds a Bachelor and Master degree in Physics from the University of Heidelberg. Other research interests are information theory, model inference, epistemology and philosophy of language.

Wilmer Leal

Computer and Information Science and Engineering, University of Florida

Wilmer Leal holds a Bachelor degree in Mathematics and a Bachelor degree in Chemistry both from Pamplona University and a PhD in Informatics from the University of Leipzig in cooperation with the Max Planck Institute for Mathematics in the Sciences in Leipzig. His main fields of interest are chemical space exploration, discrete mathematics, hypernetwork science, computational history of chemistry and categorical models of chemical reaction networks.

Jürgen Jost

Max Planck Institute for Mathematics in the Sciences, Leipzig / The Santa Fe Institute, Santa Fe, New Mexico

Jürgen Jost is a director at the Max-Planck-Institute of Mathematics in the Sciences in Leipzig. He studied Mathematics, Physics, Economics and Philosophy at the University of Bonn where he also received his doctoral degree in Mathematics 1980 and his habilitation in 1984. His current research topics cover topics in geometry, dynamical systems, theory of complex systems, language and cognition, economics and social sciences and philosophy and history of science.

Through the Looking-Glass, and What Women Found There: Conway, Cavendish, and Specular Metaphors of Self-Knowledge for Early Modern Women

Cesare Ripa's Iconologia (1603) depicted Scienza as a female figure with a looking glass, largely in line with the age-old but ambiguous trope of epistemic pursuit as seeing (with the soul/'mind's eye') through or in the looking-glass. Contemporary with Galileo's telescopic discoveries and the heyday of Venetian glass-mirrors, Ripa's image adumbrated the issues and disputes to proliferate around the specular metaphor/instrument over the course of the seventeenth century, what with the rise of Cartesian subjectivity and that of experimental philosophy. Against this backdrop, the present study explores Anne Conway's and Margaret Cavendish's writings, for their critical engagement with Cartesian and Hookean accounts of self-knowledge. Ripa's was a mirror held up to nature, not for Scienza's self-reflection, and it is Descartes who turned the epistemic mirror inward for the 'mind's eye' to find a 'clear and distinct' thought of itself, as surety for all ensuing knowledge about the natural world. The Cartesian mind as 'thinking substance' is (impossibly) at once the eye and the mirror. Conway also depicts the soul's self- knowledge in specular terms but predicates 'all reflection' firmly on a 'certain opacity, which we call body', and likewise, 'all knowledge' on a variety of such bodies as the 'subject or receptacle of that knowledge'. Perfect retentivity being the attribute of female body, Conway's 'subject' of knowledge is implicitly female, for the almost self-less self-knowledge that 'I, for example, am a multiple being who receives many images from objects'. A staunch critic of optic glasses, particularly Robert Hooke's microscope, Cavendish forgoes the glass metaphor entirely and instead has a 'young Lady' cross over to the Blazing World beyond the pole, as if 'through the looking glass' like Alice. Cavendish's imagining of (female) subjectivity is resonant with Conway's in that it is not reflexive but multiplicitous and relational, but for Cavendish (self-)knowledge is inherent, not retained, in body. Also, Cavendish's subjectivity is individual, instead of generic, for the Empress and the Duchess are no mirror image of each other but each an author of her own world/mind.

Siyeon Lee

English Studies, Gwangju Institute of Science and Technology

Siyeon Lee is professor of English at the Division of Liberal Arts and Sciences, Gwangju Institute of Science and Technology, Republic of Korea. She has been researching and publishing largely on the interconnections between the new science and literary discourse/imagination in seventeenth- to early eighteenth-century England, and is currently working on seventeenth-century women philosophers (Conway, Cavendish, Elisabeth of Bohemia, and Sor Juana). Her latest publications include: 'Colonial Discourse on Irish Dress and the Self as "Outward Dress"; Swift's Sartorial Self-Fashioning' (Eighteenth-Century Fiction, 2017), 'Somnium, The Man in the Moone, and Reading the Lunar New World in Post-Galileian Europe' (British and American Fiction, 2017), 'The Englishman in the New Worlds: Reforming Aliens and Savages in English New-World Fictions' (British and American Fiction, 2021) 'Libertas philosophandi and Cloistered Women in Margaret Cavendish's The Convent of Pleasure' (Eighteenth-Century English Literature, 2022).

Yeast Metaphors beyond Machines

Although many thinkers have discouraged the use of metaphors in describing natural phenomena due to their imprecision, numerous scientific theories have developed from analogies between studied phenomena and unrelated things and everyday practices (Kuhn, 1993). At the same time, each metaphor used in science not only significantly influences further investigation of the studied phenomenon but can also impact the cosmological visions, political decisions, social policies, and even what is perceived as "natural" and what is not (Larson, 2011).

This paper focuses on metaphors used in relation to yeast biology and yeast-based biotechnology. Yeasts are one-celled fungi that are instrumental in contemporary biotechnology and bioengineering. They are often discussed in scientific texts and scientific communication in mechanistic terms such as "cell factories," "molecular machineries," "yeast chassis," and so forth. Although widely accepted, such machine-related metaphors referring to microbial fungi are problematic, as they systematically disregard some of the characteristics of living beings, limit the ways they are studied (Nicholson, 2014), and, essentially, convey a vision of life as fully controllable (Boldt, 2018; Vaage, 2020). In the context of ecological issues, treating living beings as machines creates overreliance on technological and biotechnological solutions to mitigate environmental crises (Boldt, 2018). At the same time, necessary socio-political transformations and changes in production and consumption are set aside. Moreover, the omnipresence of mechanistic language in biotechnological discourses inhibits the introduction of other visions and alternative figures of speech in yeast research.

In contrast to the dominance of machine metaphors and mechanistic language, this paper, drawing on the work of Nora Vaage (2020), will discuss yeast metaphors and conceptions created and conveyed by contemporary art practices with yeasts. I will examine artworks that playfully engage with the notions of control and randomness and develop procedures in which the fungi grow beyond artistic control. Analyzing how these projects apply DIY and biology methods, I will argue that these works go beyond the perception of yeasts as controllable "molecular machineries" and open up diverse avenues for the conceptualization of yeasts.

Olga Timurgalieva

Creative Media, City University of Hong Kong

Olga Timurgalieva is a Ph.D. candidate at City University of Hong Kong and a former visiting researcher at King's College London. Awarded by the Hong Kong Ph.D. Fellowship Scheme, her research investigates the intersections of biotechnology and contemporary art, with a particular focus on fungal microbes and their interspecies relations. Olga has published writing in Performance Research. A Journal of the Performing Arts.

Boldt, J. (2018). Machine metaphors and ethics in synthetic biology. Life Sciences, Society and Policy, 14(1), 1–13. https://doi.org/10.1186/S40504-018-0077-Y/METRICS

Kuhn, T. S. (1993). Metaphor in science. In A. Ortony (Ed.), Metaphor and Thought (2nd ed., pp. 533–542). Cambridge University Press. https://doi.org/10.1017/CBO9781139173865.024

Larson, B. (2011). Metaphors for Environmental Sustainability: Redefining Our Relationship With Nature. Yale University Press.

Nicholson, D. J. (2014). The machine conception of the organism in development and evolution: A critical analysis. Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences, 48, 162–174. https://doi.org/https://doi.org/10.1016/j.shpsc.2014.08.003

Vaage, N. (2020). Living machines: Metaphors we live by. Nanoethics, 14(1), 57–70. https://doi.org/10.1007/s11569-019- 00355-2

Modelling Temperature as a Continuous Function: Lessons from Thermal Physics

Aditya Jha

Applied Mathematics and Philosophy, University of Canterbury

There is a commonly held misconception that temperature varying across a region of space or time can always be modelled as a continuous analytic function. I argue against this misconception by demonstrating that the idealization of temperature as a continuous function does not necessarily hold in our best scientific representations of the world, and its continuity, where applicable, is a contingent matter. To this end, I examine three inter-related cases in the study of heat flow, and show how this point holds generally for modelling other physical variables as a (dis)continuous variable.

The three case-studies are:

a) phase transitions in evaporative processes leading to temperature discontinuities across water droplets (Fang and Ward 1999; McGaughey and Ward 2002);

b) temperature and velocity jump at walls in fluid flows such as in micro-channels (Colin 2014); and

c) thermal boundary resistance across solid-solid, solid-liquid or liquid-gas interfaces leading to temperature discontinuities (Cahill et al 2003; Chen et al 2022).

In (a), I review the experimental evidence of the existence of significant temperature discontinuities (of as much as 8 K) across evaporating water droplets. I then demonstrate how modelling temperature as a continuously varying function often leads to incorrect predictions of temperature profiles across evaporating droplets. I further show how removing the 'continuity' idealization has significantly improved the predictions of evaporation models.

In (b), I show how slip flows and breakdown of local thermal equilibrium near boundary layers in fluid flow invalidate the continuity assumption. This is because the representative sample volume over which temperature can be averaged as a macroscopic variable is no longer suitable due to significant microscopic fluctuations of the fluid flow parameters.

In (c), I demonstrate the temperature discontinuities across material interfaces resulting from the reflection and scattering of thermal carriers lead to a breakdown of local thermal equilibrium. I then discuss how this invalidates the idealization of temperature as a continuous variable in thermal boundary resistance models.

I discuss how some of the difficulties stated above arise from the extension of the scientific concept of temperature from equilibrium regimes (the domain where it was originally envisaged) to non- equilibrium regimes (where ongoing work on the definition of temperature challenges some of our intuitive notions of temperature). I conclude the discussion by noting that temperature can seldom be defined in many such situations, much less can anything necessarily be said about its continuity, and that this has consequences for modelling of physical variables in general.

I am a final year PhD Candidate in Applied Mathematics and Philosophy at the University of Canterbury, New Zealand, and a Research Fellow at the Institute Vienna Circle, University of Vienna. I was recently a Visiting PhD Student at the Department of History and Philosophy of Science at the University of Cambridge, UK, and will be a Visiting PhD Student at the Department of Philosophy at the Massachusetts Institute of Technology, USA. I mainly work on topological explanations of physical phenomena investigating the claim whether these models constrain our world in any metaphysical sense. Part of my argument against such a speculation was published recently in Synthese (https://doi.org/10.1007/s11229-022-03697-9). Currently, I am looking into temperature discontinuities, the definition of temperature in non-equilibrium regimes and their implications for topological explanations.

“Literature” of Science: Reading Science as an Institutionalised System of Knowledge in Contemporary Indian Fiction

Anand Abhinav

English Literature, Indian Institute of Technology, Kanpur

Abhinav Anand is a Ph.D. candidate at the Indian Institute of Technology, Kanpur, India. His Ph.D. research falls under the area of Literature and Science and looks at how fiction deals with the epistemology of science in the contemporary Indian context. He has worked as the Research Assistant for the GOTHELAI project led by the University of Sussex on gender mainstreaming in Higher Education. He was the recipient of the 2020 Sahapedia-UNESCO Fellowship, where he worked on the intersection of gender and caste in Bihar’s ‘Naach’ folk theatre tradition. He is interested in the areas of Literature and Science, Science and Technology Studies, Indian Literature, Feminist theory and activism, and critical theory.

This paper aims to analyze the myriad ways in which science and scientific knowledge can be assessed, critiqued, questioned, and (re)defined through a critical reading of two contemporary Indian novels: Signal Red (2005) by Rimi B. Chatterjee and Serious Men (2010) by Manu Joseph. The novels primarily locate the discourse of science within the structures of education (St. Andrews school in Serious Men) and research (Institute of Theory and Research in Serious Men and “The Centre” in Signal Red), highlighting how these educational structures are controlled by the matrix of caste, class, and gender hierarchies, which it further perpetuates. One of the obvious interactions between Science and Literature is witnessed in the category of ‘Science Fiction’. However, texts like Serious Men and, to some extent, Signal Red fail to satisfy the necessary and sufficient condition to be categorized as science fiction. The analysis of the existing relationship between science fiction and science (in the area of science fiction studies) highlights that science is generally defined as a field of knowledge in terms of its method, content and function, which, in a literary analysis, reflects in the form and content of science fiction. Thus, science becomes the base on which science fiction as a category develops. This paper departs by challenging the prominence given to science in science fiction studies and instead forges a new relationship which is premised on defining science as an institutionalized system of knowledge production, i.e., a system of knowledge produced within an institutional framework. Given this, these novels fall better in the loose “fiction about science” category. In order to understand this new relationship between science and “fictions about science”, the paper employs the theoretical framework of ‘critical science studies’, borrowing specifically from the postcolonial and Marxist perspectives. Through the framework of ‘critical science studies’, the paper aims to raise questions about the institutionalized nature of scientific knowledge determined by various socio-political factors like the interventions by the state, the politics of caste, which is specific to the Indian context, religious fundamentalism, and gender(ed) biases. Moreover, the paper also highlights that some of the core methods of science are premised on violence, such as vivisection and triage, as depicted in the two novels. Thus, this paper works with the tools provided by ‘critical science studies’ to understand how literature interacts with the epistemology of science and, in the process, challenges (our understanding of) it.

Thought Experiments, Literary Narrative, and Science Fiction: The Example of Isaac Asimov's Robot Cycle

Simona Bartolotta
English Literature, University of Oxford

Simona Bartolotta received her BA at the University of Bologna and her MA at the Ca' Foscari University of Venice, and is currently a DPhil Candidate in English at the University of Oxford. Her doctoral dissertation seeks to develop a post-critical approach to science fiction, attempting to lay the foundations for an analytical framework that enables an aesthetic and critical contextualization of this genre outside of critical theory. To this end, the dissertation traces a counter-history of science fiction through the lens of the genre's affinities and intersections with multiple forms of crime fiction (occult, classic, and metaphysical detective fiction, the hardboiled, noir). She has published papers in English and Italian about science fiction, post-critique, and cognitive studies, and the ethics of form in science fiction.

This paper offers a reflection on the possibility, at the center of several recent interventions in cognitive and philosophical approaches to literature and epistemology (as made for example by David Egan, Catherine Z. Elgin, Tamar Szabó Gendler, Nancy J. Nersessian, and Roy Sorensen), of envisioning literary fiction in analogy with the rhetorical and formal mode of the thought experiment. Insofar as thought experiments have served and continue to serve as valued epistemic tools of philosophical and scientific enquiry, associating literary narrative to the logic of thought experiments means becoming involved in the question of literary cognitivism, broadly defined as the claim that literary texts can be a source of knowledge. Literary cognitivism investigates both the ways in which literature transmits knowledge (for instance, propositionally or via a more oblique epistemic action, be it practical, phenomenal, or affective), and what are the kinds of knowledge that can be successfully transmitted by the literary artifact (moral and ethical understanding, conceptual knowledge of possibilities, empathic skills and role-taking imagination, etc.). The study of thought experiments has evidenced similar questions with regard to the epistemic validity of the form, establishing the grounds for the critical comparison of literary fictions and thought experiment.

This paper seeks to develop these investigations into a new direction by focusing on the case of science fiction literature, which, in its characteristic investment in specific theoretical frameworks and branches of human knowledge (from the hard to the social sciences, from technology to psychology), arguably shows more affinity with the logical and epistemic rigor expected of a thought experiment than mainstream or realist literary fiction. In particular, the paper will have as its key case study Isaac Asimov's Robot Cycle (comprised of four novels and several short stories), which, the paper argues, deploys its thought-experimental character in a specific form of a-chronological and non-linear seriality, an unusual formal configuration that Asimov unifies through a consistent thematic concern with the future of the human species, technoscience, and the nature of mind. Evidencing the relevant analogies that exist between literary narrative and thought experiments reveals that it is only by reading the Robot stories as an ensemble – a collection of meaningful variations – that the rationale of their artistic design truly emerges; reciprocally, the design of the Robot stories suggests and exemplifies the benefits of envisioning narrative as thought experiment. The broader outcome of this analysis will be to define narrative fiction as endowed with the same kind of pseudo or 'aimless' argumentative power that is proper to thought experiments.

Queering Romantic AI: The Shelleyan Wandering Jew in Asimov's Bicentennial Man

This essay aims to explore the interrelationship between Romanticism, queer studies and AI issues, particularly to expand Romantic studies to the field of AI and employ a queer reading to analyze AI narratives in Isaac Asimov's The Bicentennial Man (1976). The image of the Wandering Jew that British Romantic poet Percy Bysshe Shelley revealed in his work is unconventional and helps to examine the quest for love in Andrew, the creative and affectionate robot in Asimov's classic robotic novelette titled The Bicentennial Man. Asimov is one of "big three" hard science fiction writers as well as a professor of biochemistry. The term "robotics" he coined leads science fiction studies in robots to the field of robotic technology. The "positronic brain" in his robots is the origin of the robot's consciousness and this different brain or mind becomes a metaphor to instigate a queer discourse.

Echoing Romantic ideas of love (cf. Byron, Shelley, Keats), Asimov depicts Andrew's emotional transformations in pursuit of freedom, lust and love. Those complex emotions are showcased in the history of queer and LGBTQ community. Apart from breaking shackles of politics, religion, and gender, the core theme of Romanticism has an incomparable longing for the ideal romantic love. Therefore, my reading of science fiction texts of robots helps to connect the science fiction genre with traditional Romantic studies. The essay specifically exemplifies the Shelleys' texts, including Alastor and Frankenstein, in a bid to expand the field of traditional Romantic research into the field of AI and finally introduces a queer reading to AI narratives.

I will sketch out three aspects for further discussion. Firstly, I will compare Asimov's Bicentennial Man and Mary Shelley's Frankenstein in hopes of connecting AI narratives to Romantic studies. Secondly, I will employ the Shelleyan Wandering Jew to scrutinise Asimov's novelette, The Bicentennial Man, to demonstrate their unconventional worldviews and pursuit of love. At last, this essay will find a connection between AI narratives and Romanticism from a queer perspective and use the robot "Andrew" as a metaphor for the LGBTQ community to think about sexual liberation and gender construction.

Terence Shih

English Studies, St. John's University, Taiwan

Terence H. W. Shih is Associate Professor at the Department of Applied English, St. John's University, Taiwan. He received a PhD degree in English literature from the University of Durham, UK. His thesis, entitled "'Airy Children of Our Brain': Emotion, Science and the Legacy of Eighteenth-Century Philosophy in the Shelley Circle, 1812–1821," examines emotion by drawing on the Shelley circle's texts and eighteenth-century science and philosophy. His research focuses on Romantic literature, scientific culture, neuroscientific historicism, and the materiality of the mind and emotion. His major monograph is entitled Desire and Technology in Science Fiction and Beyond (2016).

Next to Human: Proximity and/as Measure of (Post)Humanity

Rachel Tay
Literary Studies, Duke University

Rachel Tay is a PhD student in Duke's Graduate Program in Literature. Her work centers the philosophy of media, political economy, and configurations of cognitive capitalism in contemporary digital culture. Specifically, she is interested in the digital architecture of attention as well as its implications on processes of knowledge and cultural production.

"From whence in general," questions Martin Heidegger in his critique of Kant and the Problem of Metaphysics, "do we lay hold of the point of view from which to determine Being as such" (153). For Heidegger, as for a lineage of post-Kantian thought, the problem of any philosophical inquiry on existence is a problem of positionality: just as "to understand" is "to project oneself upon a[nother] possibility," the essence of Being can only be known in one's transcendence of being itself (BPP 277). In this regard, the "being" of humanity can only be invoked as an elusive magnitude by which we measure ourselves, and it is in being drawn into "the nearness of Being '' that we come to articulate ourselves as such (LOH 222). Such an indeterminacy in our concepts of humanity has long been asserted, particularly in the wake of French post-structuralism. Likewise, the pernicious effects of our historical attempts at stabilizing this capricious term – by defining it in negative relation to other entities – has been variously problematised in decolonial, queer, and feminist circles. Nonetheless, this obscure measure of "humanity" continues to abide in our current discourses of anti-, in-, and posthumanity.

Perhaps we remain in thrall to the "human" for it has undoubtedly captured and monopolized our onto- epistemological terrain; perhaps "the West," as Sylvia Wynter suggests, has indeed "brought the whole human species into its hegemonic … model of being human" (21). But perhaps, as this paper contends, this propensity to measure and render approximate is precisely what makes us "human": it is by this tendency to compare, and through comparison draw into proximity separate domains, that we come to imagine, limn, and recognise the world. To be certain, this is not to recapitulate Wynter's delineation of the "human as a hybrid-auto-instituting-languaging-storytelling species" – descriptive representation is only a manner of measurement (25). Rather, what this paper suggests is that our proclivity towards likenesses, and the adjacent premise that "everything is like everything in some respect," instantiates a fundamental posture of "enlikening" characteristic of humanity (Hume 37). Drawing on Francois Laruelle's idiom of "cloning," which functions a transcendental medium for the real to be thought, and Paul North's reformulation of "the logic of likeness" – as contiguity, not congruity – it asserts that our inclination towards likeness is what not only distinguishes the human qua human, but also capacitates our "replication and rereplication" of our all-too-human senses of the world (281). Centering affinity rather than difference as our basic orientation towards the world, such a reconfiguration of human onto-epistemology thus attempts to untether our understanding of ourselves from any requirement of antinomy, antagonism, or hierarchy.

Heidegger, Martin. Kant and the Problem of Metaphysics, Translated by Richard Taft, Indiana University Press, 1997. ———. "Letter on Humanism," Basic Writings, Edited and translated by David Farrell Krell, Harper and Row, 1977. ———. The Basic Problems of Phenomenology, Translated and introduced by Albert Hofstadter, Indiana University Press, 1982.
North, Paul. Bizarre-Privileged Items in the Universe: the Logic of Likeness. Zone Books, 2021.
Wynter, Sylvia. On Being Human as Praxis, Edited by Katherine McKittrick, Duke University Press, 2015.

Spherical Geometry in Euclid's Phaenomena

Christian Thomé

Classical Philology, University of Wuppertal

My PhD thesis mainly aims to clarify, as far as possible, the history of the transmission of the Phaenomena by tried and tested philological means. This project, however, is by its very nature highly cross-disciplinary; therefore, it poses some questions that fall outside my field of study: Of what use might this branch of knowledge have been – up until the early modern period – after (spherical) trigonometry had been discovered? Why and in what way do the diagrams differ from each other and interact with the text? To what extent did scribes not only copy but also revise the text (and the diagrams)?

The geocentric sphere-model of the cosmos first came to be accepted in ancient Greece from the 6th century BC. One of the earliest 'proofs' of the view that the earth lies at the centre of the cosmos are found in the first theorem of Euclid's Phaenomena (300 BC). Perhaps somewhat strangely, this proof follows an introductory chapter whose very first sentence also establishes geocentrism – not only geometrically but also by employing the rhetorical strategy of a long and syntactically complex sentence. Even the theorems, the language of which is a most technical one, do not entirely do without 'literary' features. Furthermore, the treatise seems to be situated within a theological context, as is betrayed by an allusion to a Platonic notion regarding the motion of stars. These aspects of the text have not yet been studied thoroughly.

The kind of mathematics that is applied in the Phaenomena is based on and intricately connected with Theodosius of Bithynia's Spherics (2nd century BC); it could be described as 'non-trigonometrical spherical geometry' and makes use of its own unique qualitative concepts.

While armillary spheres were probably widely used in Antiquity to facilitate comprehension of celestial phenomena in general, I believe that they would not have been helpful to students of the more complex theorems of the Phaenomena. At the same time, it would in most cases have been practically impossible to draw (manually) the cosmos sphere in perspective. This is likely to be the reason why the diagrams we find in the manuscripts project the sphere-model onto the plane; 'rules' as to how these projections are to be carried out or understood differ from theorem to theorem and are nowhere explicitly stated.

Scientific Knowledge as Ascent to the Light. On the Literary Method of Dante Alighieri and Johannes Kepler

Laetitia Rimpau
German Literature, University of Wuppertal

Kepler writes in his Short Exposition of Copernican Astronomy (Epitome), “I believe that the truth about mutable nature can be taught quite easily.” One facet of Kepler’s (antique) idea of education, which is also addressed to laymen, is the doctrine of spheres. Those seeking scientific knowledge, move up on “spiritual” planetary orbits towards the “sun”. The basic structure of this teaching and learning process dates back to Plato’s Timaeus. It is a literary-philosophical method, which was also adopted by astronomers like Copernicus and Kepler. Dante was one of the first early Renaissance authors to apply this ascension model to his scientific poetry: In The Banquet, he discusses theoretically what it means. In The Divine Comedy (1321), he describes his allegorical educational journey to divine light poetically, with the lay audience in mind. Three hundred years later, Kepler concludes in The Harmony of the World (1619) with an epilogue to the sun. In this book, he formulates his Third Law of Planetary Motion and describes the discovery as a mental process. The Rudolphine Tables (1627), his last work, he prefaces with an allegorical picture-poem in which he explains astronomical history to the layman and recounts his rise from Brahe’s assistant to the discoverer of Copernican-Keplerian Astronomy as an ascent into the sphere of light. The central questions of my lecture are: What are the similarities and what are the differences between the “journeys of knowledge” of Dante, the poet fascinated by astronomy, and of Kepler, who wrote scientific poems since the beginning of his career?

Patterns of science in 19th century Greek literature

George Vlahakis
Physics and History of Science, Hellenic Open University, Athens

Greek literature during the course of the 19th century is considered as an amalgam of masterpieces and naïve philological exercises. Using metaphorically the well-known Vladimir Ilyich Ulyanov's expression, Greek literature of that time, premature as it was, appeared to have all the signs of a "childhood illness". Nevertheless, some of the novels and poems written at that time by Greek authors deserve a more thorough examination, not only because of their literary value but also because one may find there some interesting patterns of science.

It is interesting to note that in fact the development of the new scientific theories that appeared in 19th century and of the Greek literature followed parallel roads, therefore in a way the development of the first is mirrored in the evolution of the latter.

Another noteworthy point is the use of theories, now being in the milieu of pseudoscience, as vehicles to describe and explain certain episodes in these literary works.

In the present paper, we aim to use the works of certain Greek writers of the period, like Emmanuel Roides (1836–1904) and Platon Drakoulis (1858–1942), as case studies for the examination of the way they use science and scientific themes in their texts. We shall discuss subjects like evolution, aether, mesmerism and gender on the one hand and technological innovations like telephone, cinema, electric lighting and x-rays on the other trying to examine if there are certain patterns of scientific and technological subjects, which are evident in the above-mentioned literary works.

On the Coincidence of Change in Science and Culture

Dirk Vanderbeke

English Studies, Schiller Universität Jena

Dirk Vanderbeke studied German and English Literature at the University of Frankfurt/Main from where he also received his doctorate degree in English Literature in 1994. His doctoral thesis, Worüber man nicht sprechen kann (Whereof One Cannot Speak), discusses aspects of the unrepresentable in philosophy, science and literature. His habilitation study, Theoretische Welten und literarische Transformationen (Theoretical Worlds and Literary Transformations) examines the recent debate about 'science and literature' and science's role(s) in contemporary literature. He has published on a variety of topics, e.g. James Joyce, Thomas Pynchon, John Milton, evolutionary criticism, physics and literature, science fiction, self-similarity, vampires and graphic novels. In addition, he has co-edited an annotated edition of the German translation of James Joyce's Ulysses, published in celebration of the Bloomsday centenary. Dirk Vanderbeke has taught at the University of Wisconsin – Milwaukee, the University of Frankfurt/Main, Widener University in Chester, PA, the University of Greifswald, the Abstracts SLSAeu '23 University of Stuttgart, the University of Paderborn and from 2007 to 2019 as a permanent guest professor at the University of Zielona Góra. Since 2007 he is professor of English studies at the Friedrich Schiller University in Jena.

Very late, on page 967 of his massive theoretical work The Structure of Evolutionary Theory, Stephen Jay Gould spells out what had already been indicated by the title of the book and various references in the text:

[I]f I were to cite any one factor as probably most important among the numerous influences that predisposed my own mind toward joining Niles Eldredge in the formulation of punctuated equilibrium, I would mention my reading, as a first year graduate student in 1963, of one of the 20th century's most influential works at the interface of philosophy, sociology and the history of ideas: Thomas S. Kuhn's The Structure of Scientific Revolutions (1962).

For many of his readers this did probably not come as a surprise; various structural elements of Kuhn's concept of scientific developments and change were recognizably replicated in the theory of a punctuated equilibrium, even though, of course, the triggers, the time scale, and the mechanics of the relatively rapid changes differ considerably. In the course of natural history there is no equivalent to the anomaly in scientific research; a rapid change in evolution still takes immense time; and, of course, the human factor – socially, psychologically, and linguistically – is missing in evolutionary history.

The concept of a punctuated equilibrium was first formulated by Gould and Eldredge in 1972, that is at a time when some momentous cultural changes were in progress – changes that would soon find their equivalence in Gould's own field of science, i.e. Paleontology.

It is difficult to see how these phenomena could be directly related, but they are in many ways similar, and in my paper I want to ask the question whether this is just coincidental or the result of a major shift in the history of ideas. Were the changes in scientific perspectives based chiefly in new discoveries, or did they respond to cultural re-orientations and the impact of something that, in lack of a better word, could be called the zeitgeist.

The changed perspectives concern in popular culture the representation of the monster, the outlaw, the American natives, and the alien, in academic discourse the oriental, and in Paleontology dinosaurs and Neanderthals – the list is not complete. The process started in the 1960s and reached a preliminary conclusion in the 2000s, but then it is also still ongoing. In all of the cases, forms of Othering are replaced at least to some extent by a reverse-Othering, and members of the previously inferior and/or morally questionable category are vindicated and re-conceptualized as at least equal if not superior to the normative class. In my paper I want to explore – necessarily briefly – some of these developments and also raise the question whether they possibly follow the pattern of a scientific revolution and/or the evolutionary model of a punctuated equilibrium.

Conjuring a Sense of Order: Pattern as a Figure of Knowledge in Armin Nassehi's Theory of Digital Society

Stephan Besser
Literary Studies, University of Amsterdam

Stephan Besser is assistant professor of Literary Studies at the University of Amsterdam and a researcher at the Amsterdam School for Cultural Analysis (ASCA). He is the author of Pathographie der Tropen: Literatur, Medizin und Kolonialismus (2013) and one of the series editors of Experimental Practices: Encounters across Arts, Sciences and Humanities (Brill). Forthcoming publication: Worlding the Brain: Interdisciplinary Explorations in Cognition and Neuroculture, ed. with Flora Lysen (Brill 2023).

In this paper I will employ a close reading of sociologist Armin Nassehi's book Muster: Theorie der digitalen Gesellschaft (Patterns: Theory of Digital Society) as case study for a reflection on the epistemico-aesthetic concept of figures of knowledge. I will demonstrate how the epistemic and aesthetic implications of "pattern" as such a figure shape Nassehi's claims regarding the "stupendous regularity" of digital society and show how figures of knowledge in general can be seen to affect the production of scientific knowledge in a way that is related to, but also different from metaphors.

Armin Nassehi is one of the leading and most influential sociologists working in Germany today. In his book Muster: Theorie der digitalen Gesellschaft (2019) he offers a functionalist explanation of the tremendous success and rapid dissemination of digital technologies in late modern societies. Working in the tradition of Luhmannian systems theory, Nassehi describes digitization as a socio-technological process that is able to make society more transparent to itself because it is based on the same operating principles as digital technologies, namely the generation of highly complex forms from simple, binary patterns. Drawing on David Berry's notion of a postdigital "pattern aesthetics", I demonstrate how Nassehi aesthetically and rhetorically aligns descriptions of social, digital and neuro-cognitive patterns in such a way that they appear as expressions of a larger, orderly isomorphism of patterns. This use of the figure of pattern is essential in his critique of theories that emphasize the liquid character of late modernity (Baumann et al.) and the disruptive quality of digitization (Zuboff et al.) and supports his own notion of digital society as an extremely orderly and stable affair.

Drawing on recent research in philosophy, literary studies and the history of science, I define figures of knowledge as key terms in the production of knowledge that combine conceptual with figurative meaning, with the latter including both imagery (in the sense of figurative language) and figuration (in the sense of spatio-temporal arrangement and material shape) (Müller; Konersman). Importantly, this definition includes the element of metaphor but also goes beyond it. My reading of Nassehi is intended to demonstrate how of figure of knowledge approach can enrich recent discussions of the aesthetic and epistemic uses of imagination (Badura & Kind).

Badura, C. & A. Kind, Epistemic Uses of Imagination. Routledge, 2021.
Berry, D., "The Postdigital Constellation", in: Berry, D. & Dieter, M. (eds.), Postdigital Aesthetics. Art, Computation and Design, Palgrave Macmillan, 2012, 44–57.
Besser, S., "Binding Brain, Body and World: Pattern as a Figure of Knowledge in Andy Clark's Work on Predictive Processing", in: Poroi 17, 2021, 1.
Dixon, D., "Analysis Tool or Research Methodology: Is There an Epistemology for Patterns?", in: Berry, D. & Dieter, M. (eds.), Postdigital Aesthetics. Art, Computation ns Design, Palgrave Macmillan, 2012, 191–209.
Konersman, R., "Vorwort: Figuratives Wissen", in: R. Konersmann (ed.), Wörterbuch der philosophischen Metaphern, WBG, 2011, 7–20.
Müller, E., "Figur, figürlich." Trajekte: Zeitschrift des Zentrums für Literatur- und Kulturforschung Berlin 8, 20008, 16), 18– 21.
Nassehi, A., Muster. Theorie der digitalen Gesellschaft. München, C.H. Beck, München, 2019.

Theology between Models and Metaphors. A Model-based Scientific Theology Facing Biblical Narratives and Personal Belief

Dominik Baumgartner
Theology, LMU München

Dominik Baumgartner studied archaeology, philosophy and catholic theology at the LMU Munich. He is a research assistant at the chair of dogmatics and ecumenical theology at the LMU Munich. His PhD-project is about the method of model-building in theology.

Theology, like no other science, faces the challenge of reconciling metaphorical speech and theorybased models. Especially Christian theology, which refers to the Bible (a text corpse containing different kinds of metaphorical narratives some of them contradicting each other) as its Holy Scripture and normative foundation, is repeatedly challenged to transfer the metaphorical speech about God and narrative texts into theories and models.

In doing so, it is (at least in the majority) positively and appreciatively disposed towards both methods of speaking and thinking about God, because it is guided by the insight that personal belief and religious experiences is expressed primarily in narrative metaphorical terms, while the epistemic representation and propositional expression of religious convictions is reflected primarily in theories and models. Thus, on the one hand, a theology that wants to take seriously people's beliefs has to transform their often narrative and metaphorical expression into truth-valuable propositions (metaphor à model: scientific theology) and, on the other hand, to express theoretical axiom systems in intersubjectively comprehensible images (metaphor à model: catechesis).

In my presentation I would like to show how the theory of a creation out of nothing shows up in biblical metaphors and narratives and how the theological insight of the createdness of creation was transferred into theory-based models. To this end, I use the first Christian councils to show how the metaphorical narrative of the creation accounts was translated into propositional dogmatic theories and how different aspects of these theories were modeled differently in the history of theology. To this end, I draw as examples the so-called "proofs of God" of Thomas Aquinas (also known as The Five Ways) and its formalized model of Kurt Gödel's ontological argument.

The central argument of my presentation is that theological metaphors and models can be translated with benefits into each other, each revealing and illuminating different theological aspects. Theological knowledge can thus be understood as the translation of the relationship of subjects with God expressed in metaphors and metaphor networks (that is, narratives and stories) into coherent theories that are tested by means of models. In doing so, models reveal individual aspects implicit in metaphors and bring them together with other aspects (from other metaphors) and test their coherence and plausibility.

So theological insights find their ways into theology as metaphors or models which is – in my opinion – a big methodological advantage but needs epistemological reflection.

Functional Similarities and Differences Between Analogical Thought in Literature and Science

Roland Bolz
Philosophy, Humboldt University Berlin

Roland Bolz is a PhD student in philosophy at Humboldt University Berlin, working on a functionalist theory of metaphor and analogy under the supervision of Prof. Michael Beaney. He has an MA in philosophy at Humboldt, as well as an MA in media & communication from European Graduate School. His research interests include the philosophy of language, semantics, semiotics, and logic.

This paper presents a functional perspective on different varieties of analogical (or metaphorical) thought. Arguably, analogical thinking is most virtuosic in a) the semantic creativity and sustained 'world-building' of narrative fiction (always potentially serving as a fresh point of comparison with the actual world, if you will), as well as in b) the rigorous analogies that at times, guide scientific progress towards new paradigms.

The question that this paper takes up is: what kind of general theory of analogical thought can adequately describe the similarities and differences between these exemplary forms of analogical imagination? Although there has been great interest and emphasis on the centrality of analogical thought for human cognition and understanding in recent decades – most notably in cognitive linguistics with conceptual metaphor theory and blending theory –, these theories do not offer a vocabulary to account for the very diverse range of functions of analogical thinking. It appears to be insufficient to merely conclude that there is 'something of' the aesthetic, literary, or imaginative happening in the scientific mind, or vice versa, that there is something along the lines of scientific modeling at work in the novel. At the same time, one should not expect the boundaries between such cognitive products to be too clean. The functional theory of analogical thought and language, as under development in the present author's PhD thesis, aims to account for the diversity of these functions on the basis of a functionalist theory of meaning, drawing among others from Ruth Millikan's biosemantics. A key idea of the resulting theory is that representational activity can serve a range of functions, and that its meaning is to be understood against the background of such functions. Because these functions (e.g. mental modeling, efficient communication, facilitating memory, social distinction, etc.) are grounded in in different parts of the overall social ontology of the theory of meaning, we say that meaning itself is multiply grounded. Applied to analogical discourse, these functional rubrics become the foundation for a conceptual apparatus which allows us to distinguish meaningfully between different genres of analogy-making.

Drawing on recent research in philosophy, literary studies and the history of science, I define figures of knowledge as key terms in the production of knowledge that combine conceptual with figurative meaning, with the latter including both imagery (in the sense of figurative language) and figuration (in the sense of spatio-temporal arrangement and material shape) (Müller; Konersman). Importantly, this definition includes the element of metaphor but also goes beyond it. My reading of Nassehi is intended to demonstrate how of figure of knowledge approach can enrich recent discussions of the aesthetic and epistemic uses of imagination (Badura & Kind).

Bartha, Paul. By Parallel Reasoning. Oxford: Oxford University Press, 2010.
Fauconnier, Gilles, and George Lakoff. "On Metaphor and Blending." Cognitive Semiotics 5, no. 1–2 (2009): 393–99.
Fauconnier, Gilles, and Mark Turner. The Way We Think: Conceptual Blending and the Mind's Hidden Complexities. New York: Basic Books, 2002.
Frigg, Roman. Models and Theories: A Philosophical Inquiry. London, New York: Routledge, 2023.
Gentner, Dedre, and Arthur B. Markman. "Structure Mapping in Analogy and Similarity." American Psychologist 52, no. 1 (1997): 45–56.
Harder, Peter. Meaning in Mind and Society: A Functional Contribution to the Social Turn in Cognitive Linguistics. Berlin, New York: De Gruyter Mouton, 2010.
Hesse, M.B. Models and Analogies in Sciences. Notre Dame: University of Notre Dame Press, 1966.
Hofstadter, Douglas, and Emmanuel Sander. Surfaces and Essences: Analogy as the Fuel and Fire of Thinking. New York: Basic Books, 2013.
Knuutila, Tarja, and Andrea Loetgers. "Varieties of Noise: Analogical Reasoning in Synthetic Biology." Studies in History and Philosophy of Science 48 (2014): 76–88.
Kurz, Gerhard. Metapher, Allegorie, Symbol. Göttingen: Vandenhoeck & Ruprecht, 2009.
Lakoff, George. "Mapping the Brain's Metaphor Circuitry: Metaphorical Thought in Everyday Reason." Frontiers in Human Neuroscience 8, no. December (2014): 1–14. https://doi.org/10.3389/fnhum.2014.00958.
Lakoff, George, and Mark Johnson. Metaphors We Live By. Chicago: University of Chicago Press, 1980.
Mácha, Jakub. "Metaphor in Analytic Philosophy and Cognitive Science." Revista Portuguesa de Filosofia 75, no. 4 (2019): 2247–86.
Millikan, Ruth Garret. "Biosemanthics and Words That Don't Represent." Theoria 84, no. 3 (2018): 229–41. https://doi.org/10.1111/theo.12146.
Schlimm, Dirk. "Two Ways of Analogy: Extending the Study of Analogies to Mathemathical Domains." Philosophy of Science 75, no. 2 (2008): 178–200.
Schlimm, Dirk. "A New Look at Analogical Reasoning." Metascience 21 (2012): 197–201. https://doi.org/10.1007/s11016- 011-9563-z.
Tan, Peter. "Interdisciplinary Model Transfer and Realism about Physical Analogy." Synthese 201, no. 65 (2023): 1–27.

The Politics of Knowledge: Art, Science, and Technology Studies

Hannah Star Rogers

Science and Technology Studies, University of Copenhagen

Hannah Star Rogers holds a PhD from Cornell University in Science and Technology Studies and an MFA from Columbia University. She is the lead editor of the Routledge Handbook of Art, Science, and Technology Studies and her monograph from MIT Press, Art, Science, and the Politics of Knowledge appeared in 2022. She is currently based at the University of Copenhagen where she is researching Metabolic Arts as part of a Novo Nordisk grant through the Center for Basic Metabolic Research (CBMR). Rogers works as a curator for art and science exhibitions. Her exhibition “Making Science Visible: The Photography of Berenice Abbott,” received an exhibits prize from the British Society for the History of Science and resulted in an invited lecture at the Smithsonian Archives of American Art. hannahstarrogers.com

Art and science work is experiencing a dramatic rise coincident with burgeoning Science and Technology Studies (STS) interest in this area. Science has played the role of muse for the arts, inspiring imaginative reconfigurations of scientific themes and exploring their cultural resonance. Conversely, the arts are often deployed in the service of science communication, illustration, and popularization. STS scholars have sought to resist the instrumentalization of the arts by the sciences, emphasizing studies of theories and practices across disciplines and the distinctive and complementary contributions of each. The manifestation of this commonality of creative and epistemic practices is the emergence of Art, Science, and Technology Studies (ASTS) as the interdisciplinary exploration of art–science.

This article proposes organizing principles for thinking about art–science across the sciences, social sciences, humanities, and arts drawn from ASTS. Encounters with art and science become meaningful in relation to practices and materials manifest as perceptual habits, background knowledge, and cultural norms. I will show how the tools of science and technology studies (STS) can be applied to artistic practice, offering new ways of thinking about people and objects that have largely fallen outside the scope of STS research. Arguing that the categories of art and science are labels with specific powers to order social worlds—and that art and science are best understood as networks that produce knowledge—this paper will demonstrate through a selection of cases the similarities and overlapping practices of these knowledge communities.

Index

SLSAEU23.FAU.DE

SLSA eu

ELINAS

FAU
Friedrich-Alexander-Universität
Erlangen-Nürnberg

Dr. Alfred-Vinzl-Stiftung