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Review 2024 and Structure of the KLI

KLI najviše me dojmio vrijednošću koja isčezava:
ovdje imaju vremena za ideje i poteškoće koje susrećete
tijekom Vašeg istraživanja.
Nema standardnih akademskih izgovora, nema muljanja,
nego se pod okriljem Vile sluša i razgovara na potrebiti način.

"The KLI impressed me most with its emphasis on values that are becoming increasingly rare: here, there is time for ideas and for the difficulties one encounters during research. There are no standard academic excuses, no manipulation—rather, under the auspices of the institute, there is attentive listening and dialogue conducted in a manner that genuinely meets the needs of the researchers."

Predrag Sustar
Sveuciliste u Rijeci

1.1 The Year in Review

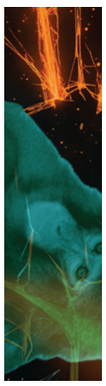
Last year has been a year of change at the KLI. In January, I had the honor of following Gerd Müller as President of the KLI after his retirement. Scientific director Guido Caniglia received an ERC grant and moved to the University of Helsinki. In place of the Scientific Director position, I created three long-term group leader positions, one for evolutionary biology and evolutionary medicine, one for evolution of cognition, and one for philosophy of biology. We were able to recruit Barbara Fischer for leading the evolutionary biology group, while Isabella Sarto-Jackson took over the cognition group. Just now, as of May 2025, Christina Villegas started as head of the philosophy of science group. With this structure, the KLI shall expand and continue to be a place for independent, creative, and critical science and scholarship. The KLI's research focus continues to be in theoretical and evolutionary biology, cognitive science, and the philosophy of biology, including evolutionary medicine.

In 2024, the KLI hosted 30 fellows, who were contributing to 54 publications, organized two workshops, and hosted a summer school as well as several further events. The Institute's journal, Biological Theory, finally received an impact factor, placing it under the top 20% among the journals in this field.

I am very grateful to the 2024 KLI leadership team, Guido Caniglia, Barbara Fischer, Isabella Sarto-Jackson, and Maria Yurdakul, for running the KLI so smoothly and professionally. I am also much obliged to the members of the KLI Foundation, the Board of Directors, and the Scientific Advisory Board for their contributions to the continued success of the Institute.

Finally, I want to express my deep gratitude to Gerd Müller for his immense personal and intellectual commitment to leading and developing the KLI during the last 26 years, which has made it the professional and successful institute it is today. As Honorary President, Gerd continues to be a member of the KLI team.

Philipp Mitteroecker
President



1.2 The KLI

The KLI is an international center for theoretical studies in the life sciences. The institute commits itself to the formulation, analysis, and integration of biological theories as well as the investigation of their scientific and cultural consequences. The thematic focus is on evolutionary biology, developmental biology, and cognition. The KLI supports interdisciplinary research projects in these areas that aim at generating models of living systems or meta-theoretical constructions of historical, philosophical, or cultural aspects of biological theories. Research at the KLI is supported by fellowships in different categories; granting decisions are based on international peer review.

The KLI also pursues its objectives by organizing international workshops, summer schools, and colloquia, and by publishing a scientific journal and a book series.

1.3 Organization of the KLI

Board of Directors

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DR. CHRISTIAN GASSAUER-FLEISSNER
Gassauer-Fleissner Rechtsanwälte GmbH
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Management

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Scientific Director
DR. BARBARA FISCHER
Group Leader "Evolutionary Biology"
DR. ISABELLA SARTO-JACKSON
Executive Manager & Group Leader "Evolution of Cognition"
DR. CRISTINA VILLEGAS
Group Leader "Philosophy of Science"
MAG. MARIA YURDAKUL
Coordinator

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Department of Biology, Arizona State University, Tempe, AZ
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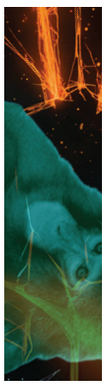
Exeter Centre for the Study of the Life Sciences (Egenis), University of Exeter & Technical University of Munich (TUM)
PROF. DR. EÖRS SZATHMÁRY
Parmenides Foundation, Pullach & Eötvös Loránd University, Budapest



6 External Faculty

PROF. DR. EHAB ABOUHEIF
McGill University, Montreal

PROF. DR. MARTA BERTOLASO
University Campus Bio-Medico of Rome

PROF. DR. MARKUS BASTIR
Museo Nacional de Ciencias Naturales, Madrid

PROF. DR. ROBERTO CAZZOLLA GATTI
University of Bologna

PROF. DR. CHRISTOPH FLAMM
University of Vienna

PROF. DR. WALTER FONTANA
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PROF. DR. BENEDIKT HALLGRIMSSON
University of Calgary

PROF. DR. SIMON HUTTEGGER
University of California, Irvine

EMER. PROF. DR. STUART KAUFFMAN
Institute for Systems Biology, Seattle, WA

PROF. DR. KEVIN LALA
University of St. Andrews

EMER. PROF. DR. STUART NEWMAN
New York Medical College, Valhalla, NY

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Wesleyan University, Middletown, CT
EMER. PROF. DR. GÜNTER WAGNER
Yale University, New Haven, CT
PROF. DR. STEFANIE WIDDER
Medical University of Vienna

Scientific Projects

The KLI offers different types of fellowships for students, post-docs, and visiting scholars in the area of theoretical biology for a period of a few weeks up to two years. All project applications are subjected to an international review process.

2.1 Applications

In 2024, the KLI received a total of 61 applications for fellowships in residence, 22 of these were granted for 2024 or 2025. In addition, 9 visiting fellowships were granted for visiting scholars who stayed at the KLI in 2024.

	applied	granted
Writing-Up Fellowships	27	13
Postdoctoral Fellowships & Senior Fellowships	34	9

2.2 Writing-Up Fellowships

Onerva KIIANLINNA
(October 2024 – March 2025)

Onerva Kiianlinna a late-stage doctoral student at the Doctoral Programme in Philosophy, Arts and Society, University of Helsinki. Her PhD research project "Aesthetic Judging in Contemporary Evolutionary Aesthetics" has been funded by The Finnish Academy of Science and Letters (a three-year grant in 2020–2022) and Alfred Kordelin Foundation (a one-year grant in 2023). Onerva's research interests lie in evolutionary aesthetics, and more generally, in the relationship between philosophical and empirical aesthetics. Recently, her research has expanded towards aesthetics of technology and everyday urban experience. Onerva is the vice president of The Finnnish Society for Aesthetics, secretary of The Nordic Society for Aesthetics, and co-author of the newsletter at The European Society for Aesthetics.

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Aesthetic Judging in Contemporary Evolutionary Aesthetics

In my dissertation, I examine the human capability to form aesthetic judgments, such as "x is beautiful". I do it from the viewpoint of contemporary evolutionary aesthetics and propose a way to grasp the concept of aesthetic judging tailored for this field.

Aesthetic judgment is one of the core concepts in philosophical aesthetics. It is common for evolutionary aestheticians to employ it without positioning their research in relation to the philosophical accounts. The focus has been on different instances of perceiving aesthetic value, but the question of how aesthetic value is – and can be – perceived has remained under the radar. This is problematic since taking something as an instance of aesthetic judgment depends on the way aesthetic judging is conceptualized. Shedding light on what is meant with aesthetic judging clarifies what evolutionary aesthetics explains as well as gives tools to evaluate its research outcomes and formulate future research questions.

The objective of this dissertation is to provide perspectives on how the act of aesthetic judging could and should be understood in contemporary evolutionary aesthetics. Rather than providing a general definition as an answer to the question of what aesthetic judging is, I focus on how aesthetic judging functions in relation to the general functioning of the aesthetic agent (person forming aesthetic judgments). Doing so, I position myself within the proximate evolutionary level asking causal "how questions" about perceiving aesthetic value.

My results presented in five independent articles support the following claims:

The field of evolutionary aesthetics is moving towards proximate level explanations (article I).

From the third-person perspective, aesthetic judging functions as an interface – an indirect information provider – between aesthetic experience and an observer (article II).

From the first-person perspective and looking at the behavior of aesthetic judging, aesthetic judging should be seen as metacognitive activity (at least second-order inference) rather than a non-interpretational reflex (article III).

Looking at the cognitive mechanisms at play, aesthetic judging does not necessarily rely on innate traits even if it was considered universally human (article IV).

An explanation of (a) how an aesthetic agent making aesthetic judgments actually functions and (b) how an aesthetic agent can potentially function that way constitute different levels of abstraction rather than competing same-level explanations (article V).

The results suggest that aesthetic judging should be seen as a plastically (or domain-generally) realized functional module or collection of modules. Modularity of aesthetic judging allows seeing aesthetic judging as an activity but keeping the concept open enough to accommodate different cultural ways in which it can be realized as well as different contexts within which an individual can employ it.

This dissertation is, to my knowledge, the first attempt to clarify the concept aesthetic judging in contemporary evolutionary aesthetics. Used here as a functional rather than an empirical concept, it calls for philosophical analysis tailored for evolutionary aesthetics specifically, where scholars operate back and forth philosophical and empirical explanations. I defend the usefulness of terminology of philosophical aesthetics for the field of evolutionary aesthetics, provide an up-to-date functionalist account of the concept aesthetic judging, and call for further exchange between traditional philosophical and more empirically informed aesthetics.

Franziska REINHARD
(April 2024 – September 2024)

Franziska Reinhard is a PhD researcher in the philosophy at the University of Vienna. Her PhD project studies practices from origins-of-life research from a philosophy of science perspective, combining aspects of general philosophy science, philosophy of biology, and philosophy of the historical sciences. Before starting her PhD, Franziska completed a BA in Chemistry and

Philosophy at the Ruhr-University Bochum and an MA in Logic and Philosophy of Science at the Munich Center for Mathematical Philosophy.

Knowledge-Making in Origins-of-Life Research

How, where, and why life first emerged are still open scientific questions. And origins-of-life researchers who try to answer them are in a particularly challenging epistemic situation. Evidence for processes at the origins-of-life taking place more than 3.5 billion years ago is extremely scarce. And yet, origins-of-life research is an active field. This project focuses on the epistemic value of experimental strategies commonly used in prebiotic chemistry – a subfield of origins-of-life research. Prebiotic chemists seek to understand how biomolecules formed from simpler components on the early Earth; how they self-assembled and ultimately gave rise to biological functions such as replication or metabolism. Researchers in prebiotic chemistry approach the origins-of-life as a chemical problem, which motivates their experimental strategy: they focus is on synthesizing – rather than analyzing – relevant biomolecules in the laboratory under conditions that are consistent with our knowledge of the early Earth environment. My project characterizes synthesis as a key experimental strategy for studying difficult-to-access target phenomena and gives an account of its epistemic value. I highlight that whether synthesis as an experimental strategy succeeds in being informative about long-past chemical process on the early Earth depends on the proliferation – the targeted accumulation – of different synthetic experimental solutions to the same problem, and their subsequent integration.

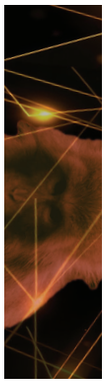
Wiktor ROROT
(October 2024 – March 2025)

Coming from a background in both cognitive science and philosophy, I'm primarily motivated by the (somewhat radical) perspective that cognition is a biological function that we can track across the phylogenetic history of the

animals we ordinarily ascribe it to – building on the ecological and dynamic approaches to mind in philosophy and the emerging research field of basal cognition. My central research interests lie in understanding how cognition is studied across a variety of scientific disciplines, how theoretical concepts shape empirical studies, and what can we do to improve upon our current research practices. This includes also actively encouraging young empirical researchers within neuroscience to reflect upon the theoretical background and implications of their work – which is the goal of the School of Ideas in Neuroscience, a summer school I've been co-organizing annually since 2022 (https://nenckiopenlab.org/school-of-ideas/).
Practically speaking, in my work I employ the tools of digital philosophy of science to get a better sense of how researchers use central explanatory and descriptive concepts, and what these concepts actually mean in the scientific practice. In my doctoral thesis I focus on the term "communication" which is routinely used to describe a plethora of biological processes, from signaling pathways within individual cells, all the way up to human linguistic exchanges.
I am a PhD student at the Interdisciplinary Doctoral School, University of Warsaw, where I'm supervised by Prof. Joanna Rączaszek-Leonardi (Faculty of Psychology, University of Warsaw) and Prof. Marcin Miłkowski (Institute of Philosophy and Sociology of the Polish Academy of Sciences). I have previously graduated with a Master's degree in Cognitive Science and a Bachelor's degree in Philosophy from the University of Warsaw.

Life Scale-Free Communication? An Investigation of the Use of the Concept "Communication" in Biology and Cognitive Sciences

A growing body of research within life science: molecular, developmental, and evolutionary biology, animal behavior, and cognitive sciences (represented by psychology, neuroscience, neurobiology, and cognitive science), employs the term



"communication" in the descriptive and explanatory practices. Processes that are subsumed under this notion include—but are not limited to—interactions between single cells, cell ensembles, organisms of varying complexity, both unicellular and multicellular, and at times between animals and artifacts (such as computers). However, this complex role of the term "communication" in the scientific practice of biologists has hitherto received limited attention.

The current project seeks to answer the question whether the parallels that researchers draw between the linguistic and symbolic communication, and the signaling-based communication that happens in much simpler biological systems are justified, based on an empirical study of a large corpus of scientific papers from life and cognitive sciences. Overall, the project seeks to develop an empirically relevant understanding of "communication" in life science, one that allows for systematic and informative use of this term in the study of a broad variety of biological phenomena, and that can guide further research both in philosophy of science, as well as in life science itself.

Daniel STADTMAUER
(September 2023 – February 2024)

Daniel Stadtmauer joined the laboratory of Günter Wagner in 2016 for a senior thesis (Yale College '17) and continued into PhD research. He is interested in studying the genetic and developmental changes behind evolutionary innovations. His current research in the lab is focused on the evolution of pregnancy in mammals, at the intersection of evolutionary biology, reproductive biology, and immunobiology. His approach to understanding the complex interactions between fetal and maternal cells is by reconstructing how they were modified over the course of evolution. Questions he aims to address are how uterine gene expression has been uniquely modified to support extended gestation

in placental mammals, and in which ways genes that originally evolved as parts of other pathways, such as the immune system, stress, and inflammation, have been incorporated into normal physiology. He is working to apply technology such as single-cell RNA sequencing to study gene expression in the pregnant uterus and to characterize the diversity of cell types within the decidua of placental mammals, the maternal tissue that supports the fetus during extended gestation. He has been awared a KLI writing-up fellowship to complete his PhD thesis.

The Developmental Evolutionary Basis of Tissue Type

At the KLI, I intend to develop a theory for the developmental-evolutionary concept of "tissue type" which will serve as the core conceptual thread linking the chapters of my final dissertation manuscript, and write this as a framework paper. Main driving questions include how quasi-autonomous tissue identity originates and is maintained in evolution, how cell-cell interactions give rise to the emergent properties of tissues, how tissue microenvironment and cellular niche construction drive tissue identity and homeostasis, and how tissue type innovation occurs vis-à-vis cell type innovation.

2.3 Postdoctoral Fellowships

Olesya BONDARENKO
(April 2024 – March 2026)

Olesya Bondarenko is a philosopher of science, specialising in philosophy of biology and philosophy of the social sciences. She received her PhD in History and Philosophy of Science from the University of Cambridge in 2024. Her philosophical interests relate to integrative biosocial research, causal evidence and explanation, and the role of ethical and political values in science. She is particularly interested in behavioural genetics and genomics and their recent integration with the social sciences (sociogenomics). Olesya has developed and taught courses in philosophy of science at the University of Vienna and Kyiv School of Economics.

Behavioral Genetics and Cultural Evolutionary Theory: An Integrative Relationship?

This project examines the relationship between behavioral genetics and cultural evolutionary theory (CET). In particular, it focuses on the recent attempts to integrate the two fields, such as the "cultural evolution of heritability" integrative proposal by Uchiyama et al. (2022). This proposal argues that perspectives on sociocultural change – especially the diffusion of cultural practices – from CET can be fruitfully applied to explain fluctuating heritability estimates of behavioral and psychological phenotypes. I aim to provide a critical examination of this proposal, pointing out its limitations, such as 1) the tension between its mechanistic aims and the use of mechanistically opaque heritability coefficients; 2) its reliance on cases that contrast with the high polygenicity and causal complexity of behavioral traits; and 3) the secondary explanatory import of cultural diffusion compared to the role of specific cultural practices themselves and their ability to interact with genetic effects on behavioural characteristics. I argue that, while an integration along the lines of "cultural evolution of heritability" may be theoretically attractive, an empirical research

programme informed by the proposal is unlikely to be very fruitful, at least in the short term. Nevertheless, it raises more fundamental questions about the possibility of integration between behavioral genetics and the social sciences, the limitations of behavioural genetic methodology, and the aims of explanation itself.

Corey BUNCE
(September 2022 – August 2024)

Corey Bunce is a biologist with a broad range of interests across development, evolution, systems biology, and philosophy of biology. He obtained a Master's degree in Cell and Developmental Biology from the University of Connecticut where he specialized in symbiosis and studied developmental regulation in hydrothermal vent tubeworms. He completed his PhD in Cell Biology at Duke University where his research investigated the spatiotemporal dynamics of mouse gonad development and sex determination. At the KLI, Corey will explore the discursive side of science, hoping to bridge biological research practices and literary theory.

Challenges in Narrative Structuring for Biology Research Reporting

Modern biology is a primarily discursive endeavor. Researchers acquire and contribute the majority of their knowledge of biology through communication with other researchers in the form of scientific research, review articles, and presentations. This project investigates the ways our interpretation of life is shaped by science's formal and informal methods and norms of communicating through application of literary thinking to scientific research reporting. The primary focus will be on narrative structuring. Biological research reports must integrate two parallel plots, 1) the events of the scientific investigation and 2) the events of the natural phenomenon. The theoretical branch of this project will use tools of narratology and accounts of science article writing and reading, as well as

discussions with practicing biologists, to elucidate conscious and unconscious roles of narrative and the types of narratives that occur in mediums of research communication. The empirical branch of this project will analyze the way biologists organize narrative in developmental biology. The chronology of developmental processes will be compared to the organization of the presentation in primary research articles and reviews to identify the dominant organizing principles. The role of narrative has been articulated for the presentation of scientific material to the public, but there is little material directed at communication between researchers.

Elis JONES
(May 2024 – April 2025)

Elis Jones is a philosopher and sociologist focused on scientific practice and values in marine contexts. He is interested in using qualitative and conceptual methods to understand how values (in a broad sense) shape scientific activity, including the influence of personal, social and scientific ideals, but also the value attributed to specific entities, particularly living ones. His BA dissertation, a part of his degree in Politics, Philosophy and Economics, offered a non-anthropocentric definition of environmental damage (i.e. a way to define environmental damage which does not require the existence of humans). His MRes in Science and Technology Studies focused on human bioengineering of corals. His PhD, based at Exeter University's Egenis Centre, focused on the value attributed to coral reefs by scientists. This work was empirical and conceptual: he interviewed coral scientists and qualitatively analysed interview data alongside scientific literature. The result was a thesis looking at key issues in coral science related to reef value: how ecological baselines (depictions of 'normal' or 'healthy' reefs) are produced; how intrinsic, instrumental and non-human forms of value interact and are incorporated into scientific activities; and how coral science itself is increasingly evaluated according to the socio-ecological conditions it produces and perpetuates.

After finishing his PhD he undertook at short project embedded in a marine biogeochemistry lab (the Betrand Lab at Dalhousie University in Canada), where he explored the concepts underlying the rapidly developing field of marine biogeochemistry, which involves the study of microbes and how they move chemical elements around in the ocean. His postdoctoral work focuses on the ecological, scientific and economic value of marine ecosystems. His work is interdisciplinary and engaged, borrowing from philosophy, sociology, science and technology studies (STS), economics, ecology, and biogeochemistry. He has worked closely with scientists and engaged with the public, by organising, attending and speaking at events with marine and social scientists, philosophers, arts and humanities scholars, the general public, and school children. More recently, he has co-organised an international workshop, research network, podcast (titled 'Values at Sea'), and an edited journal volume to foster closer dialogues between STS, philosophy, and marine science.

Theorising the Blue Economy: Connecting Economic, Ecological, and Epistemic Value in Coral Reef Research

Coral reefs sit at the intersection of ecological, economic, social, and scientific systems: they therefore provide a perfect system for a rigorous conceptual analysis of the 'blue acceleration' and 'blue economy', terms respectively denoting the rapid expansion of economic and scientific interest in the sea, and the aim to develop more sustainable marine economic systems in the process. Reefs support a vast range of organisms, impact substantially on human wellbeing, are of considerable scientific importance, so are at the forefront of expanding scientific and economic marine interests. Yet economic values often dominate decision making. This postdoctoral project connects the scientific and ecological value of reef systems within the emerging framework of 'blue economics' to provide tools for understanding and articulating the diverse values of living systems beyond solely economic considerations, something particularly important given growing economic and ecological pressures on marine systems (the 'blue acceleration').

This project builds on my PhD work (which focused on the roles of various forms of value in coral reef science), through analysis of previously unused empirical data already gathered from interviews with coral scientists. Throughout these, scientists expressed the value of reef ecosystems in nuanced ways, providing a rich resource for understanding the value of reefs and other marine systems more comprehensively. I am interested particularly in the different ways the value of reefs are intertwined. Reefs are scientifically very valuable, for example providing records of past climates (similar to tree rings), or sites for 'natural experiments'. But reefs are also often characterised as ecologically very valuable, something often related to their complex structure, biodiversity, and roles in larger ecological processes. Using these cases, as well as concepts from the marine sciences (such as ecological functions and ecological metabolism) I hope to contribute to better understanding of how a variety of forms of value are important in sustainable human-ocean interactions.

Marina KNICKEL
(October 2022 – May 2027)

Marina Knickel was a junior researcher at the Department of Agriculture, Food and Environment of the University of Pisa and a guest researcher at Wageningen University and Baltic Studies Centre (Latvia) working in two projects: Horizon 2020 project ROBUST on rural-urban relations and Interreg project Food Pro·tec·ts in the Dutch-German cross-border region Euregio Rhein-Waal. In ROBUST, she has led a task on monitoring and evaluation of joint learning processes in 11 Living Labs. Her research interests include co-learning processes in transdisciplinary research around agri-food and rural-urban issues, science-policy-practice collaboration, and functioning of the Living Lab approach in multi-actor research projects. Currently, she is a researcher in the EU-funded PLUS Change project, hosted by the KLI.

Knowledge Integration in the Theory and Practice of Interdisciplinary and Transdisciplinary Collaboration in the Agri-Food and Social-Ecological Research: From Challenges to Opportunities

The challenges societies are facing today (e.g., climate crisis, biodiversity decline, resources depletion, pandemics) and the solutions to be developed transcend disciplinary boundaries, are multi-sector and multi-actor, connect local and global, and they are intertwined with diverse and dynamic socio-cultural and political contexts. Pursuing sustainability requires fundamental and deliberate changes in knowledge systems. In fact, integrating different kinds of knowledge and different ways of knowing is increasingly seen as a precondition for achieving sustainability.

A key feature of interdisciplinary (ID) and transdisciplinary (TD) research approaches is their aim to bridge different knowledge systems. To use and generate knowledge for solving complex real-world problems, scientists need higher-order cognitive skills when applying theories, models, concepts or data in ID and TD research. However, contributions on how to theoretically and practically integrate different knowledge systems remain scarce and scattered and multiple inconsistencies are identified between the theory and practice of ID and TD sustainability research.

My research aims to go beyond the state-of-the-art by providing both theoretical and empirical contributions on how to enhance the integration of different knowledge systems. In doing that, I will pay particular attention to underexplored epistemological and cognitive mechanisms. This will include exploring the 'lenses' of different actors in the knowledge system and their collaborative capacity as well as examining how joint learning processes and knowledge integration can be fostered across disciplinary, cultural, and sectoral boundaries.

My research will build on a two-step iterative research design whereby theoretical and empirical explorations will be mutually reinforcing. The qualitative and quantitative data available for the analysis comprise three online surveys providing longitudinal data over 4 years and multiple interviews with key actors.

By using different methods in this two-step iterative research design, a more differentiated analysis of knowledge integration

and learning processes accounting for socio-cultural context will be possible. Thanks to the novel and encompassing theoretical framing achieved in the first step, the empirical analysis is expected to contribute to shaping theory and indicating new avenues for research.

Somya MANI
(April 2024 – April 2026)

Somya Mani is a theoretical biologist. In her work to date, she has studied evolutionary transitions in genetic, cellular and multicellular systems. She received her PhD from NCBS in India, where she studied the evolution of the eukaryotic cell through mathematical modeling. She moved to do a postdoc at the Institute for Basic Science in South Korea where she explored many subjects in evolutionary biology: This is where she began to build her research on developmental evolution, and also produced the first modeling framework for the study of de novo gene birth. In general, her work involves building mathematical models to capture evolution of biological systems using tools from physics and mathematics, particularly statistics and graph theory.
Her research at KLI will be focused on developmental evolution: Her approach is to combine insights from single cell transcriptomics data analysis with theoretical modeling in order to understand selective forces that shape developmental programs, and at a local level, shape cellular decisions to migrate, die or differentiate into other cell types.

Investigating the Origins of Directionality in Multicellular Development

Multicellularity arose from unicellular ancestors multiple times independently in the history of life. During the evolution of multicellular lineages, multicellular and unicellular life-cycles

have diverged significantly from each other: Some differences are lineage specific, for example, in contrast with plant and fungal cells, animal cells are motile, and animal development involves massive cellular rearrangement. While other differences between multicellular and unicellular organisms are shared across the different multicellular lineages, and form core features of multicellularity.

This research proposal deals with a core multicellular feature: directional development. Multicellular life-cycles invariably involve developmental stages, where starting from a single celled zygote, cells divide and differentiate into distinct cell-types and give rise to a multicelled adult body. Multicellular development is directional: cell-types that arise early in development (such as embryonic cells) are not seen again in later stages (such as the adult). There are many molecular mechanisms which maintain developmental directionality, for example epigenetic mechanisms, and mechanisms based on cellular signaling. The directionality of multicellular development is in sharp contrast with unicellular cell-type switching programs which are cyclic and contain bidirectional differentiations: This contrast leads us to ask why directional development repeatedly arose in multicellular lineages that evolved independently from unicellular ancestors?

Our understanding of directionality of development comes piecemeal from experimental observations, and we lack a measure of the extent to which multicellular development is directional. We also do not understand how and why multicellular development has evolved to be directional. The main objectives of this research project are: (a) using the recent explosion in single cell RNA sequencing data to empirically quantify the extent to which multicellular developmental programs are directional across different multicellular lineages, and (b) theoretical modeling of developmental evolution in order to understand evolutionary pressures that drove multicellular development to become directional. Overall, this project aims to deliver a new perspective for developmental evolution, and forges a connection between research on cell fate restriction during development with questions around the origins and evolution of multicellularity.

Ludo SCHOENMAKERS
(October 2023 – September 2025)

Ludo Schoenmakers is a philosopher and scientist who works at the interface of biology, chemistry, and philosophy. His interests include synthetic biology, origins of life, evolutionary theory, metaphilosophy, and the history of analytic philosophy. After completing a BA in philosophy and a BSc in medical biology, he obtained a MA in analytic philosophy and a MSc in molecular biology, in each case at Vrije Universiteit Amsterdam, the Netherlands. He completed his PhD in synthetic biology under supervision of Prof. Dr. Wilhelm Huck at the Department of Physical-Organic Chemistry at Radboud University, the Netherlands. His research at the KLI is focused on the applicability of evolutionary theory outside classical, organismal biology, specifically to the origin and early development of life.

The Origins of Evolution

The theory of evolution has a tremendous explanatory power when it comes to understanding the biological world, yet its basic conceptual structure appears to be fairly simple. In this light, attempts to apply evolutionary theory outside the context of classical, organismal biology – to topics such as economics, epistemology, literary theory, and many others – are hardly surprising. Yet these attempts rely on an important assumption, namely that evolutionary theory is sufficiently ontologically and epistemically domain independent to be applied to domains other than biology. That is, it relies on the assumption that even though evolutionary theory is based entirely on biological phenomena (ontology), synthesizing fields such as population genetics, paleontology, geology, ecology, molecular biology, and the like (epistemology), this nevertheless does not restrict its application to other domains.

If we want to understand whether and how evolutionary theory can be applied outside biology, one strategy is to look

at its application to an ontologically and epistemically closely neighboring domain. One such domain is the emergence and early development of life as studied within Origins of Life (OoL) and synthetic biology research. In both of these fields, complex molecular systems ranging from autocatalytic reaction networks to minimal protocells are routinely described in terms of evolution, selection, heredity, and others. This raises the question whether this use of language is merely metaphorical, or if it is indicative of the use of actual evolutionary concepts in explaining and understanding the early, chemical emergence and development of life on Earth. More generally, it raises the question what constitutes the lower limit of evolutionary theory in terms of the scale and complexity of living (or life-like) entities.

Thus, in this project, the following question takes center stage: How can evolutionary theory be applied to the pre-biological emergence and development of life? Answering this questions requires answering three further questions, namely: (i) What constitutes the proverbial hard core of contemporary evolutionary theory? (ii) How should we conceptualize the pre-biological emergence and development of early life? (iii) In what way, if at all, can contemporary evolutionary theory be applied to this development?

Due to its strongly interdisciplinary character, the relevance of this project is threefold. First, it allows us to get clearer on the nature of evolutionary theory at the early stages of life, as there must have been some point during the transition from prebiotic chemistry to cellular life at which evolutionary theory began to apply. Second, it allows us to understand how contemporary scientists working on early life use evolutionary language to describe their work – metaphorically or otherwise. Third, an analysis of the application of evolutionary theory to early life research potentially allows valuable crosspollination, where evolutionary theory is modified by insights from early life research and vice versa.

2.4 Senior Fellowships

Andrea GAMBAROTTO
(February 2024 – August 2024)

Inspired by classical German sources such as Kant and Hegel, my research interests lie mainly in complex systems theory, with a particular focus on the relation between teleology, agency, and cognition in biological systems. I am deeply convinced establishing theoretical connections between classical philosophies of nature and current approaches in biological theory is fruitful to advance our understanding of both. My research endeavor is fundamentally influenced by the framework of biological autonomy, developed in the pioneering work of Francisco Varela and further articulated in current organizational accounts of biological teleology and enactive accounts of cognition. My commitment to this approach led me to promote and fund the creation of Dialectical Systems, a forum in biology, ecology and cognitive science (https://www.dialecticalsystems.eu/), whose mission is to foster interdisciplinary dialogue among scientists, scholars and theorists who share a non-reductionist approach to living systems. My increasing involvement with the autonomy tradition led to the appointment as a Maria Zambrano fellow at the University of the Basque Country, where the framework of autonomy has been developed over the last two decades.

Hegel's Philosophy of Biology

The project aims to turn the research I developed in the course of my Marie Curie fellowship into a research monograph. Based on several published articles in leading peer-review journals, yet reworked into a novel and unified narrative, the book addresses Hegel's philosophical stance on organismal life, which in contemporary terms might be defined as his 'philosophy of biology.' A particular attention is given to the ontological status of organisms in biological theory, the purposive (agential) nature of biological systems, and the relation between life and cognition. While extensive

literature has been devoted to Kant's philosophy of biology, Hegel's work on this topic remains largely unexplored. This is due to a long-lasting preconception against his philosophy of nature, which originated in the nineteenth century and still reigns today. The challenge of the book is to remove this preconception by interpreting Hegel's philosophy of biology in light of the theory of biological autonomy. The term "biological autonomy" was coined by biologist and cognitive scientist Francisco Varela to define the ability of a living systems to produce and maintain themselves. The working hypothesis of the project is that the framework of biological autonomy provides the most effective template for re-reading Hegel, and that Hegel's theory of biological individuality provides a powerful theoretical background to unify various current approaches concerned with the return of the organism and the establishment of an agential perspective in biological theory.

Anne LE MAITRE
(February 2024 – March 2026)

Trained in natural sciences, I completed a Master's in Paleontology at the Universities of Poitiers and Montpellier, as well as a Master's in Education in Biology and Geology at the École Normale Supérieure of Lyon, France. I did my doctoral degree on the adaptation and phylogeny of the inner ear in extant and fossil primates at the Université de Poitiers, where I also taught Geology and Plant Biology for three years. In relation to these activities, I have participated to paleontological excavations in Myanmar, Greece and France. Since 2017, I joined the department of theoretical biology at the University of Vienna, Austria, to work on the evolutionary mechanisms underlying morphological variation from an empirical perspective, always rooted in a theoretical framework. My research at the KLI is focussed on the evolvability of the inner and middle ear from a macroevolutionary point of view, and its role in the adaptive radiation of mammals.
My work is at the crossroads of evolutionary biology, palaeontology and biological anthropology. I am also inter-

ested in the history of these disciplines and the relationships between science and society. In parallel to my research activities, I am active in diverse initiatives to promote equity, justice and democracy in research institutions and in the society. I am a board member of the Société d'Anthropologie de Paris, as well as a member of the editorial committee of its journal, the BMSAP.

Evolvability of the Mammalian Ear: A Macroevolutionary Approach

The vertebrate ear is a remarkable structure. Tightly encapsulated within the densest bone of the skeleton, it comprises the smallest elements of the vertebrate skeleton (auditory ossicles) and gives rise to several different senses: balance, posture control, gaze stabilization, and hearing. Nowhere else in the skeleton are different bones and functional units packed so close together jointly embedded in their anatomical environment, which hampers the independent evolution of the ear components. Furthermore, the inner and middle ears have already achieved their final size around birth in mammals, creating further challenges for evolutionary change.

All this makes it puzzling how mammals, a predominantly nocturnal group reliant on hearing, were able to occupy such a vast diversity of environments in the aquatic, terrestrial, subterranean, and aerial realms that require an amazing variety in hearing abilities, locomotion and posture. How could the different, tightly connected parts of the ear adapt independently to these diverse functional and environmental regimes?

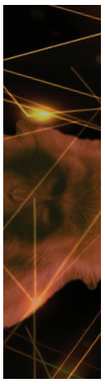
Despite its similar function, the ear is composed of different bones in mammals, birds, and reptiles. In birds and reptiles, the lower jaw and its joint are composed of multiple bones, and they have a single auditory ossicle that transmits the sound. Modern mammals, by contrast, have three ossicles (malleus, incus, stapes), all of which are separate from the jaw. This evolutionary transformation of the primary jaw joint into the mammalian ear ossicles is one of the most iconic transitions in vertebrate evolution, but it is not clear why this complex transition has happened.

Recently, my colleagues and I suggested a new hypothesis: This substantial evolutionary change increased the "evolvability" (capacity for adaptive evolution) of the ear and its associated sensory functions in mammals, in addition to any direct enhancements of mastication or hearing. The incorporation of several jaw bones into the mammalian ear has considerably increased its genetic, regulatory, and developmental complexity which, in turn, has increased the evolutionary degrees of freedom for an independent adaptation of the different functional units of the ear. Despite the tight spatial entanglement of functional ear components, the increased evolvability of the ear in mammals may have contributed to their evolutionary success and adaptive radiation in the vast diversity of ecological and behavioural niches observable today.

For my project at the KLI, I will test this hypothesis by comparing the variational properties, the macroevolutionary adaptation and the evolutionary rates of inner and middle ear shape across birds and mammals by high-resolution 3D imaging and cutting-edge multivariate biometric methods.

Laura MENATTI
(October 2022 – September 2024)

Laura Menatti specialised in environmental philosophy, landscape theory, and philosophy of medicine. Her research aims at developing a theoretical and practical framework for the investigation of the notion of environment and its effects on health. During her research career, she has pursued an interdisciplinary and transdisciplinary trajectory. Her research activities are at the crossroads of philosophy, environmental and cognitive science, they are based on a quantitative and qualitative research methodology and on-field activities. She has been teaching and doing research in different faculties and departments (medicine, architecture, philosophy, science) in Spain, Chile, Italy, and France.



Recently, she has been a visiting fellow at the Center for Philosophy of Science of the University of Pittsburgh. During 2021, she has worked as a postdoctoral fellow at the IAS-Research Centre for Life, Mind & Society of the University of the Basque Country (UPV/EHU), in San Sebastian.
She has been collaborating as lecturer with the Bordeaux School of Architecture and Landscape (ENSAPBx Bordeaux - France), the University of the Basque Country (UPV-EHU) and the Public University of Navarra (UPNA), the University of Chile (Santiago) and the University of Desarrollo (UDD, Chile). She is also book reviews editor of the journal Landscape Research.
She has two PhDs in philosophy, one in aesthetics from the University of Pavia (Italy) and a second one in philosophy of globalisation from the University of the Basque Country (UPV/EHU). In 2015, her second PhD thesis received "The Landscape Research Group Dissertation Prize" for the best PhD essay on landscape (section art and design) by the Landscape Research Group (research group associated with the journal Landscape Research, Q1 Scopus).

Health and Environment. An Integrative Philosophical Framework to Understand Our Relationship with the Surroundings

Health has been mostly discussed in biomedical sciences and humanities in terms of pathology and dysfunction. Disease, pain, and well-being are also mostly defined in these terms. What is absent is a relational framework of health and well-being that accounts for the ways in which the environment both supports and promotes health, rather than being just a source of negative impacts. The COVID-19 pandemic and the projected ways climate change will transform our conception of health and well-being show the need to incorporate the environment in the analysis of health. Practical changes have started to be made. International documents and amendments to the mainstream definitions of health have been calling for the importance of the environment in medical theory and education. A thorough conceptual analysis of the relationship between health and environment that unifies the contributions from different disciplines is thus needed. This project meets the urgency of this need, by extending my previous

philosophical work into an interdisciplinary framework for understanding the coupling between health and environment. The project provides a theoretical analysis in which philosophy is continuously engaged with medical and environmental sciences leading to practical applications. The project has two parts: 1) analysing different conceptualizations of the environment in biomedical sciences in terms of salutogenesis and pathogenesis; 2) applying the concepts of adaptation and adaptivity to further develop these conceptualizations.

These two steps together will provide a relational and situated characterization of the health-environment coupling. I will illustrate how the environment, as related to health, does not constitute only a set of independentboundary conditions affecting a system / human health nor a generic source of perturbations. Rather, I will demonstrate how the environment can be understood as a source of salutogenic opportunities that allow a system to expand its range of viability. This project has applications that go beyond philosophy, as it will help reorient medical education and healthcare practice towards sustainability and environmental thinking.

Enrico PETRACCA
(September 2023 – September 2025)

Enrico Petracca has been a senior fellow at KLI since September 2023. His work at the intersection of economics, "embodied" cognitive science, and the philosophy of mind aims to introduce a novel notion of rationality called "embodied rationality." In the last ten years, he has published more than 20 articles variously related to this subject in peer-reviewed journals and collective volumes, privileging strongly interdisciplinary outlets. Since 2014 he has also held an appointment as a research associate at the University of Bologna (Italy) and did research, either as a post-doc or a lecturer, at the University of Pisa (Italy), Neuchâtel (Switzerland), and the Swiss Institute in Rome. He is a devotee of the (underappreciated) art of writing academic book reviews.

Embodied Rationality: Normative and Evolutionary Foundations

This project introduces a new naturalistic view of rationality called "embodied rationality," which combines the traditional idea of bounded / ecological rationality with embodied cognition in cognitive science. Given the plurality of views within embodied cognition, I introduce four concepts of embodied rationality following an increasing order of embodied radicalism (i.e., increasing degree of rejection of information-processing assumptions): "embodied bounded rationality," "body rationality," "extended rationality," and "radical embodied rationality." The project focuses on the normative and evolutionary foundations of these concepts, showing that the more radical the view of embodied cognition gets, the more the idea of rationality it informs needs to depart from adaptationism (and embrace non-adaptationism). The project also challenges the view that evolutionary theory would be *per se* incompatible with radical embodied cognition. I show that far from being incompatible, non-adaptationism can provide new foundations for radical embodiment.

2.5 Hans Przibram Fellowship

Hari SRIDHAR
(October 2022 – December 2025)

Hari Sridhar is a senior fellow at KLI and oversees the oral history programme of the Archives at NCBS (National Centre for Biological Sciences). Hari is currently involved in two Oral History projects examining the contemporary history of conservation in India, especially in relation to the intersection of ecological knowledge and conservation practice. Over the last eight years, Hari has also led another interview project with authors of classic papers in Ecology and Evolution (https://reflectionsonpaperspast.com/). Hari's other major research interest lies in understanding the causes and consequences of heterospecific sociality, a topic he

researched during his PhD and post-doctoral years at the Indian Institute of Science, Bangalore, and which he continues to stay in touch with through collaborative projects. In addition to doing research, Hari is a visiting lecturer at Azim Premji University and National Centre for Biological Sciences in Bengaluru, and has been an editor of the magazine Current Conservation.

Scientific Practice and Conceptual Change in Evo-Devo: A View from Oral Histories around the Discipline's Foundational Papers

Although only about four decades old, Evolutionary Developmental Biology ("evo-devo" for short) has already made fundamental contributions to a wide variety of areas in biology, and today has all the markings of an established discipline. At the same time, evo-devo's highly interdisciplinary nature and its community of practitioners drawn from diverse disciplinary backgrounds means that the question "What is evo-devo?" doesn't have a singular answer. It contains a variety of research programmes, each with its own style of functioning, paradigms, model systems and culture of scientific practice.

This project is intended as a contribution to the contemporary history of evo-devo, guided by the broad question, "From its beginning, roughly 40 years ago, how did evo-devo get to where it is today, in terms of its concepts, questions, approaches, study systems and empirical and theoretical understanding?" Given the contrasting nature of evo-devo - being a recognized scientific discipline, but consisting of a diversity of independent research agendas – I believe that such a history will be valuable in itself as well as for practicing evo-devo biologists to better understand how the discipline got to where it is today, in terms of its priorities, approaches and understandings gained.

Historical research on evo-devo, till date, has mainly focused on understanding the intellectual antecedents of evo-devo and, to a lesser extent, examining the history of ideas in the discipline based primarily on published scientific papers. To my knowledge, there has been little attention paid to

the history of contemporary scientific practice, along with its ideas, in evo-devo. In this project, I hope to address this gap by conducting a series of oral histories around foundational papers in evo-devo, using an approach I've developed and used extensively in an earlier oral history project in Ecology and Evolution (https://reflectionsonpaperspast.com/).

2.6 Research Assistant

Nora HEIN
(June 2024 – May 2025)

I am a student in the master's programme Organic Agricultural Systems and Agroecology at BOKU University in Vienna where I have previously obtained a master's degree in Environment and Bio-Resources Management. In the course of my training, I have come to appreciate what I believe are vital contributions that inter- and transdisciplinary perspectives can offer to better understand and shape the role of food and farming systems in sustainability transitions.
For my master thesis research, I studied elements of Positive Peace in recurring resource conflicts between agricultural communities in rural Kenya.
My current research collaboration brings together justifications for vegan food choices and structures that support or impede transitioning to veganism in DACH geographical region, with empirical data suggesting substantial demand for the recognition of more-than-human perspectives in analysing non-animal-based food systems.
At KLI, I work as a research assistant in the EU project PLUS Change, which uses a transdisciplinary perspective to investigate land use strategies and decision-making processes to address social, climate and biodiversity objectives.

PLUS Change

PLUS Change is an EU-funded Horizon project that aims to create strategies and decision-making processes for land use, addressing issues related to climate change, biodiversity, and human well-being.

The overarching goal is to generate knowledge and drive transformative change towards a sustainable world. This is done through the production of a range of tools and interventions to shape how land use decisions are made by citizens, planners and policy makers (https://pluschange.eu/about/).

2.7 Visiting Scientists

Martin BRÜNE
(October 2024)

Martin Brüne was born in Dortmund, Germany, in 1962. He graduated in medicine at the University of Münster in 1988. He completed his neurology training in 1993, and his psychiatry training in 1995. His subsequent training included a Visiting Research Scientist fellowship at the Centre for the Mind, a joint venture of the Australian National University and University of Sydney. He is Professor of Psychiatry and Head of the Division of Social Neuropsychiatry and Evolutionary Medicine at the LWL University-Hospital, Ruhr-University Bochum, Germany. Dr. Brüne has authored more than 300 articles and book chapters. He has also authored the "Textbook of Evolutionary Psychiatry and Psychosomatic Medicine: The Origins of Psychopathology" (2nd edn. Oxford University Press, 2016). He served as the Editor (together with Prof. Wulf Schiefenhövel) of "The Oxford Handbook of Evolutionary Medicine" (Oxford University Press, 2019), and (together with Profs. Nico Diederichs, Christopher

Goetz and Katrin Amunts) of "Evolutionary Roots of Human Brain Diseases" (Oxford University Press, 2024). His current clinically oriented research projects include the analysis of social cognition in psychosis and in personality disorders, the association of social cognition with social functioning and nonverbal behaviour, the behavioural performance of psychiatric populations in evolutionary game-theoretical scenarios, the effect of oxytocin on social perception and cognition in psychiatric disorders, nonverbal interaction in therapeutic settings, genetics and epigenetics involved in social interaction, and psychopathology in non-human animals.
Dr. Brüne's research approach is grounded in evolutionary theory, that is, how and why cognition, emotion and behavior in psychiatric conditions relate to adaptive function of psychological traits.
Dr. Brüne is a member of several psychiatric and neuroscientific societies (Deutsche Gesellschaft für Psychiatrie, Psychotherapie und Nervenheilkunde (DGPPN), International Society for Human Ethology (ISHE), Gesellschaft für Anthropologie (GfA), and the International Graduate School of Neuroscience (IGSN), Ruhr-University Bochum.

Life History Theory in the Clinics: Chances and Pitfalls

"Life History Theory" (LHT) is an evolutionary concept derived from Behavioral ecology that aims to explore differences between species with regard to a trade-off between reproduction and somatic growth. Accordingly, species differ not just in body size, number of offspring, and lifespan – in fact, these differences co-vary in quite peculiar ways. Indeed, differences in Life History Strategies (LHS) explain between-species variation concerning age at sexual maturation, growth rate, parental investment, mortality rate, immune function, mutation load, and in efficiency of body repair mechanisms.

In the last decades, evolutionary psychology has adopted LHT to suggest that differences in LHS not only exist between species, but among members of the same species, including humans. One of the landmark articles in this regard posited that in human families, harsh environmental contingencies during early developmental stages, including contextual factors such as family discord, poverty, etc. may predispose parents to adopt an insensitive, rejecting or inconsistent rearing style, which could impact the child's view of the world as insecure, thus promoting mistrustful or opportunistic interpersonal behavior. Together, following these lines would increase the likelihood for a "faster" LHS, compared to more secure environmental conditions. However, the adoption of LHT by evolutionary psychology to explain individual differences between members of the same species has raised methodological concerns among evolutionary biologists.

A crucial question for psychiatry is whether the concept of LHT, or its evolutionary psychological derivate, can be meaningfully applied to psychopathological conditions. I argue that theoretical frameworks, based on evolution by natural and sexual selection, can improve our understanding of the nature of psychopathological conditions, in spite of limitations that are largely associated with disparities between psychological and biological development. LHT, for example, can fruitfully add to insights from attachment theory, which to date is the only evolution-based theory that has prevailed in psychiatry. LHT can also form the basis for empirically testable predictions about comorbidity, and clustering of symptoms, both psychiatric and somatic. If confirmed, LHT may be potentially useful in the domain of preventive medicine, which is highly relevant in light of reduced life expectancy of people with mental disorders.

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Jamila HAIDER
(January – February 2024)

Jamila Haider is a Researcher at Stockholm Resilience Centre, where she co-leads the Resilience and Sustainable Development Research Theme. She studies the relationships between cultural and biological diversity through the lens of food. Research interests are centred in a) the maintenance of cultural and ecological diversity in mountains, b) the meaning and application of resilience as the capacity to change, and c) how researchers can engage more reflexively in the process of science, both to be more aware of deep interdependencies between science, scientists and practice, and to foster more caring ways of doing science. Dr. Haider has worked as a development practitioner in Central Asia and Afghanistan. She is author of 50+ peer reviewed articles, an award-winning book, and is currently working on a non-fiction book together with an Austrian mountain farmer, exploring sufficiency at the heart of sustainability and what it means to become truly alive in the face of uncertainty.

Development as Co-Evolution: How Can Resilience Inform Sustainable Development in Biocultural Landscapes?

Global food security depends on agricultural diversity that has co-evolved with cultural practices over centuries, creating landscapes rich in biological and cultural diversity. The majority of the world's food is produced by family farms in rural areas, which also remain some of the poorest regions of the world. Yet interventions to improve well-being often fail to account for the coevolved relationships between social and ecological dynamics that create and sustain biocultural diversity. A major knowledge gap exists in understanding how development interventions are both shaped by, and can harness these coevolved relationships to improve development outcomes. Resilience offers a promising theoretical framework for understanding development, yet the ways in which it can be

operationalised to inform interventions remains poorly understood. The project studies the resilience of family farms in the Austrian Alps. By combining these insights from theory and practice, the project ultimately helps inform how interventions can better integrate the conservation of biocultural diversity with development opportunities.

The first research objective is to understand what are the processes that create and maintain the social-ecological relationships that contribute to resilience in family farms. The second research objective is to iteratively build on this empirical understanding and better operationalise resilience theory to understand the coevolution and interdependencies of development processes and outcomes in biocultural landscapes, and the capacity of these landscapes to adapt and transform.

Simon HUTTEGGER
(December 2024)

Simon Huttegger is a Chancellor's Professor of Logic and Philosophy of Science at the University of California Irvine (UCI). After having studied at the University of Salzburg, he spent two years as a postdoctoral fellow at the Konrad Lorenz Institute of Evolution and Cognition Research before moving to UCI. He has worked on game theory, decision theory, measurement in biology, the foundations of probability theory and inductive reasoning.

Inductive Logic: Its Philosophy and Contemporary Significance

Rudolf Carnap spent much of the last 25 years of his career developing an inductive logic: a logic of reasoning from the known to the unknown that is derived from first principles and, at the same time, faithful to how scientists evaluate hypotheses and make predictions based on observations. In my talk, I will review what I take to be the main contribution

of Carnap's inductive logic. I will then connect it to developments in Bayesian statistics, in particular probabilistic symmetries and invariance principles and developments in predictive inference, and suggest ways in which it can be enriched to supply a more comprehensive account of scientific inference. I will end with some philosophical reflections on the kind of model of scientific reasoning that inductive logic gives rise to.

Ievgeniia IVANOVA
(May – June 2024)

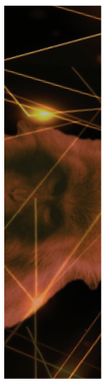
Ievgeniia Ivanova is a Honorary Research Fellow at the University of Aberdeen, UK. From 2012 to 2022 she held positions of senior lecturer and associate professor at the Odesa National Polytechnic University (Ukraine), National Medical University (Ukraine), and National University "Odesa Maritime Academy" (Ukraine). Ievgeniia's research interests cover interdisciplinary areas such as philosophy and methodology of knowledge, epistemology, and philosophy of science using a systems approach to research complex intellectual, value, and social objects. She popularises science and has many popular science publications in different media, and she is a member of the international movement of young scientists and science fans Share Your Knowledge 15x4. Dr. Ivanova is also an author at The Conversation (UK) and Editor-in-chief of an online magazine about culture, urban study, and contemporary art Prostranstvo (Ukraine). Her recent publications include research on Museums as Complex Systems in the Face of the War, Museum and Society, Vol 21, No 2 (2023) and System-descriptive analysis of GPT chat imitation strategies, XI Uyomov readings, Odesa (2023).

System-Parametric Approach to Understanding Values

Today the problem of values finds itself at the centre development of humanity. Obviously, we need clear answers to the question of what a system of values is and what types of such systems are possible. Traditionally no specific method has been created to analyse value systems. Analysis of these complex systems would require methodological tools and, above all a systematic approach. General parametric systems theory and its formal tool, the ternary description language, appear to be a perspective approach to the study of complex value systems and their attributive and relational parameters.

Kevin N. LALA
(May – June 2024)

Kevin Laland is Professor of Behavioural and Evolutionary Biology at the University of St Andrews, and prior to that held positions at UCL, UC Berkeley and Cambridge Universities. He studies animal behaviour and evolution, with a specific focus on niche construction, the extended evolutionary synthesis, and the evolution of cognition. He has published over 200 scientific articles on these topics, and been the recipient of more than £15m in grant income. He is an Elected Fellow of the Royal Society of Edinburgh and a Fellow of the Royal Society of Biology. His books include "Niche Construction: The Neglected Process in Evolution," "Sense and Nonsense: Evolutionary Perspectives on Human Behaviour" and "Social Learning: an Introduction to Mechanisms, Methods and Models."



Evolution Evolving

Evolutionary biology is changing as new ideas flood into it from evolutionary developmental biology, epigenetics, ecology, genomics, the human sciences, and many other disciplines. This is leading to welcome new thinking, and one such novel perspective is the Extended Evolutionary Synthesis, or EES (Pigluicci & Müller, 2010; Laland et al 2014, 2015; Müller, 2017, 2021). Central to this perspective is the idea that knowledge of how organisms develop, grow, and interact with their environments helps researchers to account for both adaptation and the diversity of life. Inspired by developments in evo devo and eco evo devo, in recent years the EES has consolidated into a research program in its own right, lending impetus to a number of topics including developmental bias/constraint, epigenetic inheritance, animal culture, plasticity-led evolution and niche construction. What is required now are accessible synthetic resources that pull these novel findings together and make a coherent case for conceptual change within evolutionary science. While such resources potentially take many forms, books remain of central importance, particularly scientific books that are comprehensible to a wider audience. In addition, workshops play a vital role, by generating discussion of conceptual developments, building teams, and coordinating activities.

Francesca MERLIN
(January 2024)

Francesca Merlin is permanent research fellow in philosophy of science at CNRS and Director of the IHPST lab. She holds a PhD in Philosophy (University of Paris 1 Panthéon Sorbonne, 2009). Her research focuses on central concepts in biology such as chance and probability, inheritance and reproduction, epigenetics both from the developmental and the evolutionary point of view. More recently, she has launched a research project on the

plurality of ways in which the environment is conceived and operationalized in the study of environmentally induced diseases throughout biomedical and social sciences. Since 2018, she is President of the Société de Philosophie des Sciences (SPS). In 2019, she received the CNRS Bronze Medal.

The Pathogenic Niche: An Empowering Concept of Environment for Health Studies

I argue for the need of a new concept of environment for human health studies. After showing the theoretical shortcomings of the fashionable concept of exposome, I borrow from studies in philosophy of biology the idea that the biological environment is a constructed niche. In this view, the environment is always determined (at least partly) by the properties and activities of its reference entity (ontological dependence). Besides, it includes elements that depend on the problem addressed by scientists (epistemological dependence). I claim that, to be more relevant and operational, the environment in health studies should be conceived as a pathogenic niche, epistemologically shaped by the physicians' questions, and ontologically determined by the population that inhabits it. Finally, I ask how our proposal could be translated into tools for scientific practice, and I show its empowering nature for physicians, scientists, but also for politicians and lay people.

Sean PEARS
(September – October 2024)

Sean Pears is a philosopher of biology. His foundations are in philosophy and political science, where his undergraduate research focused on the role of values in science and the place of science in a democratic society. He is currently pursuing a master's degree in Philosophy in Biology and Medicine at the University of Bordeaux, with a focus on the philosophy of biology, particularly evolu-

tionary theory and the expanded evolutionary synthesis. As part of his master's studies, Sean gained formal laboratory experience in the lab of Bertrand Daignan-Fornier, using Saccharomyces cerevisiae as a model organism to investigate the role of multicellularity in cancer metastasis. Sean's current research delves into the integration of evolutionary theory into conservation biology, emphasizing the value-laden nature of restoration ecology and the use of eco-evo-devo as a conceptual framework to develop ecosystems that are resilient and sustainable in the face of climate change.

Eco-Evo-Devo and Restoration: Cultivating Evolvable Socio-Ecosystems

The project explores the complex relationship between human societies and ecosystems, focusing on how these interactions can inform ecological restoration efforts. By conceptualizing these relationships as "socio-ecosystems," the research highlights the interdependence between humans and plants, which has shaped their co-evolution. The project emphasizes that traditional approaches to restoration, which often aim to return ecosystems to their historical states, may not be feasible or desirable in the context of ongoing climate change. Instead, it advocates for the creation of novel ecosystems that are resilient to future changes, using the interdisciplinary framework of eco-evo-devo. This framework shifts the focus from genetic factors to broader environmental influences on development and evolution, offering a more holistic approach to restoration.

The research also delves into the philosophical and practical implications of restoration ecology, emphasizing that it is inherently value-laden. The project's approach integrates the principles of eco-evo-devo to guide restoration practices in a way that addresses the socio-political and environmental challenges posed by global climate change. By redefining our relationship with the natural world and considering the mutual dependencies between human societies and ecosystems, the project aims to develop strategies that are not only effective

in restoring ecosystems but also sustainable in supporting the future of the biosphere. The final aim is to cultivate ecosystems that maximize biodiversity, ecosystem services, and adaptability in the face of rapid environmental changes.

Juno SALAZAR PARREÑAS
(May – June 2024)

Juno Salazar Parreñas is an Associate Professor of Science and Technology Studies and Feminist, Gender, and Sexuality Studies at Cornell University. She is the author of "Decolonizing Extinction: The Work of Care in Orangutan Rehabilitation," which received the 2019 Michelle Rosaldo Prize from the Association for Feminist Anthropology and multiple honorable mentions from the Association for Asian Studies and the American Anthropological Association. She edited the books "Gender: Animals" and "Pandemics: Past and Pending." Her work has appeared in American Ethnologist, Anthropology and History, Cahiers d'Anthropologie Sociale, Catalyst: feminism, theory, technoscience, Environmental Humanities, History and Theory, Tapuya: Latin American Science, Technology and Society, and positions: asia critique.

Dairy Farming Co(w)-Evolution: From the Holocene to the Anthropocene

Lactase persistence (LP), or the ability to digest dairy into adulthood, is an evolved human trait that began appearing alongside animal domestication during the Holocene. In Europe, LP coincides with dairy farming. Neo-Nazi and so-called Alt-Right discourse imagines LP as a biological sign of white supremacy, ignoring research that shows LP has developed in scattered populations around the world, especially in Africa. Meanwhile, in the Anthropocene, dairy farming is

increasingly recognized as a polluting source for carbon and methane emission. Increased environmentalism in Europe has dramatically reduced dairy consumption while dairy farmers are experiencing greater pressure to adopt expensive technologies as the European dairy industry consolidates and leads to farm failures in the name of sustainability (Butler and Holloway 2016; Marescotti et al. 2021; Rest 2021; Zingone et al. 2017). These conditions lead me to this research question: How is deep, coevolutionary history of European dairy farming narrated and remembered while currently being threatened by increasingly climate-valuing European consumers whose consumption of dairy has declined and by increased automation and pressure on dairy farmers to adopt new technologies? This project entails researching contemporary scientific literature on dairying and LP as well as ethnographic and discursive research involving European bovine farmers and climate, vegan, and animal activists.

Jana SEMRAU
(January 2024)

Jana Semrau is research Associate at the Friedrich-Alexander-Universität (FAU) Erlangen-Nürnberg, Department of Sport Science and Sport (DSS), Germany. Jana's research focuses on the sustainable implementation and scaling up of population-based health promotion interventions in local communities with a specific focus on health equity. Her current work is located at the intersection of health promotion science and practice related to the nationwide implementation of the German Prevention Act in local communities. Jana coproduces her work in collaboration with transdisciplinary groups consisting of actors from research, politics, and practice as well as with citizens.

Insights and Implications from Health Research and Sustainability Research on Interconnected Health-Environmental Challenges, Collaborative Approaches, and Structural Development in Science

Jana will be working on the Project "Transdisciplinary Research and Its Scientific Impact" supported by the tdAcademy. The project aims on advancing the study of the interface between sustainability research and health research in participatory and collaborative research, which has been little researched so far. The group seeks to strengthen transdisciplinary approaches through conducting a systematic inventory of existing research at the aforementioned interface in order to gain a better empirically based understanding of the scientific effects of transdisciplinary research in this field. In doing so, the group hopes to gain new insights regarding both the methodological and theoretical advancement of transdisciplinary research.

2.8 Researchers with Own Funding

Joyshree CHANAM
(November 2022 – December 2025)

Joyshree Chanam is trained in the ecology and evolution of plant-insect interactions. She holds a Master´s degree from the University of Delhi and a PhD from the Indian Institute of Science, Bangalore, India. During her PhD, she investigated dynamics of mutualistic interactions between an ant-plant (myrmecophyte) and its ant and insect associates. As a postdoctoral researcher she worked at the National Centre for Biological Sciences Bangalore and investigated the effects of climate warming on floral volatiles and plant-pollinator interactions.

Effects of Climate Change on Food Plants

The project I pursue at the KLI stems from my experience with climate change effects on plants during my post-doc. Plants produce chemical defense compounds in response to biotic (herbivores) and abiotic stresses (heat and drought). In edible plants, these 'defense chemicals' are what we call 'flavors'. I plan to investigate how climate change affects food plants in terms of flavors, growth and yield. During my stay at the KLI, I plan to conduct a literature survey of published work on this topic and write up a summary paper on how plant-based food will be affected by a future warmer climate. With that as the base, I will then work on more nuanced questions within this broad framework, and how to collect data for future work. I also plan to explore the impact of climate warming on possible eco-evolutionary dynamics of food plants, and what that implies for future wild edible plants, and communities that use them.

Martin Andreas SCHMID
(September 2024 – February 2025)

Martin Schmid is an environmental historian trained in history and archaeology. He studies societies' biophysical and symbolic relationships with nature since c. 1500. His research covers rivers, agriculture, cities and wars, and has a spatial focus on Austria and Europe.

What Is Socio-Ecological Industrialization in Co-Evolutionary Terms?

With its theoretical concepts and empirical studies, Social Ecology has established an understanding of industrialization that has become influential in various academic communities. The idea of a socio-metabolic regime transition based on fossil fuels forms the core of this socio-ecological understanding of

industrialization. In my research at the KLI, I want to reconcile this socio-ecological approach with concepts and terms from the evolutionary sciences and reformulate it on a co-evolutionary basis. My starting point is to conceive of social-metabolic industrial regime shifts as a new mode of structural coupling of natural and social systems and thus as a genuinely co-evolutionary process and to analyze it systematically. This project aims to argue for a historically informed, long-term and co-evolutionary perspective in the current debate on socio-ecological transformation. Its originality stems from this novel combination.

My project for KLI has a clear focus on theory development. As an environmental historian, I can also draw on previous debates in my field, e.g., on "evolutionary history". As an environmental historian, it is important to me to bring such theoretical considerations down to earth by reconstructing very specific processes of historical change. Therefore, I see my work at the KLI embedded in two of my current, FWF funded research projects on the industrialization of Austrian forests and rivers from the late 18th century onwards. My work at the KLI aims to update and strengthen the theoretical basis of this ongoing research, including that of the doctoral students I supervise.

During my stay at KLI, I plan to mainly work on two journal articles. A conceptual paper arguing for a co-evolutionary understanding of socio-ecological "industrialization," which shall become the core outcome of my stay at KLI, hopefully to be developed in collaboration and co-authorship with other people at the institute. Secondly, an environmental history paper analyzing how rivers and forests from the late 18th c. onwards changed their role in social metabolism during industrialization in terms of society-nature co-evolution.

Luis Alejandro VILLANUEVA HERNÁNDEZ
(April 2023 – March 2024)

Luis Alejandro Villanueva Hernández completed his BA in Philosophy at the Benemérita University of Puebla BUAP, followed by a MA in ethnomusicology at the National Autonomous University of Mexico (UNAM). From January to June 2016, he did a PhD stay research under the supervision of Professor Ian Cross in the Centre for Music and Science at the Faculty of Music of the University of Cambridge. In his PhD dissertation, supervised by Professor Sergio F. Martínez, he explored models of niche construction, material culture evolution, social interaction, cognitive ethnomusicology, cognitive archaeology, and embodied music cognition, to develop a framework that would allow the integration of different scientific findings going on different disciplines that may be relevant to explain the origins of musical cognitive capacities. He previously was a KLI writing-up fellow and subsequently a KLI postdoctoral fellow.
He is also an active musician and plays a wide range of traditional musical instruments from Mexico and South America. He has been, for many years, a member of a Mexican musical band called Tsasná (moonlight in Totonac language) with which he has recorded several albums and performed in many international music festivals in Mexico, Europe, South America, and Asia.

Social Affordances in the Transmission and Evolution of Music: A Theoretical Evo-Devo Approach

It has been argued that cultural evolution and genetic inheritance are driven by similar rules. However, such accounts of evolution misperceive an important set of disanalogies between the structure of genetic inheritance and the structure of complex processes of cultural transmission. Furthermore, these models usually left unattended the important role that the development of human organisms play in the production and

transmission of cultural traits. Unlike a purely gene-centered approach, EvoDevo research agenda has focused on two key problems about evolution: how do evolutionary mechanisms generate and modify organismal developmental processes, and how does the structure of developmental processes shape back the patterns and processes of evolution. This implies that to understand either evolutionary or developmental processes, we need to understand how they shape one another. Music is a particularly rich cultural expression in which these interrelational processes can be explored.

The process through wich individuals acquire a repertoire of muscial skills is a multifactorial one (taking place during the personal development of individuals within a social group), and this is possible because social environments afford the maintenance of standing musical practices. The study of the reciprocal interrelation between the acquisition of musical skills and the maintenance and evolution of a musical tradition over time has not been explored, yet. I suggest that the notion of social affordances – understood as a set of possibilities for social interaction provided by a sociomaterial environment — would shed valuable light on the way that these interrelational processes function. Thus, the integration of this concept into an EvoDevo account of music would bridge this research gap, which constitutes the main theoretical contribution of this project.

Meetings and Lectures

The KLI supports international workshops, symposia, and individual talks that are organized by the KLI or in cooperation with other institutions.

3.1 Altenberg Workshops in Theoretical Biology

The 'Altenberg Workshops' address key questions of biological theories. Each workshop is organized by leading experts of a certain field who invite a group of international specialists to the KLI. The Altenberg Workshops aim to make conceptual progress and to generate initiatives of a distinctly interdisciplinary nature. Further information concerning the participants and their presentations can be found on the KLI website. Workshops hosted at the new institute building in Klosterneuburg are continued as 'Altenberg Workshops.'

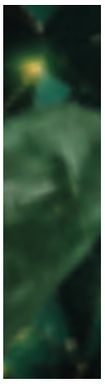
41st Altenberg Workshop in Theoretical Biology 18 – 21 June 2024

Sociocultural EvoDevo: Cultural Neurobiological Inheritance Systems (CNIS)
KLI, Klosterneuburg

Organization: Isabella Sarto-Jackson (KLI) and Daniel O. Larson (California State University, Long Beach)

Topic and Aims

The purpose of the proposed Workshop was to bring together a group of internationally recognized scholars to discuss the prospect of developing a Unified Science of Human Behavior. Representatives from multiple fields including neurobiology, anthropology, evolutionary developmental biology, social psychology and human development were invited to participate in focused discussions on topics that challenge the individual scholar as well as the scientific community collectively. We exploree what possible role each of these fields might play in an interdisciplinary effort to build a comprehensive theory of human behavior grounded in a Sociocultural EvoDevo framework. Specifically, the group explored crosstalk between biological and cultural factors that become manifested in the individual brain development, neural wiring, neurochemical homeostasis, and behavior. We focused on the potential value of collaborative research designed to probe the integrative dynamics of cultural context, neuroplasticity, learning, memory, neurotransmitters and emotions. This evaluation may be key to operationalizing a Unified Theory of proximate and ultimate



causes of human behavioral expressions. Indeed, the group considered exactly how we might bridge disciplines in unique ways to shape conceptual innovations, pose hypothesis testing programs, structure interdisciplinary research designs and employ advanced methods and technologies. In this era of intra-disciplinary specialization, these kinds of integrative issues are seldom explored with any rigor. Therefore, the scholarly evaluations that were undertaken during the Workshop was informative and groundbreaking. Lastly, our objective is not unprecedented. During the 1920s, meetings in Vienna attended by philosophers, scientists and psychologists were held in a bold effort to try and bridge fields for the specific purpose of building a common Unified Theory. We think that with extraordinary advances in our collective fields, in both theory building and empirical research, it is time to rekindle this one-hundred-year-old intellectual pursuit.

Speakers

IGOR BRANCHI
Istituto Superiore di Sanità / Italian Institute of Health, Rome

CLAUDIA BUSS
Charité – Universitätsmedizin Berlin & University of California Irvine

CHRISTINE CALDWELL
University of Stirling

FRANCESCA CIRULLI
Istituto Superiore di Sanità / Italian Institute of Health, Rome

BARBARA FISCHER
KLI, Klosterneuburg & University of Vienna

ANNELIES HOORN
University of Toronto

KEVIN N. LALA
University of St Andrews

EHUD LAMM
Tel Aviv University

DANIEL O. LARSON
California State University, Long Beach

ADAM LINSON
Open University UK

ISABELLE MANSUY
ETH Zürich

ODED RECHAVI
Tel Aviv University

ISABELLA SARTO-JACKSON
KLI, Klosterneuburg

REGINA SULLIVAN
New York University School of Medicine

MICHAEL TOMASELLO
Duke University, Durham

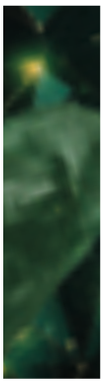
ANTONELLA TRAMACERE
University of Roma Tre

Moderators

MARKUS KUNZE
Medical University of Vienna

SOPHIE VEIGL
University of Vienna

LUIS ALEJANDRO VILLANUEVA HERNANDEZ
University of Würzburg



42nd Altenberg Workshop in Theoretical Biology 8 – 11 October 2024

Aims, Norms, and Values in Scientific Classification for Biodiversity Conservation

KLI, Klosterneuburg

Organization: Joeri Witteveen & Federica Bocchi (University of Copenhagen)

Topic and Aims

The aim of this workshop is to map, discuss and evaluate different perspectives on the role of values in species classification at the interface with conservation policy and practice.

It is widely accepted that the science of conservation biology is entwined with normative postulates and value-laden concepts that stem from its mission- or crisis-oriented character. Likewise, the notion of biodiversity is often viewed as a normative concept that defies a purely scientific definition. Arguably, local aims and values play a pivotal role in deciding which set of biotic entities is considered valuable and merit protection. Doing justice to local norms and values has implications for how we define our conservation units, operationalize key concepts and categories, and shape biodiversity data infrastructures to meet the needs of conservation policy and practice. These challenges in turn raise questions of an applied philosophical nature about epistemic risks and tradeoffs that need to be navigated in bridging theory and practice. This workshop will address these questions at the boundary of theory and practice in a workshop that brings philosophers of science into conversation with ecologists, taxonomists, and other biodiversity scientists.

Speakers

FEDERICA BOCCHI
University of Copenhagen

CARLY COOK
Monash Univeristy, Clayton, Victoria

MAX DRESOW
St. Olaf College, Northfield, MN

DAVID M. FRANK
University of Tennessee, Knoxville, TN

LINDSEY GILLSON
University of York

ARNE MOOERS
Simon Fraser University, Burnaby, British Columbia

EMILY PARKE
University of Auckland

VICTORIA REYES-GARCÍA
Universitat Autònoma de Barcelona

YASHA ROHWER
Oregon Institute of Technology, Klamath Falls, OR

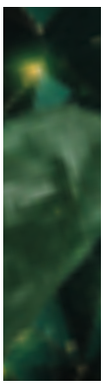
CARLOS SANTANA
University of Pennsylvania, Philadelphia, PA

HARI SRIDHAR
KLI, Klosterneuburg

BECKETT STERNER
University of Arizona, Tempe, AZ

JOERI WITTEVEEN
University of Copenhagen

FRANK E. ZACHOS
University of Vienna & Charles Darwin University, Casuarina, NT



3.2 KLI Summer School

7th European Advanced School in the Philosophy of the Life Sciences (EASPLS)
9 – 13 September 2024

Explanation and Evidence in Biology and Medicine
KLI, Klosterneuburg

Directors: *Leornadro Bich (University of the Basque Country, San Sebastian)*
Lucie Laplance & Matteo Mossio (University of Paris 1 Panthéon-Sorbonne)
Senior Faculty: *John Dupré & Sabina Leonelli (University of Exeter)*
Thomas Pradeu & Maël Lemoine (University of Bordeaux)
Lucie Laplance & Matteo Mossio (University of Paris 1 Panthéon-Sorbonne)
Thomas Reydon (University of Hannover)
Isabella Sarto-Jackson (KLI, Klosterneuburg)
Jon Umerez (University of the Basque Country, San Sebastian)
Marcel Weber (University of Geneva)
Sara Green (University of Copenhagen)

Format

The 7th EASPLS is structured around different forms of participation and aims at fostering interactions among participants and between participants and senior researchers (instructors). The schedule mixes lectures by guest specialists and instructors from associated institutes. Group work addresses questions and issues raised by the lectures. During the week, special sessions are dedicated to career development to help students navigate the difficult academic environment and to help create a healthier one for the future.

Speakers

MARIE KAISER
Bielefeld University

LAURAN NUÑO DE LA ROSA
Complutense University of Madrid

Instructors

LEONARDO BICH
University of the Basque Country, San Sebastian

COREY BUNCE & LAURA MENATTI
KLI, Klosterneuburg

ADRIEN CURRIE
University of Exeter

SARA GREEN
University of Copenhagen

MAEL LEMOINE
University of Bordeaux

MATTEO MOSSIO
University of Paris 1 Panthéon-Sorbonne

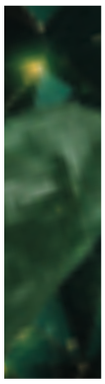
THOMAS REYDON
University of Hannover

MARCEL WEBER
University of Geneva

Topic and Aims

Many scientific activities are focused on the elaboration of explanation and evidence for knowledge claims. Philosophy of biology deals with the distinctive ways explanation is carried out in biological sciences, and has emerged to respond to the inadequacies of the deductive nomological model, when applied to the life sciences. Philosophy of medicine has discussed the role of statistical evidence and mechanistic explanations in our understanding of disease and evaluation of medical interventions.

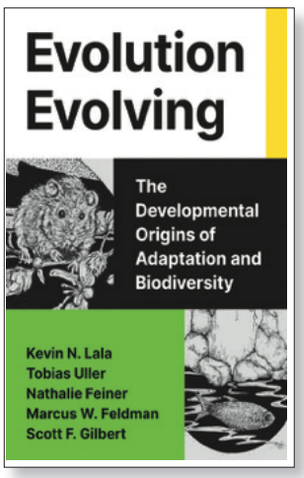
In both biology and medicine, debates about explanation have then been framed around general issues such as reductionism vs. anti-reductionism or hypothesis-driven vs. data-driven approaches, generality vs specificity, the importance of the context of explanation, the epistemic status of models and idealizations, the role of practice, etc. Various and sometimes overlapping explanatory strategies have been identified as deployed by



scientists and philosophers to specifically deal with living phenomena including evolutionary, mechanistic, teleological and functional, structural, topological and organizational. Such strategies are often influenced by evidential practices – i.e., what researchers view as actionable or plausible evidence for their claims, and whether they think such evidence is or could be made available, or not.

The goal of the EASPLS 2024 is to train participants in the philosophical debates on explanation and evidence in the life sciences, the existing strategies, their strengths and weaknesses, as well as their mutual relations. Using examples from past and current sciences, EASPLS 2024 will analyze and reflect on explanation in different fields of the life and medical sciences and its relation to evidential practices. Instructors and invited speakers will address the topic from a wide variety of perspectives, so as to represent the diversity of positions advocated in the literature and to foster debate.

3.3 KLI Special Event



Book Symposium and Book Launch
7 November 2024

Evolution Evolving (Princeton University Press)
KLI, Klosterneuburg

Program

Summary of the book by lead author Kevin Lala (University of St. Andrews, UK)
Commentaries on the book by Gerd Müller (KLI) and Tim Lewens (University of Cambridge)
Panel discussion about the book with authors Kevin Lala, Tobias Uller, Nathalie Feiner, Marc Feldman and Scott Gilbert; chaired by Lynn Chiu.

Topic

The title of this book – Evolution evolving – can be read in two ways. The first captures the idea that the evolutionary process itself evolves over time, and to this day is still evolving. That implies that the way in which each organism evolves depends critically on how that organism works, and on the evolutionary mechanisms those characteristics afford.

Without undermining the central importance of natural selection and other Darwinian foundations, a new understanding emerging within the contemporary evolutionary sciences implies that, say, yeast, oak trees, and human beings may each evolve in different ways; indeed, that all organisms possess a characteristic set of evolutionary mechanisms, contingent on how they develop.

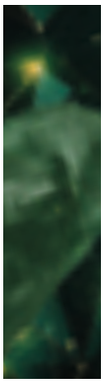
The second reading follows from the first. Evolutionary theory is evolving, not just through the steady accrual of new data and technologies, but perhaps in a more fundamental way, with the emergence of a new way of explaining evolutionary change. That is a second key idea that we explore in this book. New data call for new ways of thinking: ways in which developmental processes are situated more centrally within evolutionary explanation than they conventionally have been.

What the two readings of our title have in common – and the principal thesis that we defend in this book – is that developmental processes do more than impose constraints on selection: they also help explain adaptive evolution..

3.4 KLI Colloquia

KLI Colloquia are informal, public talks that take place at the KLI in Klosterneuburg. Since the pandemic, KLI colloquia are carried out in a hybrid format, with speakers and fellows participating in-person at the KLI, while international guests joining virtually. Abstracts of the presentations and information about the lecturers can be found on the website of the institute.

MARIANNE PENKER
University of Natural Resources and Life Sciences, Vienna
Knowledge Production in Times of Crises: Transdisciplinary Research in Austria



62 FRANCESCA MERLIN
CNRS & Université Paris 1 Panthéon-Sorbonne
The Pathogenic Niche: An Empowering Concept of Environment for Health Studies

JAMILA HAIDER
Stockholm Resilience Centre, Stockholm University
Capacities for Resilience

BRIAN B. MCLOONE
Auburn University, Alabama
How Similar Are Natural Selection and Market Competition?

JANA SEMRAU
Friedrich-Alexander-Universität Erlangen-Nürnberg
Intersecting Health Promotion and Transdisciplinary Sustainability Research: Challenges and Opportunities

LAURA MENATTI
KLI, Klosterneuburg
Salutogenesis: A New Approach to Understand Health-Environment Interactions?

HANS-JÖRG RHEINBERGER
Max Planck Institute for the History of Science, Berlin
About Split and Splice. A Phenomenology of Experimentation

PHILIPP MITTEROECKER
University of Vienna & KLI, Klosterneuburg
Modelling the Evolution of Schizophrenia

HARI SRIDHAR
KLI, Klosterneuburg
An Elephant in the Room? The Place of Science and Scientists in Conservation Decision Making in India

MARINA KNICKEL
KLI, Klosterneuburg
Navigating the 'Epistemological' and the 'Ethical-Political' of Knowledge Co-Production in Inter- & Transdisciplinary Sustainability Research

COREY BUNCE
KLI, Klosterneuburg
Narrative Discourse and the Process of Science

JUNO SALAZAR PARREÑAS
Cornell University, New York
Co(w)-Evolution: Dairying from the Holocene to the Anthropocene in German Speaking Europe

IEVGENIIA IVANOVA
University of Sterling
Parametric General Systems Theory and How to Apply It

MARTIN BRÜNE
Ruhr-University Bochum
Life History Theory in the Clinics: Chances and Pitfalls

MIHAELA PAVLICEV
University of Vienna
Decoupling of Pregnant and Nonpregnant Cycle Enables the Evolution of Mammalian Gestation Length and Body Size

STUART A. NEWMAN
Medical College New York
Agency in the Evolutionary Transition to Multicellularity

SARAH DAVIES
University of Vienna
How to Succeed in Science: Work Hard, Build Relationships – and Be Lucky

BARBARA FISCHER
University of Vienna & KLI, Klosterneuburg
The Evolution of Human Birth

SIMON HUTTEGGER
University of California, Irvine
Inductive Logic: Its Philosophy and Contemporary Significance

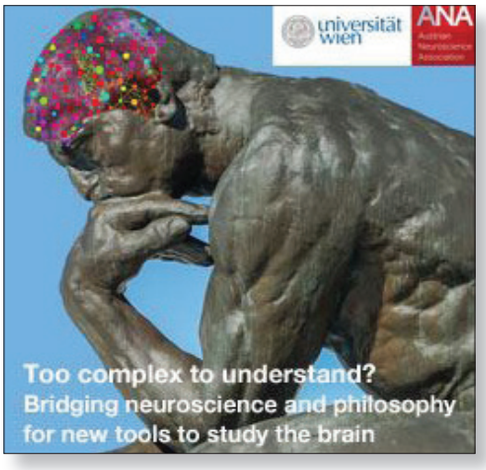
3.5 Cooperative Events

Reading Group
Vienna Science Studies Laboratory
12 February 2024 &
8 April 2024

Organizers: Guido Caniglia & Laura Menatti (KLI), Sophie Veigl (University of Vienna), Stephania Donayre Pimentel (Central European University), Maria Fedorova (Central European University)

The Vienna Science Studies Laboratory is a Vienna-based group of multi-disciplinary researchers interested in the diverse topics and issues of science, technology, and medicine studies. The Lab hosts a reading group currently focused on feminist STS, giving participants the possibility to share ideas on crucial topics of philosophy of science, philosophy of mind and STS. In their first meeting, the group discussed Sara Giordano's "Feminist Science for the People: Feminist Approaches to Public Understanding of Science and Science Il/literacy." In the second meeting the dialogue was centered around "Embodiments of Sex and Gender: The Metaphors of Speaking Surfaces" by Gabrielle Benette Jackson. Recently the group held its third meeting at the KLI, elaborating on Max Liboiron's "Pollution is Colonialism."

In addition to the reading group, the Lab hosts a work in progress lab, which facilitates an environment for friendly critical discussions to improve on-going work. In this format either a student or a faculty member presents some of their work in progress and gets constructive feedback from the other participants of the lab. These are small meetings consisting of 5-10 members of the local community invited to share their thoughts. Additionally, it supports early academics to get a sense of what a professional work in progress looks like.



Satellite Symposium 24 June 2024

Too Complex to Understand? Bridging Neuroscience and Philosophy to Build New Tools to Study the Brain

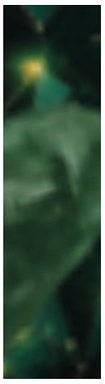
Sky Lounge, University of Vienna

Organizers: Isabella Sarto-Jackson (KLI), Markus Kunze (Medical University of Vienna), Igor Branchi (Center for Behavioral Sciences and Mental Health, Rome), Thomas Bugnyar (University of Vienna)

Topic

The Satellite Symposium took place ahead of the FENS Forum 2024 and ventured into the intersection between neuroscience and philosophy. The aim of this integrative endeavor was to foster interdisciplinary exchange between neuroscientists and philosophers to discuss conceptual approaches, methods and their assumptions, and the interpretive horizon of domains of neuroscience specifically addressing the complexity of the brain. This broadened the knowledge of neuroscientists and raise awareness for characteristic problems when dealing with this complexity.

In this symposium, we aimed at discussing the current knowledge on whole-brain activity (in healthy and disease states) and its foundation in experimental and computational neuroscience. Confronting these models with philosophical concepts of causality and inquiries on the explanatory power of different forms of prediction, allows a better understanding of the strength and potential limitations of today´s concepts of the brain. Moreover, organisms need to integrate their internal state and information by environmental stimuli by means of their nervous system thus neuroscientist exploring brain activity need to consider this complex interaction with due sensitivity. However, a better understanding of the environmental contribution requires a proper consideration how to conceptualize "environment" to operationalize its influence on the brain. Thus, a second discussion confronted neuroscientific approaches to inte-



grate internal states and external stimuli (in health and disease) with reflections on the relevance of different concepts of environment and its relevance for the evolution of brain processes.

Overall, conceptualizing the brain as a complex system, not only calls for cutting-edge empirical investigations and theoretical considerations based on neuroscientific subdisciplines, but also prompts us to exploit insights from philosophy. We, thus, wish to encourage multidisciplinary as well as multi-level research agendas, but also want to emphasize the relevance of direct interaction in interdisciplinary exchange events. Exposing neuroscientists to novel theoretical concepts will help them to address their own research questions from a different perspective.

Program

MARKUS KUNZE
Medical University of Vienna
Philosophy & Neuroscience

GUSTAVO DECO
Pompeu Fabra Univerisity, Barcelona
Whole Brain Dynamics, Modelling, and the Thermodynamics of the Mind

ISABELLA SARTO-JACKSON
Konrad Lorenz Institute for Evolution and Cognition Research, Klosterneuburg
Introductory Remarks

IGOR BRANCHI
Center for Behavioral Sciences and Mental Health, Rome
The Role of Context in Uncovering the Determinants of Brain Functioning, Behavior and Their Interplay

ALEJANDRO FABREGAS-TEJEDA & FÁTIMA SOFIA ÁVILA-CASCAJARES
Katholieke Universiteit Leuven
Conceptualizing Environments in the Study of Cognition

JAN-PIETER KONSMAN
University of Bordeaux
Introductory Remarks

DEMIAN BATTAGLIA
Aix-Marseille University
The Dynamcs of Brain Circuits as an Emergent Dynamics of Information

MAZVIITA CHIRIMUUTA
University of Edinburgh
The Tricky Question of Failure

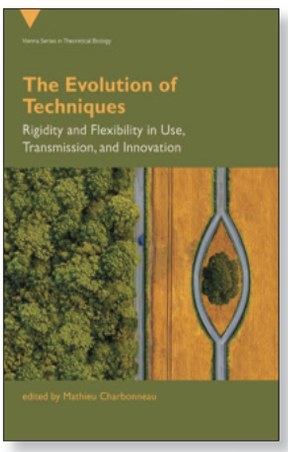
This event dovetails with another interdisciplinary initiative of the organizers: Igor Branchi, Markus Kunze, Isabella Sarto-Jackson, and Ann-Sophie Barwich are guest editors of a Special Issue in the European Journal of Neuroscience (EJN) entitled "The relevance of a philosophical toolkit to advance neuroscience."

Publications

Scientific publications and presentations of KLI fellows and staff in 2024.

4.1 Vienna Series in Theoretical Biology

The 'Vienna Series' is published by The MIT Press as a book series. Books are mainly based on the Altenberg Workshops in Theoretical Biology and the resulting contributions and new syntheses. The book projects are subjected to a reviewing process by The MIT Press.



Volume 35:

MATHIEU CHARBONNEAU
The **Evolution of Techniques**

Volume 36:

W. FORD DOOLITTLE
Darwinizing Gaia

4.2 Professional Papers and Books

BAETU TM.
Extrapolating Animal Consciousness
Studies in History and Philosophy of Science 104: 150–159

BICH L.
Biological Organization
Cambridge University Press: Cambridge

BRENNER A-K.
Path Dependencies and Transformative Actions towards Sustainability: How Actors, Institutions, and Material Dimensions Shape Urban Built Environments
PhD Thesis, University of Natural Resources and Life Sciences (BOKU), Vienna

BRENNER A-K, HAAS, W, KRÜGER T, MATEJ S, HABERL H, SCHUG F, WIEDENHOFER D, BEHNISCH M, JAEGER JAG, PICHLER M.
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Land Use Policy 138: 107037

BRONSTEIN J, SRIDHAR H.
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Philosophical Transactions of the Royal Society B 379: 20230203

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Sense and Nonsense. Evolutionary Perspectives on Human Behavior
Oxoford University Press: Oxford

CANIGLIA G.
Practical Wisdom for Transdisciplinary Sustainability Science
In: Encyclopedia of Interdisciplinarity and Transdisciplinarity (Darbellay F, ed), pp. 399–403
Edward Elgar Publishing: Cheltenham

CANIGLIA G, RUSSO F.
How is Who: Evidence as Clues for Action through Participation in Sustainability Science and Public Health Research
History and Philosophy of the Life Sciences 46: 4

CANIGLIA G, SCHLÜTER M.
Practical Causal Knowledge for Sustainability: Towards an Epistemological Account
In: Routledge Handbook of Causality (Illari P, Russo F, eds), pp. 637–651
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Integrating Evolutionary Theory and Social–Ecological Systems Research to Address the Sustainability Challenges of the Anthropocene
Philosophical Transactions of the Royal Society B 379: 20220262

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Research Environments vis-à-vis Biological Environments: Ontological Parallels, Epistemic Parallax, and Metaphilosophical Parallelization
European Journal for Philosophy of Science 14: 46

FISCHER B.
Evolution of the Human Pelvis and Childbirth
Habilitation Thesis, University of Vienna

GAMBAROTTO A.
Hegel and the Evolutionary Dimension of Autonomy
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Consistency in Floral Volatiles Impacts Plant-Pollinator Interactions in the Face of Environmental Change in the Eastern Himalayas
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GOUDE G, LE MAITRE A, BERTRAND B, MOUNIER A.
Analyses invasives, micro-invasives et non-invasives des vestiges anthropobiologiques: quelles évolutions des pratiques actuelles et recommandations ?
Bulletins et Mémoires de la Société d´Anthropologie de Paris 36: 4–9

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Social Sciences 4: 41

JONES E.
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KIIANLINNA O.
Aesthetic Judging in Contemporary Evolutionary Aesthetics
PhD Thesis, University of Helsinki

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Aesthetic, Noesis, or Both? Enactivism Meets Representationalism in Aesthetics
Phenomenology and the Cognitive Sciences 24: 301–318

KNICKEL M, CANIGLIA G, HEIN N.
Ethics Handbook "Challenges and Opportunities for Just and Equitable Land Use Change in Europe"
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Spatial Model of Cell-Fate Choice Uncovers Strong Links between Tissue Morphology and Tissue Regeneration
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Journal of Anthropological Sciences 102: 7–67

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In: On Epigenetics and Evolution (Guerrero-Bosagna CM, ed), pp. 15–40
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NUÑO DE LA ROSA L, MÜLLER GB.
The Legacy and Evolvability of Pere Alberch's Ideas
Interface Focus 14: 1–12

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Book Review of "A History of Ecological Economic Thought" by Vianna Franco MP & Missemer A, Routledge, Taylor & Francis Group
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A Double-Edged Metaphor: Simon and the Scissors of Bounded Rationality
In: Elgar Companion to Herbert Simon (Gigerenzer G, Mousavi S, Viale R, eds), pp. 131–147
Edward Elgar Publishing: Cheltenham

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Trust and Reliance in the Cognitive Institutions of Cryptocurrency
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No Birth-Associated Maternal Mortality in Japanese macaques *(Macaca fuscata)* despite Giving Birth to Large-Headed Neonates
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PhD Thesis, University of Vienna

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Sustainability Science 19: 949–965

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Book Review of "Care & Cure. An Introduction to Philosophy of Medicine" by Jacob Stegenga, University of Chicago Press
History and Philosophy of the Life Sciences 46: 1–5

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Die sozio-kulturelle Beschleunigung der Evolution
In: Wechselwirkungen und Zufall in der Evolution (Knoflacher M, ed), pp. 155–184
LIT Verlag: Münster

SARTO-JACKSON I, MÜLLER GB, NEWMAN SA.
George McGhee — Visionary Scientist and Pioneer in Evo-Devo
Biological Theory 19: 1–2

SCHMID MA.
Die Soziale Ökologie des Anthropozäns – oder: Was heißt und zu welchem Ende studiert man Umweltgeschichte an der BOKU
BOKU Magazin 03: 30–33

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Life 14: 175

SCHOENMAKERS LLJ, DEN UIJL MJ, POSTMA JL, VAN DEN AKKER TAP, HUCK WTS, DRIESSEN AMJ.
SecYEG-mediated Translocation in a Model Synthetic Cell
OUP Synthetic Biology 9: yase007

SHAKYA B, LIU R, ARYAL K, THOMAS S, SHAOLIANG Y, CHETTRI N.
Ethnic Cuisines from the Eastern Himalaya: Revitalising and Sustaining Mountain Food Systems
International Centre for Integrated Mountain Development (ICIMOD): Kathmandu

SRIDHAR H.
Reflections on Papers Past
https://reflectionsonpaperspast.com

STADTMAUER DJ.
The Evolution of Cell and Tissue Identity at the Maternal-Fetal Interface
PhD Thesis, Yale University Graduate School of Arts & Sciences

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Comparative Single Cell Analysis Reveals Complex Patterns of Cell Type and Cell Signaling Innovations at the Fetal-Maternal Interface
bioRxiv 2024.05.01.591945

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Causing and Composing Evolution: Lessons from Evo-Devo Mechanisms
In: New Mechanism: Explanation, Emergence and Reduction (Cordovil J, Santos G. Vecchi D, eds), pp. 61–83
Springer: Dordrecht

4.3 Forthcoming Publications

CANIGLIA G, MERMANS E.
Trans and Queer Methodologies in Philosophy of Science: An Exploratory and Imaginative Exercise Outside of Cisheternormativity and Its World
In: Methods in Philosophy of Science (Veigl S, Currie A, eds)
MIT Press: Cambridge, MA

FABREGAS-TEJEDA A.
The Organism-Environment Pairing: A Historical and Philosophical Re-Appraisal
MIT Press: Cambridge, MA

FALK D.
Letters from the Round Table ("Tafelrunde"): The Private Correspondence of Hans Asperger before, during, and after World War II
Oxford University Press: Oxford

FOLTS L, MARTINEZ AS, WILLIAMS JA, BUNCE C, CAPEL B, MCKEY J.
OoCount: A Machine-Learning Based Approach to Mouse Ovarian Follicle Counting and Classification
Biology of Reproduction

JONES E, CANADA J, LEONELLI S.
Values at Sea: Science Studies Meets Marine Science
History and Philosophy of the Life Sciences

MENATTI L.
Right to the Environment or Right to the Landscape?
Landezine

SALAZAR PARREÑAS J.
A Petrochemical Archive of Extinction: Anthro-Cast and Nonhuman Relations, a commentary to „Grappling with the Legacies of Anthro-Cast: The Work of Bones in the Age of Mechanical Reproduction" by Chip Coldwell and Danilyn Rutherford
Current Anthropology

SCHMID MA.
The Kreisky Era in Environmental Terms: On the Social Ecology of the Austrian 1970s.
In: Bruno Kreisky: A Reassessment (Burri M, Bischof G, eds)
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STADTMAUER DJ.
Mechanistic and Phylogenetic Perspectives on Pregnancy Sickness
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Authorea

4.4 Journal *Biological Theory*

Volume 19, Issue 1:

SARTO-JACKSON I, MÜLLER GB, NEWMAN SA.
George McGhee – Visionary Scientist and Pioneer in Evo-Devo

MOSS L.
Concepts of Agency: Introduction to the Thematic Section

OKASHA S.
The Concept of Agent in Biology: Motivations and Meanings

VIRENQUE L, MOSSIO M.
What Is Agency? A View from Autonomy Theory

PICKERING A.
What Is Agency? A View from Science Studies and Cybernetics

WATSON R.
Agecy, Goal-Directed Behavior, and Part-Whole Relationships in Biological Systems

MCGHEE GR.
Revisiting Edward D. Cope´s "The Relation of Animal Motion to Animal Evolution" (1878)

SCHNEIDER T.
The Microbiome Function in a Host Organism: A Medical Puzzle or an Essential Ecological Environment?

TRAMACERE A, BICKLE J.
Neuroepigenetics in Philosophical Focus: A Critical Analysis of the Philosophy of Mechanisms

Volume 19, Issue 2:

MOSS L.
Normativity, Autonomy, and Agency: A Critical Review of Three Essays on Agency in Nature, and a Modest Proposal for the Road Ahead

KOHN GM.
Revisiting T. C. Schneirla's "Interrelationships of the 'Innate' and the 'Acquired' in Instinctive Behavior" (1956)

RODRIGUEZ HIGUERA C.
Charles Peirce's Philosophy and the Intersection Between Biosemiotics and the Philosophy of Biology

SMIT H.
The Two Fundamental Problems of Epistemology, Their Resolution, and Relevance for Life Science

PRINZ R.
Biological Codes: A Field Guide for Code Hunters

KUHN GM.
A Discussion on Instinct, Paris, 1954

Volume 19, Issue 3:

DEPEW D.
Richard Lewontin and Theodosius Dobzhansky: Genetics, Race, and the Anxiety of Influence

SARKAR S.
What Is, and What Good Is, Fitness? Reflections on Takacs and Bourrat

TAKACS P, BOURRAT P.
Context Matters: A Response to Autzen and Okasha's Reply to Takacs and Bourrat

BENI MD.
Paths of Purposiveness

NEMATI N.
Rethinking Neuroscientific Methodology: Lived Experience in Behavioral Studies

READ C, SZOKOLSZKY A.
What Animals Can Do: Agency, Mutuality, and Adaptation

TABOADA SOLDATI G, REZENDE PEREIRA A, DA SILVA RH, MORENO J, DE MOURA B, COSTA HC, DA SILVA CHAVES L.
Why Is the Frequency of a Risk More Important than Its Severity in Retaining Adaptive Information? A Multilevel Analysis of Human Evolution Using Snakes as Models

Volume 19, Issue 4:

KELLEY D.
The Conceptual Ecology of "Dysbiosis"

ROSSLENBROICH B, KÜMMELL S, BEMBÉ B.
Agency as an Inherent Property of Living Organisms

TAYLOR LU, PRUM RO.
Developmental Axioms in Life History Evolution

ARIAS DOMINGUEZ A.
Ancient Inner Feelings: Interoceptive Insights into the Evolution of Consciousness

DOMINGOS DE SANTIS M.
Homoplasy as an Evolutionary Process: An Optimistic View on the Recurrence of Similarity in Evolution

EGELAND J.
Mismatch Resistance and the Problem of Evolutionary Novelty

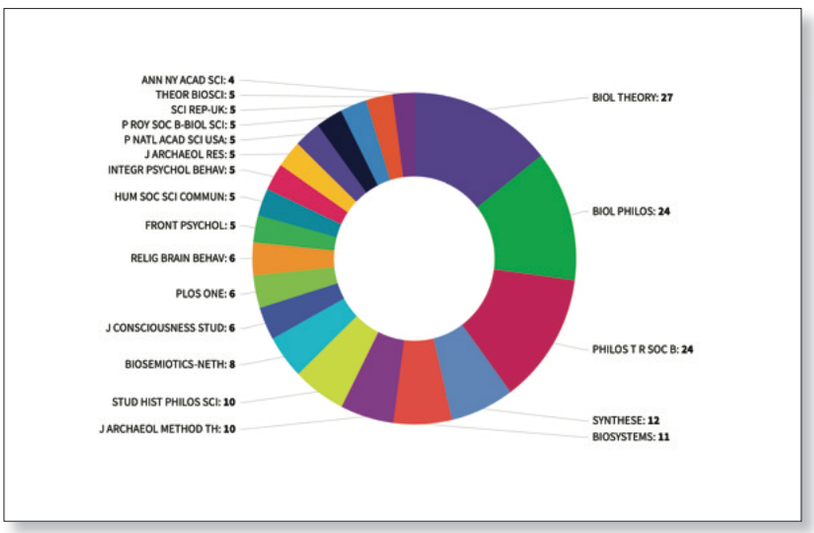
82 Referees for Volume 19

RAMSEY AFFIFI
LEE ALTENBERG
ARTO ANNILA
ARGYRIS ARNELLOS
WALLACE ARTHUR
RICARDO AZEVEDO
GUNNAR BABCOCK
ANN-SOPHIE BARWICH
WILLIAM BECHTEL
MAJID D. BENI
MARIANA BENITEZ
LUBICA BENUSKOVA
RAMRAY BHAT
LEONARDO BICH
PIERRICK BOURRAT
SIMON BROWN
ALLEN BUCHANAN
PACO CALVO
ELLEN CLARKE
DAVID DEPEW
CHRISTOPHER DONOHUE
W. FORD DOOLITTLE
MAX DRESOW
MAURIZIO ESPOSITIO
IGOR FARKAS
MARCUS FELDMAN
RICHARD GAWNE
NATHALIE GONTIER
JEAN-BABPTISTE GRODWOHL
MATTHEW HABER
EDWARD HALPERIN
ERIC HOCHSTEIN
FABIAN HUNDERTMARK
AMITABH JOSHI
ALEX KACELNIK
MICHAEL KEARNEY
FRED KEIJZER
CATHERINE KENDIG
EHUD LAMM
MICHAEL LEVIN
ADAM LINSON
ELISABETH LLOYD
PAMELA LYON
KATE MACCORD
ANTON MARKOS
MARIANO MARTIN-VILLUENDAS
DANIEL MCSHEA
ALESSANDRO MINELLI
SUSANA MONSÓ
LEONARDO MORSUT
GERD B. MÜLLER
CELSO NETO
KARL NIKLAS
LAURA NUÑO DE LA ROSA
CARLOS OCHOA
SAMIR OKASHA
FRANÇOIS PAPALE
MAKMILLER PEDROSO
CHARLES PENCE
LUIZ PESSOA
DAVID PFENNIG
RONALD PLANER
ANYA PLUTYNSKI
GAELLE PONTAROTTI
PAVOL PROKOP
NATSUKO RIVERA-YOSHIDA
CLAUDIO J. RODRIGUEZ HIGUERA
BRIGITTE RÖMMER-NOSSEK
KEPA RUIZ MIRAZO
SAHOTRA SARKAR
ISABELLA SARTO-JACKSON
TAMAR SCHNEIDER
LUDO SCHOENMAKERS
BRIAN SKYRMS
BUBRENA SMITH
VASSILIKI BETTY SMOCOVITIS
ANDREJ SPIRIDONOV
ADRIAN STENCEL
KIM STERELNY
JAVIER SUAREZ
EÖRS SZATHMARY
KOHEI TAMURA
TOBIAS ULLER
SOPHIE JULIANE VEIGL
WALTER VEIT
DENIS WALSH

Impact Factor of *Biological Theory*

In 2024, *Biological Theory* has officially received an Impact Factor of 1.9 in the category "History and Philosophy of Science" by Clarivate Analytics as part of their Journal Citation Reports. The Journal Impact Factor is a journal-level metric calculated from data indexed in the Web of Science Core Collection.
Based on the Impact Factor, *Biological Theory* ranks number 15 out of 104 journals within the category "History and Philosophy of Science" emphasizing the journal´s excellence in the field.

The graphic below shows the top 20 journals citing *Biological Theory* by number of citations.



4.5 Scientific Presentations

BONDARENKO O.
Credibility and Trustworthiness: The Twin Ambitions of Sociogenomic Integration
European Network for Philosophy of the Social Sciences, University of Bergen

BONDARENKO O.
Causal Relationships in Behavioural Genetics: Revisiting the Trait/Trait Difference Distinction
Evelyn Fox Keller memorial conference, IHPST/Université Paris Cité

BONDARENKO O.
Can Philosophy of Science Successfully Engage with Interdisciplinary Research?
Philosophy of Science: Past, Present and Future conference, University of Minnesota

BONDARENKO O.
Values beyond (Mis)uses: Re-centering the Discussion on Values in Behavioural Genetics and Genomics
University of Ulm

BUNCE C.
'Environment' versus 'Setting': The Narrative Concerns of Eco-Devo
Philosophy and Biology Shop Talks, Westfield, NC

BUNCE C.
'Environment' as 'Setting' in Eco-Devo Narrative
World Congress of Environmental History (WCEH) 2024, Oulu, Finland

BUNCE C, MENATTI L.
Navigating Interdisciplinarity for Explanations of Climate Change Adaptation
7th European Advanced Seminars in the Philosophy of the Life Sciences (EASPLS), Klosterneuburg, Austria

BUNCE C, MENATTI L, BRENNER A-K, CHANAM J, KNICKEL M, SRIDHAR H.
Rethinking Climate Change Adaptation by Bringing Philosophy into Dialogue with Social Science and Biology
'Understanding Life in a Changing Planet', Egenis, Exeter

FISCHER B.
The Evolution of Difficult Birth in Humans
Workshop, Academy for Applied Arts, Vienna

FISCHER B.
Die Hüfte aus anthropologischer Sicht
Hüftmeeting, Orthopädisches Spital Speising, Vienna

FISCHER B.
Evolution of the Human Pelvis and Childbirth
Habilitation Colloquium at the University of Vienna

FISCHER B.
Birth and the Evolution of Human Anatomy
Symposium "Human evolution in modern societies," University of Vienna

GAMBAROTTO A.
True Purposes and Naturalism
On Purpose: A Book Symposium on Edgar Maraguat's True Purposes in Hegel's Logic, University of Valencia

GAMBAROTTO A.
Labor Theory of Culture, Enactivism and the Pittsburgh School
Marxism and the Pittsburgh School, University College London

JONES E.
Oceans, Metabolism, and Cancer: Reflections, Connections, and Speculation
Institut de Cancérologie Gustave Roussy Departmental Seminar, Paris

JONES E.
Between the Intrinsic and the Instrumental: Value Relations between Corals, Reefs, and Scientists
International Association for Society and Natural Resources Conference, Cairns

JONES E.
Philosophical Reflections on the Coral Reef Crisis — Ecological Baselines and the Role of History in the Life Sciences
Vienna Natural History Museum Seminar

JONES E.
Conceptualising the Epistemic Value of Ecosystems: The Case of Coral Reefs
Finnish Society for Science and Technology Studies Symposium, Helsinki

JONES E.
Reframing the Concept of Metabolism: Insights from Ocean Biogeochemistry
Centre for the Social Studies of Microbes Seminar Series, Helsinki

JONES E.
Does the Shifting Baseline Problem Apply in the Case of Organism Regeneration?
European Molecular Biology Organisation Workshop: The molecular and cellular basis of regeneration and tissue repair, Saint-Jean-Cap-Ferrat

JONES E.
Relational Values in Science: Lessons from Coral Reefs
Institut d'Histoire et de Philosophie des Sciences et des Technique 'In Relation to Life Conference: Biological Relationality in Contemporary Science, Theory, and Politics', Paris

KIIANLINNA O.
Evolutionary Aesthetics: Curent Issues and Concepts
Comenius University, Bratislava

KIIANLINNA O.
Aesthetic Judging in Contemporary Evolutionary Aesthetics
Moholy-Nagy University of Art and Design, Budapest

KIIANLINNA O.
Aesthetic Judging in Contemporary Evolutionary Aesthetics
University of Helsinki

KIIANLINNA O.
Meet a Researcher
Ressu Highschool by Young Academy Finland, Helsinki

KNICKEL M, CANIGLIA G.
Ethics in TD Knowledge Co-Production: Navigating Justice in Decision-making for more Sustainable Land Use
ITD24 Conference "Inter- and Transdisciplinarity Beyond Buzzwords: Educational Pathways for Sustainable Research Collaborations," Utrecht

LE MAITRE A, GRUNSTRA NDS, BRAVO MORANTE G, PFAFF C, WIMMER W, MITTEROECKER P.
A Comparison of the Intraspecific Variation of Middle and Inner Ear Morphology between Selected Mammals and Birds
NOBIS Meeting 2024: Systematics & Collections, Vienna Natural History Museum

LE MAITRE A, GRUNSTRA NDS, HOLLINETZ F, BRAVO MORANTE G, ZACHOS FE, PFAFF C, WINKLER V, MITTEROECKER P.
Convergent Evolution in the Bony Labyrinth of Afrotheria and Non-Afrotherian Mammals: A 3D Geometric Morphometric Study
12e Symposium national de Morphométrie et Évolution des Formes (SMEF), Dijon

MANI S.
Understanding how the Interplay of Selective Pressures Can Shape the Evolution of Directionality in Multicellular Development
Internal Conflicts and Organismal Adaptation, Groningen

MANI S.
Large Scale Comparison across Single Cell Transcriptomics Data to Understand how Multicellular Development Evolved to Be Directional
EMBO Lecture Course on Evolutionary and Comparative Genomics, Nafplion

MANI S.
How Do Developmental Cell Lineage Maps Evolve?
EvoLunch Seminar, University of Vienna

MANI S, TLUSTY T.
A Simple Mathematical Model to Tease out Links between Tissue Morphology and Healing
Conference "Physics of Cell Fate Decisions," ISTA, Klosterneuburg

MENATTI L.
Rethinking Health through a Salutogenic Perspective: Challenges to Face the Current Health and Climate Crises
11th International Philosophy of Medicine Roundtable, hosted online by Durham University and University of Johannesburg

MENATTI L.
Medicine and the Environment: From the Salutogenic Approach towards the Salutogenic Environments
7th International Conference on Salutogenesis Everyday Life and Crises as Opportunities for Salutogenic Transformation, Medical University of Lodz

MENATTI L.
Hacia una mejor comprensión de la crisis actual de salud y medioambiente a través del concepto de salutogénesis
XI Conference of the Spanish Society of Logic, Methodology and Philosophy of Science, Oviedo

MENATTI L.
Droit à l'environnemet, ou droit au paysage?
University of Lille

MENATTI L.
The Concepts of Health and Environment – A History of Constant Rapprochements and Separations
4th World Congress of Environmental History – WCEH2024, University of Oulu

PALMBLAD J, MENATTI L.
The Environment around Us: Relational Approaches as Common Ground
4th World Congress of Environmental History – WCEH2024, University of Oulu

PETRACCA E.
Adaptive Behavior and Cognition
Catalan Institution for Research and Advanced Studies (ICREA), Barcelona

PETRACCA E.
Where Is the Norm? Cognitive Institutions and the 'Location Problem'
Workshop '4E (Embodied, Embedded, Extended, Enactive) Economics', University of Memphis, TN

PETRACCA E, GALLAGHER S.
Trust and Reliance in the Cognitive Institutions of Cryptocurrency
Workshop 'Sources of Trust – Navigating the fragility of certainty,' University of Heidelberg

PYTTLIK A, BRAVO MORANTE G, PFAFF C, MENENDEZ L, LE MAITRE A, MITTEROECKER P.
Bilateral Asymmetry of the Mammalian and Avian Inner Ear
NOBIS Meeting 2024: Systematics & Collections, Vienna Natural History Museum

ROROT W.
Concepts & Texts in the Practice of Life Science: Understanding the Concept of "Signaling" in Life Science with Topic Modeling
Philosophy of Science: Past, Present, and Future, University of Minnesota, MN

SARTO-JACKSON I.
History of Neuroscience through the Nobel Prizes
Guest Lecture, Medical University of Vienna

SARTO-JACKSON I.
The Arrow of Time: Navigating the Conceptual Interface between Evolution, Development, and Behavior
Summer School "Recentering Neuroscience on Behvaior: A Brain-Body-Environment Integrated Approach," Ettore Majorana International School, Erice

SARTO-JACKSON I.
Biocognition: Knowledge Accumulation in Biological Systems
MeiCogSci Lecture Series, University of Vienna

SARTO-JACKSON I.
Warum ich weiß, was du fühlst
Brain Awareness Week 2024, Medical University of Vienna

SARTO-JACKSON I.
Das soziale Gehirn
Brain Awareness Week 2024, Medical University of Vienna

SARTO-JACKSON I.
Warum ich weiß, was du fühlst
Urania, Vienna

SARTO-JACKSON I.
Gehirnentwicklung und soziale Bindungen
Webinar, Urania, Vienna

SCHOENMAKERS LLJ.
Evolution at the Origins of Life
Conference 'Molecular Origins of Life,' Ludwig-Maximilians University, Munich

SCHOENMAKERS LLJ.
How Darwinian is Minimal Evolutionary Theory?
Workshop 'Darwin and Darwinisms', University of Belgrade

SCHOENMAKERS LLJ.
Minimal Evolutionary Theory and the Origins of Life
Workshop 'Evolution at the Edges of Life', Institut d'études avancées de Paris

SCHOENMAKERS LLJ.
Evolution at the Origins of Life
Conference 'Understanding Life in a Changing Planet: Egenis 20+2 Years of Egenis', University of Exeter

SRIDHAR H.
The Environment in Conservation Biology: Learnings from an Oral History of Indian Conservation Biologists
World Congress on Environmental History, Oulu

SRIDHAR H.
The Place of Science [and Scientists] in Conservation Decision-Making: A View from Indian Conservation Biology
Studies of Open Science course, Technical University, Munich

SRIDHAR H, CHANAM J.
Reflections on Papers Past: Documenting the before and after of Famous Scientific Papers in Ecology & Evolution
Zukunftskolleg, Konstanz

VIOTA M, MENATTI L, PEÑA L, FERNANDEZ DE MANUEL B, AMETZAGA-ARREGI I.
The Role of Green Areas for the Well-Being of University Community: Perceptions and Possibilities for a more Sustainable Campus
Internacional Conference Socioecos, Bilbao

Further Activities

Many activities of the KLI support its mission and vision. Some representative activities are listed here.

5.1 Grants

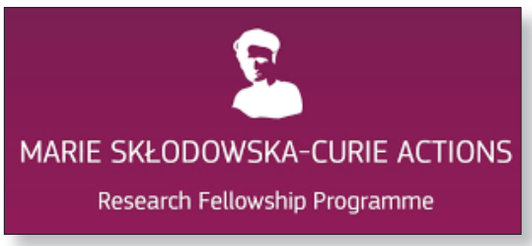
Strengthening European Climate Policy: Governance Recommendations from Innovative Interdisciplinary Collaborations

Corey BUNCE & Laura MENATTI (KLI)

SSH Centre (Social Science & Humanities for Climate, Energy and Transport Research Excellence): Grant 2023 – 2024

The project integrates STEM perspectives with reasoning and knowledge from Social Sciences and Humanities (SSH), which are often excluded from climate adaptative action debates. The KLI team's chapter focusses on the effects of climate change on urban vulnerable populations, and claims that "adaptation should be reframed as situated and relational long-term processes involving people and their ecological, social and historical environments." It also urges that adaptation policies should draw upon the Global South given their long history of adaptation to extreme temperatures. Further, it highlights the significance of mutual learning, social and epistemic justice, and interconnectedness when translating adaptation strategies for the EU.

The project is a remarkable example of 'knowledge integration' and 'interdisciplinary learning'. Through a dynamic and open-ended learning journey, over several dedicated events, which included participatory art-based techniques, the group co-developed an interdisciplinary definition of 'adaptation.' In the process, they appreciated diverse ideas and balanced them against one another and prior assumptions.



Marie Skłodowska-Curie (MSCA) Postdoctoral Fellowship "Toothrow"

to Thomas DAVIES (University of Vienna)

Host & Supervisor: Philipp MITTEROECKER (University of Vienna & KLI)

Dental morphology across the tooth row: Geometric morphometric analysis of multiple tooth positions, reconstruction of missing teeth, and implications for hominin taxonomy (2024 – 2026)

Thomas Davies is a paleoanthropologist who works on hominin dental morphology. He did his PhD at the Max Planck Institute for Evolutionary Anthropology, studying the origin and evolution of the genus Homo from a dental perspective. His research investigates the evolution of hominin teeth, exploring the implications for important transitions in the course of human evolutionary history.

Davies uses micro-CT scanning to investigate the internal structure of teeth; while the enamel surface is worn down over an individual's lifetime, the internal structures often remain well preserved. So, by studying internal dental morphology, we get an insight into the original unworn form of fossil teeth. During his Marie Curie fellowship, Thomas will work with Prof. Philipp Mitteröcker from the Department of Evolutionary Biology to develop a new methodological framework for studying tooth shape across the entire tooth row, rather than focusing on each tooth individually. Fossils are frequently missing teeth, so they will also develop a method of statistically estimating the shape of any missing teeth to reconstruct complete tooth rows.

The project is hosted by the University of Vienna and supervised by KLI president Philipp Mitteroecker.

Projekt der Stadt Wien in Kollaboration mit dem Club of Vienna

to Joyshree CHANAM (KLI)
Supervisors: Isabella SARTO-JACKSON (KLI),
Sigrid KROISMAYER & Hermann KNOFLACHER (Club of Vienna)

Ökologische Empathie (2024 – 2025)

Wie geht unsere Gesellschaft mit bevorstehenden, tiefgreifenden Veränderungen, unvorhergesehenen Risiken und einer unsicheren Zukunft um? Psychologische und kognitionswissenschaftliche Studien legen offen, dass kritische Reflexion und die Bereitschaft zu einem konstruktiven Diskurs durch Vorurteile und kognitive Verzerrungen („Bias“) beeinträchtigt sind, insbesondere wenn es um Themen wie Umweltverschmutzung, Klimawandel und deren Folgen geht (Zaval und Cornwell, 2016). Die kognitiven Barrieren interferieren mit Denkansätzen, mögliche Gegenmaßnahmen zu entwickeln und implementieren, um Auswirkungen des Klimawandels zu reduzieren.

Um die kognitiven Prozesse besser zu verstehen, die sich in einer Gesellschaft angesichts drohender Umweltrisiken und Klimakatastrophe entfalten, ist es wesentlich, kulturelle, emotionale und prosoziale Dimensionen als zentrale Faktoren miteinzubeziehen. Insbesondere ein Verständnis für die Wechselwirkung zwischen „ökologischer Empathie“ und Nachhaltigkeit scheint ausschlaggebend zu sein, um die Mensch-Umwelt-Beziehungen in seiner Vielseitigkeit zu erfassen. Brown et al. (2019) zeigen, dass mangelnde ökologische (und soziale) Empathie, die Motivation verringert, die Umwelt zu schützen und nachhaltig zu leben. Im Gegensatz dazu scheint eine verstärkte Empathiefähigkeit zu einer stärkeren Bindung zwischen Menschen und Natur zu führen, was wiederum die Grundlage für umweltfreundliches Verhalten und Handeln zu bildet (Weik von Mossner, 2017).

Im vorliegenden Projekt wird ein bibliografischer Ansatz verwendet, um das Thema „ökologische Empathie“ anhand von primären und sekundären Literaturquellen und Datenbanken zu untersuchen. Im Wesentlichen geht es um die Fragestellung welche Faktoren die „ökologische Empathie“ maßgeblich beeinflussen.

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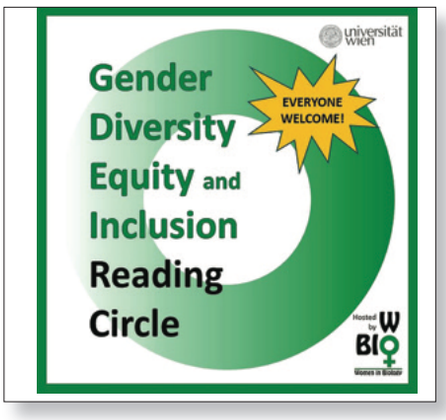
Max Planck-India Mobility Grant

to Hari SRIDHAR (KLI)

The Max Planck-India Mobility Grant (MPIMG) are a distinction awarded to highly qualified Indian scientists who should be in their final year of doctorate or have obtained their doctorate no longer than ten years ago. MPIMG are awarded for three years enabling the candidates to initiate and pursue research links to a Max Planck Institute of their choice. Candidates have the right to visit a Max Planck Institute (MPI) for a minimum of one month per year. In order not to forfeit the MPIMG these visits to the Max Planck Institute must take place regularly every year.

Hari Sridhar will spend a month every year (from 2025 to 2027) in the "Knowledge Systems and Collective Life" department of the Max Planck Institute for the History of Science (MPIWG) in Berlin, working on shared research interests and developing ideas for collaboration between MPIWG and the Archives at the National Centre for Biological Sciences, Bengaluru. In particular, Hari will work closely with MPIWG's newly launched Laboratory for Oral History and Experimental Media, to participate in efforts to develop new approaches to oral histories of knowledge.

5.2 Outreach Activities



Gender Diversity, Equity, and Inclusion Reading Circle

Organizers: Anne LE MAITRE (KLI), Caroline DEIMEL (University of Vienna)

This outreach activity is organized at the University of Vienna by the Women in Biology (WoBio) workgroup: Diversity, Equity, and Inclusion Reading Circle.

The DEI-Reading Circle meets regularly to learn about gender inequity, as well as related and intersecting topics in academic settings and STEM fields. Through readings, discussions, and learning activities, it aims at improving gender equity and counteract sexism in the immediate work and study environments.

The topic for the summer semester 2024 was "Gender bias in academia." The reading group is open to everyone, and it will continue in the summer semester 2025 on the topic "Sexgender diversity in biology," in collaboration with the WoBio workgroup on inclusivity.

Das Konrad Lorenz Institut für Evolutions- und Kognitionsforschung stellt sich vor 5 June 2024

Speakers: Gerd B. MÜLLER & Barbara FISCHER (KLI)

Im Rahmen der Vortragsreihe „Wissenschaft.Klosterneuburg.Schafft Wissen" organisierte die VHS Urania und Stadtgemeinde Klosterneuburg gemeinsam mit dem KLI ein öffentliches Event, das Interessierten einen Einblick in die Forschungsarbeiten gibt, die am KLI durchgeführt werden.

200 Jahre Gregor Mendel Workshop: Dem Rätsel der Vererbung auf der Spur

January 2024 – February 2025

Naturhistorisches Museum Wien & Universität Wien

Organizers: Barbara FISCHER (University of Vienna & KLI), Lynn CHIU & Severin BACHMAYER (University of Vienna)

Anlässlich des 200. Geburtstags von Gregor Mendel laden das Naturhistorische Museum Wien und die Universität Wien zu einem spannenden Schulprogramm rund um das „Rätsel der Vererbung".
Die Formate wurden 2021/22 im Rahmen des EU-Interreg-Projekts konzipiert („G. J. Mendels Vermächtnis für Wissenschaft, Kultur und Menschheit", Projekt ATCZ278 - GJM200). Bis Februar 2025 werden 25 kostenlose Workshops angeboten. Alle Veranstaltungen finden im NHM Wien statt.

Warum sehen Tiere und Pflanzen so aus, wie sie aussehen? Nach einer Kurzführung in der NHM-Schausammlung lernen die Schüler*innen bei einer Quizshow auf Deck 50 die Grundbegriffe und -prinzipien der Vererbungslehre auf unterhaltsame Weise kennen. Im anschließenden Workshop in unseren neuen Labors arbeiten sie in Kleingruppen mit dem Mikroskop und vertiefen im kreativen Spiel „Mendels phantastische Erbsenwesen" ihr Wissen, wie Gene und Umwelteinflüsse gemeinsam das Aussehen von Tieren und Pflanzen bestimmen.

SCIENCE TALK
24 June 2024

Aula der Wissenschaften

Organizer: Bundesministerium für Bildung, Wissenschaft und Forschung

So früh wie möglich?
Frühkindliche Förderung aus wissenschaftlicher Sicht

Diskutantinnen: Isabella SARTO-JACKSON (KLI), Yvonne ANDERS (Universität Bamberg), Fabienne BECKER-STOLL (Staatsinstitut für Frühpädagogik und Medienkompetenz), Natascha TASLIMI (Pädagogische Hochschule Wien)
Moderation: Doris HELMBERGER-FLECKL („Die Furche")

Eine wesentliche Grundannahme für die Podiumsdiskussion ist die wissenschaftliche Erkenntnis, dass die Plastizität des Gehirns, die Lern- und Gedächtnisprozessen zugrunde liegt, in den ersten Lebensjahren eines Kindes besonders umfassend ist. Weiters erfordern die meisten Lernprozesse soziale Interaktionen und zwischenmenschliche Beziehungen. Mangelnde Bindung und mangelnder Beziehungsaufbau zwischen Kinder- und Kindergartenpädagogen – oft aufgrund eines schlechten Betreuungsschlüssels – können bei Kindern erhebliche physiologische und psychologische Stressreaktionen hervorrufen, die sie in weiterer Folge daran hindern, ihr volles Lernpotenzial auszuschöpfen. Die Bildungsforschung plädiert daher für die Schaffung von Kindergärten als echte, erste Bildungseinrichtungen und die damit weit über einfache Betreuungseinrichtungen hinausgehen. Denn mit der Ausbildung qualifizierter Pädagog:innen, mit der Sicherstellung eines guten Betreuungsschlüssels, mit dem Fokus auf zwischenmenschliche Beziehungen sowie mit der Förderung und kognitiven Stimulation der Kinder legen wir den Grundstein für erfolgreiche Lernbiografien im späteren Leben.

Bundesministerium
Bildung, Wissenschaft
und Forschung

Pressekonferenz 24 June 2024

Narrativ Elementarpädagogik: Die bedeutendste Investition in die Zukunft

SprecherInnen: Isabella SARTO-JACKSON (KLI), Gudrun FEUCHT (Industriellenvereinigung), Claudia GRASLl (Kinder- und Jugendanwaltschaft Wien), Daniel LANDAU (Bildungskoordinator), Sandra MEISER-LANG (Bildungsgarten Graz), Melina SCHNEIDER (Wirtschaftskammer Österreich), Natascha J. TASLIMI (Pädagogische Hochschule Wien & Netzwerk elementare Bildung Österreich)

„Die Zukunft der Stadt geht in den Kindergarten" sagte der damalige Stadtrat für Bildung zum Tag der Elementarbildung 2019 — ein deutliches Statement für die Wichtigkeit von institutioneller Elementarbildung und Betreuung im Hinblick auf die Bildungschancen unserer Kinder. Und gleichzeitig eine Anerkennung der hohen Anforderungen an das pädagogische Fachpersonal.

Kinder erwerben in elementaren Bildungseinrichtungen grundlegende Kompetenzen für ihre kognitive Entwicklung, die für ihre weitere Bildungslaufbahn einen hohen Wert darstellen.

Im Kindergarten/in der Kindergruppe lernen Kinder z.B. demokratische Entscheidungsprozesse zu verstehen, sich in einem sozialen Gefüge zurecht zu finden und Teil einer Gruppe zu sein, Partizipation und Verantwortung für Handlungen zu übernehmen sowie ko-konstruktive Bildungsprozesse zu initiieren und gestalten.

Elementarpädagogen:innen schaffen ein anregendes Lernumfeld, das Kindern vielfältige Möglichkeiten der eigenständigen Auseinandersetzung mit Materialien und Spielsachen erlaubt. Durch gezielte Beobachtung und Dokumentation lernt das Fachpersonal jedes Kind besser kennen und fördert die jeweiligen Stärken und Ressourcen. Im Austausch mit den Familien wird die Entwicklung von Kinder reflektiert und Anregungen vorgeschlagen.

Anders als in der Schule lernen Kinder unter sechs Jahren ohne Leistungsdruck im und durch das Spiel. Sie haben Zeit durch professionelle und liebevolle Begleitung der pädagogischen Fachkräfte in ihrer individuellen Entwicklung zu wachsen.

Stabile Beziehungen zu Elementarpädagogen:innen und hohe Interaktionsqualität sind gute Voraussetzungen für die Persönlichkeits- und Lernentwicklung von Kindern.

Wir stellen mit dem Narrativ Elementarpädagogik ein „good practice" Beispiel, den Bildungsgarten in Graz, vor, legen Daten aus der Hirnforschung vor (Schlagwort: „Soziales Gehirn"), erläutern den Gewinn und Nutzen elementarer Bildung für das einzelne Kind sowie die Gesellschaft und stellen dar, warum sich die Investition in die Zukunft unserer Kinder auch aus volkswirtschaftlicher Perspektive lohnt.

5.3 Interviews

FISCHER B.
Warum die Geburt für Menschen gefährlicher ist als für Makaken
Interview by J. Sical for the Austrian newspaper "Der Standard"
https://www.derstandard.at/story/3000000239495/warum-die-geburt-fuer-menschen-gefaehrlicher-ist-als-fuer-makaken

GILBERT SF.
Revisiting Gilbert 2001
Interview by H. SRIDHAR for "Reflections on Papers Past"
https://reflectionsonpaperspast.com/2024/11/10/revisiting-gilbert-2001/

LALA KN.
Revisiting Lala et al. 2015
Interview by H. SRIDHAR for "Reflections on Papers Past"
https://reflectionsonpaperspast.com/2024/07/08/revisiting-laland-et-al-2015/

LE MAITRE A.
Warum haben Seekühe und Delfine fast gleiche Ohren?
Interview by J. Riedl for the Austrian newspaper "Die Presse"
https://www.diepresse.com/18881656/warum-haben-seekuehe-und-delfine-fast-gleiche-ohren

LE MAITRE A.
Why do we have earlobes? They make no evolutionary sense.
Interview by L. Leffer for the international magazine "Popular Science"
https://www.popsci.com/science/why-do-humans-have-earlobes/

MÜLLER GB.
Revisiting Müller 2007
Interview by H. SRIDHAR for "Reflections on Papers Past"
https://reflectionsonpaperspast.com/2024/09/27/revisiting-muller-2007/

SARTO-JACKSON I.
Wie wir Kinder optimal fördern
Interview by B. Zeithammer for Austrian National Radio Ö1 "Punkt Eins"
https://oe1.orf.at/programm/20240624/760793/Wie-wir-Kinder-optimal-foerdern

SARTO-JACKSON I.
Missbrauch und Stress verändern das junge Gehirn
Interview by C. Grobner for the Austrian newspaper "Die Presse"
https://www.diepresse.com/18977317/missbrauch-und-stress-veraendern-das-junge-gehirn

SARTO-JACKSON I.
Elementarpädagogik: Die bedeutendste Investition in die Zukunft!
Interview by T. Strobl for "schule.at – digital school portal"
https://www.schule.at/bildungsnews/detail/elementarpaedagogik-die-bedeutendste-investition-in-die-zukunft

5.4 Acknowledgment

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