



activities of the **KLI**

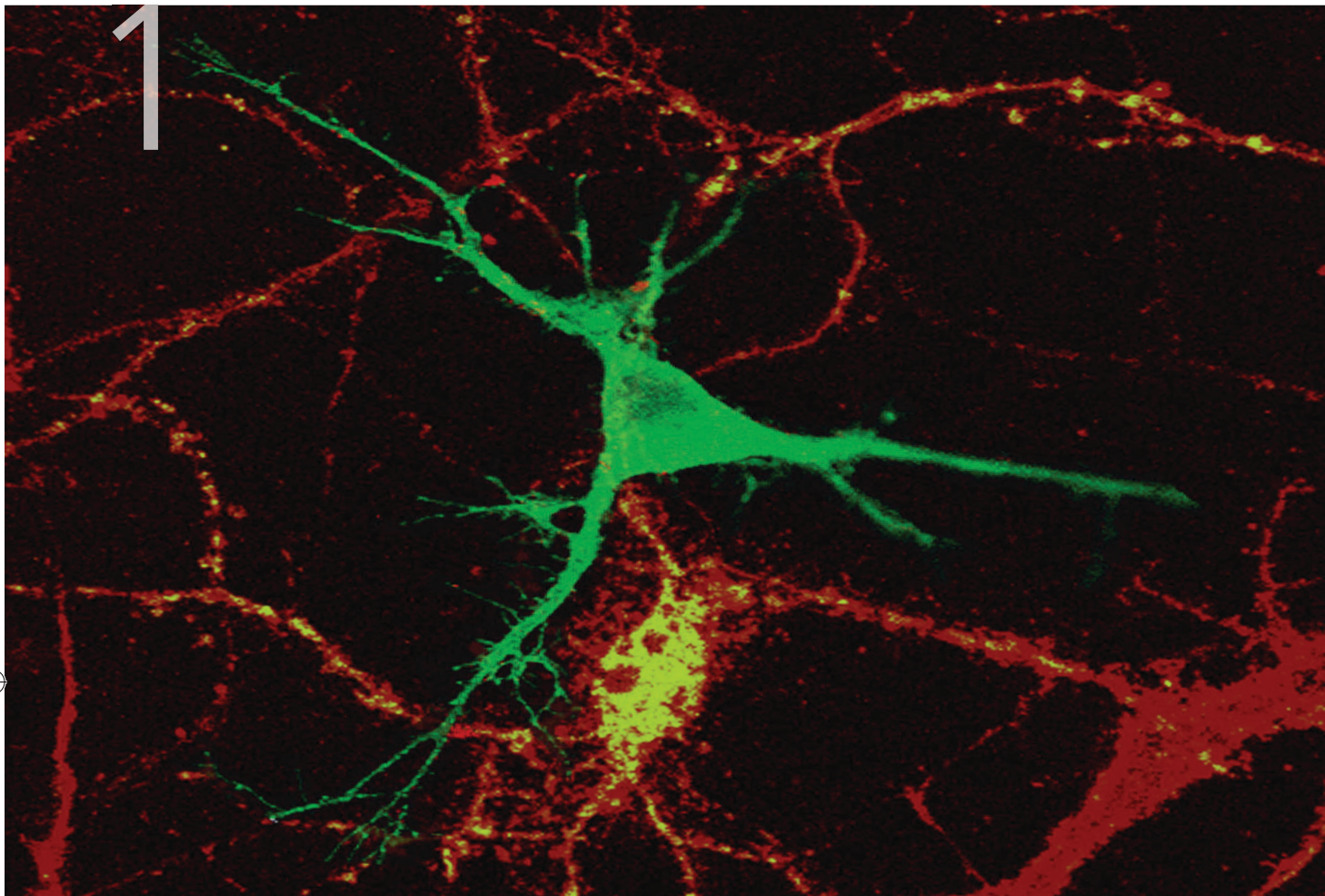
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Review 2023 and Structure of the KLI



Η υπέροχη έπαυλη που φιλοξενεί το KLI είναι ένα από τα λίγα μέρη στην Ευρώπη όπου οι βιολόγοι, οι ιστορικοί και οι φιλόσοφοι μπορούν να συναντηθούν και να μοιραστούν τις προοπτικές τους σε σχέση με τις επιστήμες της ζωής.

The wonderful mansion that hosts the KLI is one of the few places in Europe where biologists, historians, and philosophers can meet and share their perspectives on the life sciences.

*Sabina Leonelli
Exeter Centre for the Study of the Life Sciences
(Egenis), University of Exeter &
Technical University of Munich (TUM)*



1.1 The Year in Review

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In 2023, the first full post-COVID year, the KLI again hosted not only an excellent group of fellows, international visitors and guests, but also a series of events, including a workshop and a focus group. In this year, the KLI's long-term president, Gerd Müller, celebrated his 70th birthday and stepped back from his position. As the new president of the KLI, I deeply thank Gerd for his immense intellectual, emotional, and administrative investments – and often also his craftsmanship – for building up and leading the KLI during the past 25 years. Gerd will continue to be an important part of the KLI team as honorary president and head of the scientific advisory board.

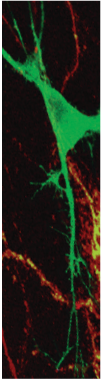
I am committed to ensure that the KLI remains an attractive place for creative and interdisciplinary scientific engagement, critical scholarship, and intellectual risk taking. To this end, I am establishing three long-term working groups at the KLI: one on evolutionary theory and evolutionary medicine, one on the evolution of cognition, and one on philosophy of biology. But also outside of these main themes, the KLI continues to welcome innovative applications from scientists and scholars in the life sciences, cognitive science, and philosophy of science. Additionally, I plan to strengthen the external faculty and to increase the number of early career fellows.

I am very grateful to the KLI team, Guido Caniglia, Barbara Fischer, Isabella Sarto-Jackson, and Maria Yurdakul, for running the KLI so successfully and for steering it smoothly through past challenges. 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.

Philipp Mitteroecker
President



1.2 The KLI



- 4 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, sustainability science, 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

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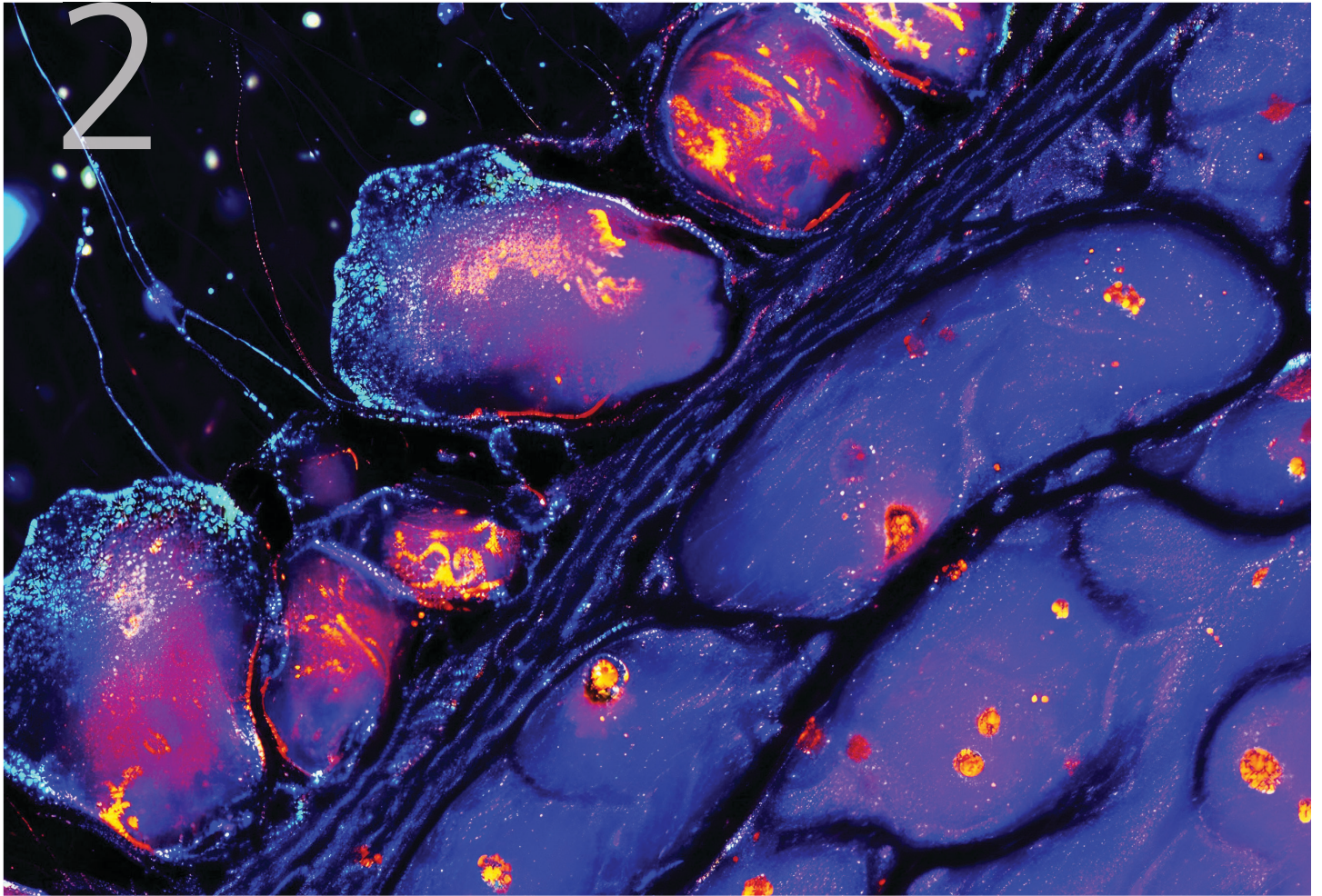
DR. STEFANIE WIDDER

Austrian Academy of Sciences & 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

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In 2023, the KLI received a total of 121 applications for fellowships in residence, 7 of these were granted for 2023 or 2024. In addition, 12 visiting fellowships were granted for visiting scholars who stayed at the KLI in 2023.

	applied	granted
Writing-Up Fellowships	17	1
Postdoctoral Fellowships & Senior Fellowships	104	6

2.2 Writing-Up Fellowships

Anna-Katharina BRENNER

(May – October 2023)

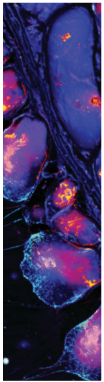


Anna-Katharina Brenner is a PhD candidate and research associate at the Institute of Social Ecology at the University of Natural Resources and Life Sciences (Vienna, Austria). Her fields of interest are environmental justice and geography of sustainability transitions focussing on (peri-)urban areas. On these issues, she is carrying out interdisciplinary research considering both socio-metabolic and political / institutional implications.

The Critical Role of Built Infrastructure for the Transformation towards Sustainability

The co-evolution of built environments and set-up of formal and informal rules and actions contribute to path dependencies concerning the material-, energy-, and carbon-intensive technologies and settlement patterns that drive the climate crisis and





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social-ecological inequalities. Cities play, here, an important role as they accumulate high shares of built environments. Compact urban forms are widely discussed to increase energy and material efficiency but only when supplemented with other low-carbon interventions and considering the quality of life.

My dissertation project is an explicit interdisciplinary endeavor connecting the socio-metabolic lens on urban built environments with informal and formal rules and actions shaping their materialization, while in turn, they are shaped by the existing long-lasting material structures. I research two examples, firstly, experiments with superblocks in Vienna; secondly, 35 years of expansion and densification patterns in the city of Vienna. In both examples, I applied mixed methods, i.e., statistical analysis, geodata analysis, document analysis, stakeholder interviews, and explorative expert interviews. Further, I design my research in cooperation with partners from the field of traffic modeling, health assessments, remote sensing, and spatial data science.



Alejandro FÁBREGAS-TEJEDA

(October 2022 – April 2023)

Alejandro Fábregas Tejeda is a Philosophy PhD student at Ruhr-University Bochum under the DFG-Emmy Noether Research Group "The Return of the Organism in the Biosciences: Theoretical, Historical, and Social Dimensions." Recently, he has been awarded a KLI Writing-Up fellowship to complete his PhD thesis.

Re-appraising the Organism-Environment Relationship

The organism-environment relationship plays a central role in how different theories and scientific practices of the life sciences are structured and conducted. However, understanding how this relationship has been construed remains an open problem that has not been sufficiently examined by historians and philosophers of science. In this project, I seek to explore what kind of relationship is instantiated when 'organism'



and 'environment' are considered relata. If both are said to stand in a relation of reciprocity, what is entailed by this claim? Is this relationship wholly symmetrical or are there some particular characteristics of these relata which break the symmetry of the pairing? I assess different understandings of organism-environment reciprocity in contemporary and historical debates across the life sciences: in particular, I focus on ontological co-constitution, mutual structural fitting, concomitant reaction, and reciprocal causation. In addition, I peruse what separates an organism from its environment (if anything) and what constitutes the foundational asymmetries of this relationship. I contend that only the former relatum (i.e., an organism), though deeply embedded and causally affected by its surroundings throughout its ontogeny, is a self-individuating entity and a bounded locus of causation (i.e., an agent) which performs goal-directed actions and exhibits intrinsic normativity.

David HARRISON

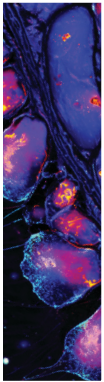
(October 2022 – March 2023)



David Harrison is a Research Assistant at the LCFI and Templeton World Charity Foundation. He specifically works on 'The Major Transitions in the Evolution of Cognition' project, which is dedicated to understanding the emergence of complex minds in terms of a set of 'major transitions' in the kinds of information processing systems that emerged during evolutionary history.

Additionally, David is a 3rd year PhD student in the History and Philosophy of Science Department at the University of Cambridge. His research addresses a cluster of intersectional issues based in the philosophy of biology, cognitive science, and artificial intelligence. His PhD project focuses specifically on 'biogenic' accounts of cognition, which sees embodiment, affectivity, valence, and materiality as the context and





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lens through which the evolution of cognition, mind, and ultimately consciousness should be understood. Before Cambridge, David completed studies at King's College London and the University of Edinburgh.

Materiality and Mindedness: The Biogenic Approach to Mind and Life

My research addresses several issues that intersect philosophy, Artificial Intelligence [AI], and biology — with a specific interest of mine turning around the blue-sky goal of creating Artificial General Intelligence [AGI] within an alternative medium – such as a digital computer or a synthetic robot. Simply put, the goal of exploring cognition and mind through the lens of embodiment and valence is to explore ways in which robust forms of cognition (the domain general and generalisability in the ‘G’ of AGI) relates intimately with the possibility of risk-to-self to an agent. In other words, if cognition intrinsically involves meaningful, goal-directed engagement with the world, then this engagement is heavily saturated with possibilities for the agent to maintain itself and adapt to incoming information. One promising starting point for understanding this is the biological basis of minded creatures: from sophisticated animals with complex nervous systems like octopi and humans to lower or, more properly, ‘basal’ organisms such as nematodes and even bacteria and slime moulds — a perspective that has been explored extensively under the heading of the ‘biogenic account’ of cognition (Levin 2019, 2020; Lyon et al. 2021). This account places a premium on the vulnerable, heavily embodied, and metabolic dimensions of agency and goal-directedness as the basis from which we should understand the origins of mindedness in evolutionary history. As Peter Godfrey-Smith has remarked in the context of computers, “a collection of ands and if-thens [the Boolean logic of discrete maths underpinning classical computers] with no metabolic point to them would be a different sort of thing” (2016: 490). It then attempts to generalise this to a broader theory of cognition and its physiological basis.





Lauren Marie LAMBERT

(October 2022 – April 2023)



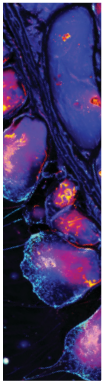
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Motivated by the desire to transcend political aporia – in which communities feel they must choose between two bad choices – with creative solutions being the biggest driving force in her work and life. At ASU Lauren seeks to design research at the intersection of environmental policy and nature / society studies, to investigate how political decision-making takes place across different scales within complex global systems in support of social-ecological thriving in urban environments. To better understand the socio-economic factors underlying resilience, she investigates how people’s capacity to envision their available responses to climate change affects institutional decision-making in urban policy and planning. Current focus includes game theory, decision making, natural resource economics and complex adaptive system science. Lauren is an avid yogi and hiker with a love for travel and dark roast coffee.

Cultivating Coherence in Sustainability: Social, Futures, and Ecological Empathy

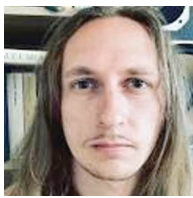
My work at KLI will constitute a final synthesis across the three studies of my dissertation. From the perspective constructionism, I will articulate the significance of cognitive bias in limiting coherence across social groups, time, and species. I will situate practice (Ortner 1984; Bourdieu 1977) and imagination at the theoretical core of my work on enabling human collaborative potential (Anderson 1991; Harari 2014). Then, I will articulate how cognitive biases limit imaginative potential and connection across difference in decision making environments in ways that stifle collaboration for sustainability. Expanding from the history of the concept of empathy (Wispé 1987), which was born among the aesthetics, I will move from the historical and evolutionary perspective of intra-group empathy (Waal 2009) toward a perspective of inter-group social (E. A. Segal 2011), inter-generational futures and inter-species eco-





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logical empathy. In making this move, my synthesis work at KLI will retheorize empathy as foundational to circumventing cognitive bias and increasing coherence between people, time horizons, and species, in the Anthropocene.



Jonatan PALMBLAD

(October 2022 – April 2023)

Jonatan Palmlblad is a cross-disciplinary scholar primarily focusing on the workings of human–environment interaction, and the role that psychology and technology play therein. He is a PhD candidate in Environmental Humanities affiliated with the Rachel Carson Center for Environment & Society, LMU Munich, and is currently a writing-up fellow at the KLI. In his dissertation, Jonatan looks at the public intellectual and self-proclaimed generalist Lewis Mumford (1895–1990), who early on engaged with the problems later framed as the Anthropocene, using him as a prism to understand present and future issues from the standpoint of the past. Jonatan’s interdisciplinarity encompasses, but is not limited to, philosophy, history of ideas, history of technology, human ecology, ecocriticism, and environmental psychology. He has a BA in Liberal Arts and an MA in History of Science and Ideas from the University of Gothenburg, Sweden.

Synthesis and Sustainability: A Historical Approach to the Ecological Crisis

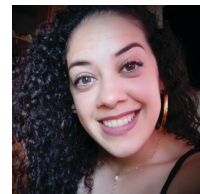
The purpose of this project is to make my historico-philosophical dissertation relevant in today’s increasingly important debate on sustainability. At the same time, this is where I aim at inserting my own voice. My contribution to the scholarship on Lewis Mumford is already clear: I have outlined the philosophy behind his works, a topic that has previously only been touched upon but never fully grasped. From the very start, however, I have had the aim of going beyond the research



of a single human being in history by contributing to the research on the present course of human development; at the KLI, I will have an optimal opportunity to make my historical research useful and applicable in this context. Supported by Mumford's evolutionary ideas, cognition and knowledge were paramount features of his philosophy on human-environment interaction. His contention that we must understand technology as a cultural-cognitive phenomenon — and reconceive it — if we are to achieve what is now called sustainability deserves to be considered, but not without reservation and scrutiny. The research that I have previously conducted sheds light on the present from the past; my research at the KLI will illuminate the past from the scientific standpoint of the present.

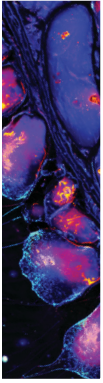
Ilvanna SALAS LEÓN

(October 2022 – April 2023)



Ilvanna Salas León is a passionate scientist with interdisciplinary interests. Some of her areas of interest are sociogenomics, evolution, systems biology and complexity science. In her research, Ilvanna aims to integrate evolutionary theories with genomic and social information to improve understanding of the coevolution between genomes and social behaviors. She holds a Bachelor's degree in Biology from the Universidad de Los Andes de Venezuela. She is a PhD candidate in Integrative Genomics at the Universidad Mayor, Santiago de Chile. She is based at the GEMA Center for Genomics, Ecology & Environment where she conducts research on the relationship between genome architecture and social behaviors under the supervision of Sebastián Abades. In 2021, she was a research intern at Rudolf Hanel's lab at the Institute of the Science of Complex Systems of the Medical University of Vienna. She has recently been awarded a Writing-Up fellowship at the KLI to complete her thesis. In her free time, Ilvanna enjoys doing sports like kick-boxing, aerial silks, and biking.





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Relationship between Sociality and Genome Architecture

The main goal of this thesis is understanding the relationship between genome architecture and levels of sociality in mammalian species. I integrated information from genomic, life history traits and behavioral sciences into a relational database, in order to enable comparative and multivariate analyses. Partial results suggest that genome architecture can be helpful to explain sociality differences between species. My project at the KLI focuses on discussing results and integrating the information into a framework paper as well as maturing the conceptual ideas that enable the study of sociality by using a holistic approach, including social, biological and life history traits information, aiming at making inferences about molecular architectures of certain traits and gaining insights into the coevolution of genetic and phenotypic traits.



Daniel STADTMAUER

(September 2023 – February 2024)

Daniel Stadtmayer 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



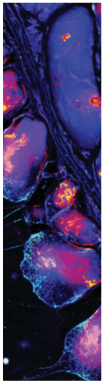
apply technology such as single-cell RNA sequencing to study gene expression in the pregnant uterus and to characterize the diversity of cell types within the decidua of placental mammals, the maternal tissue that supports the fetus during extended gestation. He has been awarded a KLI writing-up fellowship to complete his PhD thesis.

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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.





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2.3 Postdoctoral Fellowships

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

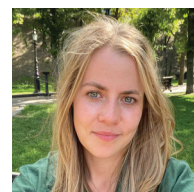
Modern biology is a primarily discursive endeavor. Researchers acquire and contribute the majority of their knowledge of biology through communication with other researchers in the form of scientific research, review articles, and presentations. This project explores the ways our interpretation of life 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.

Marina KNICKEL

(October 2022 – February 2024)

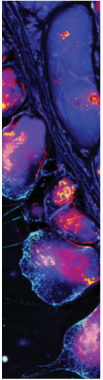


Marina Knickel was a junior researcher at the Department of Agriculture, Food and Environment of the University of Pisa and a guest researcher at Wageningen University (the Netherlands) and Baltic Studies Centre (Latvia) working in two projects: Horizon 2020 project ROBUST on rural-urban relations and 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 (research-practice partner teams). Her research interests include co-learning processes in trans-disciplinary research around agri-food and rural-urban issues, science-policy-practice collaboration, and functioning of the Living Lab approach in multi-actor research projects.

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





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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.

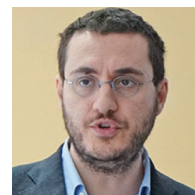
My research will build on a two-step iterative research design whereby theoretical and empirical explorations will be mutually reinforcing. The qualitative and quantitative data available for the analysis comprise three online surveys providing longitudinal data over 4 years and multiple interviews with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



Enrico PETRACCA

(September 2023 – August 2024)



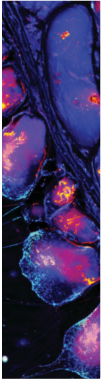
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Enrico Petracca has been a senior fellow at KLI since September 2023. His work at the intersection of economics, “embodied” cognitive science, and the philosophy of mind aims to introduce a novel notion of rationality called “embodied rationality”. 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.





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Ludo SCHOENMAKERS

(October 2023 – September 2024)

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

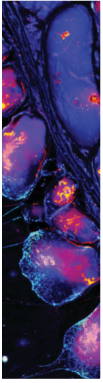


at its application to an ontologically and epistemically closely neighboring domain. One such domain is the emergence and early development of life as studied within Origins of Life (OoL) and synthetic biology research. In both of these fields, complex molecular systems ranging from autocatalytic reaction 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.





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Marco Paulo VIANNA FRANCO

(October 2020 – January 2023)

Marco Paulo Vianna Franco is a professor and researcher in applied sciences and public policies at Fundação João Pinheiro (Brazil). He received a PhD in economics from Cedeplar / UFMG with a dissertation on the history and philosophy of ecological economic thought. He is interested in human-nature relations from the perspectives of political economy, intellectual history, and philosophy of science.

A History of Ecological Economic Thought

The project focuses on the development of a book manuscript to be published by Routledge in 2022. Its aim is to provide a historical account of the development of a set of ideas referred to as ecological economic thought, i.e., a body of knowledge presenting substantial articulations between ecology and economics. The latter is described by means of analyses of flows and stocks of energy and matter in complex socio-ecological systems, including their implications for processes of social provisioning and cultural development. It entails a biophysical and (co-)evolutionary approach to economic science, as well as philosophical views on the relations between humans and their environment, such as nature as a source of value, moral aspects regarding natural resource distribution, and technological and behavioral transformations.



Luis Alejandro VILLANUEVA HERNÁNDEZ

(January 2021 – March 2023)

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



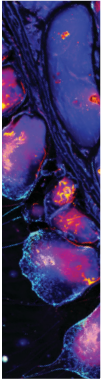
to June 2016 he did a PhD stay research under the supervision of Professor Ian Cross in the Centre for Music and Science at the Faculty of Music of the University of Cambridge. In his PhD dissertation, supervised by Professor Sergio F. Martínez, he explored models of niche construction, material culture 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 has previously received a KLI writing-up fellowship to complete his PhD thesis.

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





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a particularly rich cultural expression in which these interrelational processes can be explored.

The process through which individuals acquire a repertoire of musical 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.





2.4 Senior Fellowships

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Laura MENATTI

(October 2022 – September 2024)



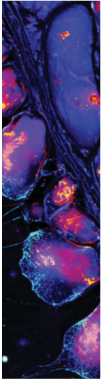
Laura Menatti specialised in environmental philosophy, landscape theory and philosophy of medicine. Her research aims at developing a theoretical and practical framework for the investigation of the notion of environment and its effects on health. During her research career, she has pursued an interdisciplinary 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 (Spring Term 2022) 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 (Spain).

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).





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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 independent boundary 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.



Hari SRIDHAR

(October 2022 – September 2024)



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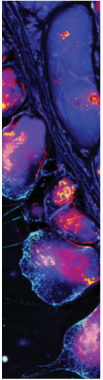
Hari Sridhar is an independent researcher based in Bangalore and an honorary fellow of the Archives at NCBS (National Centre for Biological Sciences). Hari is involved in two longform interview-based projects examining the contemporary history of conservation in India, especially in relation to the intersection of ecological knowledge and conservation practice. Over the last seven years, Hari has also lead another interview-project with authors of classic papers in ecology, evolution and behaviour, which he posts on the blog <https://reflectionsonpaperspast.wordpress.com> Hari's other major research interest lies in understanding the causes and consequences of heterospecific sociality, a topic he has researched during his PhD and post-doctoral research at the Indian Institute of Science, Bangalore. In addition to doing research, Hari guest-teaches ecology and ornithology at various research institutes and colleges in India, and has been an editor of the Current Conservation magazine.

An Elephant in the Room? The Place of Science and Scientists in Conservation Decision-Making in India

While there is general consensus about the existence of a knowledge-action gap in the fields of ecology and conservation, its causes are hotly debated. Broadly, this debate can be characterised as having two dominant perspectives. One perspective is based on the idea that knowledge always flows unidirectionally, from scientist to practitioner, and the gap is mainly a consequence of inadequacies in the generation, communication and/or use of scientific knowledge. This perspective has come, mostly, from inside science. The other perspective is based on the idea that knowledge flows bi-directionally between scientist and practitioner, i.e. it is co-produced, and the gap exists because of the lack or infrequency of interactions between scientist and practitioner. This view has come mainly from outside science.

Independent of this debate, knowledge, whether produced only by scientists or jointly by scientists and practitioners, is believed to inform practice in different ways, including instru-





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mentally, conceptually and symbolically. In this project, I would like to provide empirical grist to these theoretical mills using two approaches: 1. Focussed, in-depth interviews of scientists about their personal experiences in attempting to create ecological knowledge useful for conservation action; 2. Systematic analysis of scientific evidence used in conservation decision documents (e.g., policy documents, park management plans, environmental impact assessments etc.).

This project will be focussed on India, which presents a unique case in the global debate on the science-conservation gap. Conservation science in India is largely based upon ideas and theories from the west (what one might call Michael Soulé's Conservation Biology (Soulé 1985)). At the same time, India's historical resistance to foreign scientists working within its borders has meant that its conservation biology community consists mostly of Indians; in contrast to other countries of the global south, where conservation biology is dominated by scientists from the global north. Indian conservation scientists, while engaging with western conservation biology, have had their ears closer to the ground, questioned conservation biology's relevance and taken a much more bottom-up approach to engaging with conservation action. The Indian conservation scientist community is, therefore, likely to contain a wealth of unique experiences and perspectives related to science's role in conservation. I hope that the findings from the proposed project will help paint a nuanced picture of how science, both in intended and unintended ways, informs and engages with conservation practice, and point the way towards more effective use of science in solving our growing environmental problems.



Marco TREVEN

(January – May 2023)

Marco Treven is an MD / PhD and resident at the Department of Neurology, Medical University of Vienna (MUW). He received his PhD in neurobiology from the

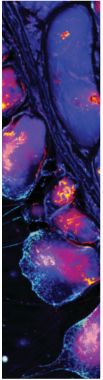


MUW with a dissertation about extrasynaptic GABA(A) receptors in neurological disorders and basal ganglia. Building on this pharmacological work, he has developed a particular focus on movement disorders and deep brain stimulation. He is interested in deliberate, automatic, and repetitive human behavioral patterns, expressed in movement and abstract cognition, and how such patterns are related to generative internal models or beliefs. In this context, he aims to expand the cognitive framework of Predictive Processing to neurological disorders and extended / distributed cognition. This includes the notion of individually and culturally shaped affordances and the principles of active inference, prediction error minimization, and determinants of belief revision. The potential relevance of this work extends from a better understanding of neuropsychiatric disorders to the interplay between public health and sustainable behavior within environmental niches.

Applying Predictive Processing to Behavioural Patterns in Neuropsychiatric Disorders and Distributed Cognition

Predictive Processing (PP) is a cognitive framework based on the principle that sentient systems (and specifically nervous systems) strive to anticipate homeostatic imperatives by minimizing prediction errors in immediate action-perception loops and detached, abstract cognition. PP provides the tools and language to describe how generative models or beliefs are constructed and dynamically handled through prediction error minimization. Overweighted high-level generative models or beliefs are increasingly recognized in neuropsychiatric disorders, underpinning maladaptive patterns and habits of movement, behavior, and thought. Understanding which factors might catalyze the flexible revision of generative models is relevant not only for neuropsychiatric disorders but also for maladaptive aggregate human behavior resting on overweighted socially and culturally held beliefs. This aggregate-level likely has emergent properties beyond the sum of individual preferences. The project outlined here aims to explore how PP can help understand





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and overcome rigid, stereotyped behavioral patterns resulting from overweighted generative models implemented in different, evolutionarily nested levels of cognition. Firstly, existing evidence will be recapitulated and synthesized regarding how generative models are structurally implemented at different levels of cognition, including extended/group/distributed cognition, and how they determine deliberate and automated behavioral trajectories. Secondly, potential parallels, analogies, and metaphors will be explored to understand maladaptive models at supra-individual cognitive levels. This approach will be positioned into a long tradition of extrapolating and understanding the interdependencies between individual and public health and how they interact with the environment. Accordingly, PP might become applicable for sustainable aggregate human behavior on a planet that is increasingly transformed by particular dominant, culturally held belief systems. Such an approach might help to revise conventional beliefs about human nature, from maximizing reward to maximizing feedback-driven adaptive fitness within ecological niches. Finally, specific novel experimental methodologies will be explored that are suitable to investigate belief revision.





2.5 Visiting Scientists

Tudor BAETU

(September – October 2023)

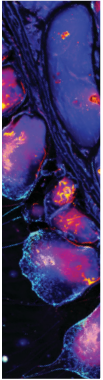
Tudor Baetu received a master's degree in microbiology and immunology from McGill University and a doctorate degree in philosophy from Université de Montréal. He held post-doctoral positions at the University of Maryland (College Park, USA) and the Konrad Lorenz Institute (Klosterneuburg), followed by an associate professor position at Universidade do Vale do Rio dos Sinos (São Leopoldo, Brazil). He was a lecturer in philosophy of science at the University of Bristol and is now Associate Professor at the Université du Québec à Trois-Rivières (UQTR) in Canada.



The Methodology of Interdisciplinary Research: The Case of Pain

Pain research offers one of the best examples of interdisciplinarity. More than four decades ago, Melzack and Wall famously proposed that the quality and intensity of pain experience are modulated by a neural circuit integrating inputs from nociceptors and information from brain areas associated with cognitive and emotional appraisal. The proposal opened the door to a variety of biopsychosocial models according to which pain experience is determined by the interaction among biological, psychological and social factors (1). Not only these models account for the multiple phenomenological dimensions of pain experience, they also correctly predict that pain can be controlled by a wide variety of means, from pharmaceutical interventions to cognitive-behavioural therapy. Yet, despite these successes, many aspects of interdisciplinary research are poorly understood. Different disciplines rely on different experimental techniques, standards of explanatory relevance,





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theoretical backgrounds, and sometimes even different metaphysical assumptions. This raises important questions that have not been satisfactorily addressed in the philosophical and scientific literature. In particular, it is not clear what justifies the aggregation of empirical findings generated by different disciplines, and how the claim that outcomes are the result of interactions between biological, psychological and social causes should be understood from an epistemological and metaphysical standpoint. The goal of my current project is to address these questions by providing a philosophical analysis of the methodological foundations of interdisciplinary research and of their epistemological and metaphysical implications.

**Gillian BROWN**

(June – July 2023)

Gillian Brown is professor at the School of Psychology & Neuroscience of the University of St. Andrews. Her main research interest is sex / gender differences in behaviour in human beings and other animals from evolutionary and neuroendocrine perspectives. This research field is characterised by polarised debates between those who favour 'biological' explanations for sex / gender differences and those who stress the importance of social and cultural factors. She has consistently taken an interdisciplinary approach, arguing that we need to understand how both physiological processes (e.g., early gonadal hormone exposure) and social environments (e.g., gender stereotypes) shape behavioural development across individual and evolutionary time spans. Her research has three strands: i) human experimental research investigating how sex / gender differences in performance on behavioural and cognitive tasks are influenced by stereotypes and social learning), ii) lab-based research investigating the effects of manipulating early gonadal hormone levels on behavioural development in infant, juvenile and adolescent rodents and non-human primates, and



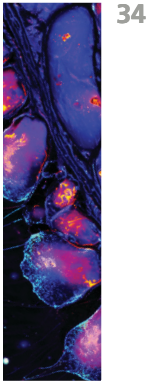
iii) theoretical research showing that we can apply evolutionary theory to understanding human behaviour in a way that avoids deterministic accounts and acknowledges the role of culture in the evolutionary process.

Promoting a Progressive Vision of Evolutionary Science

The field of evolutionary biology is changing. New ideas are flooding into it from evolutionary developmental biology, epigenetics, ecology, genomics, the human sciences, and many other disciplines. According to leading evolutionary biologist, Stevan Arnold (2014) “to synthesize this information we need diverse perspectives, and bridges between them”. One such novel perspective is the Extended Evolutionary Synthesis, or EES (Pigliucci & 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 biology. These resources potentially take many forms. Most obviously, books are of central importance. To be compelling, any such summary requires a detailed review of new findings, explanations for how they support new ways of thinking, but must also address philosophical and historical issues, rebutt counterarguments, and spell out practical implications. Only book-length treatments can achieve this aim. The EES conceptual papers (e.g., Laland et al 2014 Nature; Laland et al 2015 Proc R Soc B) are very well-cited (>800 and >1000 cites, respectively); however, there is a limit to what can be achieved in the brief format of a scientific article. The “message” is too complex and multifaceted to be effectively transmitted in paper format. While edited volumes and other published books are making





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an important contribution to this debate (e.g., Jablonka & Lamb, 2005; Pigluicci & Müller, 2010; Noble 2017; Nuno de la Rosa & Müller, 2021), they typically lack the coherence and readability, and/or are pitched at a more technical level, to have a broad impact. Scientific books that are comprehensible to a wider audience are now required, as are tools for their promotion.



Benedikt HALLGRIMSSON

(May – June 2023)

Benedikt Hallgrímsson is an international leader in the quantitative analysis of anatomical variation. His work focuses on structural birth defects and the developmental genetics of complex traits as well as the conceptual foundations of evolutionary developmental biology. He integrates 3D imaging and morphometry with genetics and developmental biology. He was awarded the Rohlf Medal for Excellence in Morphometrics in 2015 and is a Fellow of the American Association for the Advancement of Science and the Canadian Academy of Health Sciences (2020). He has published >170 journal articles, 32 chapters, three edited volumes, and a textbook. Hallgrímsson has held leadership roles at the University of Calgary where he led creation of the Bachelor of Health Sciences and co-led the successful proposal to create a Faculty of Veterinary Medicine. He is currently Deputy Director for the Alberta Children's Hospital Research Institute and Head of the Department of Cell Biology & Anatomy.

Development and Evolvability: The Conceptual Foundations of Evo-Devo

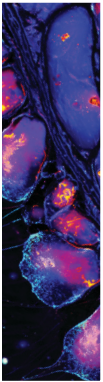
The study of the relationship between development and evolution has deep historical roots but has only recently emerging as a distinct academic discipline. Evolutionary developmental biology is a trans-discipline in the sense that it fuses elements of evolutionary and developmental biology



as well as genetics around a set of questions, perspectives and concepts that are distinct from these three fields. Along with Hendrikse and Parsons, I have previously argued that the central question of evolutionary developmental biology is the developmental basis for evolvability. A key element of this argument is that fields orient themselves around overarching questions and that much of the work that falls under the banner of this new field of evolutionary developmental biology centers on this key question. We argue that evolutionary developmental biology seeks to generate explanations of evolution and biological diversity that draw upon the generation of variation by developmental processes or to modify such explanations in light of how variation is generated by development. To accomplish this, evolutionary developmental biology draws upon a set of concepts that, together, form the scaffold on which these explanations are built.

What are these core concepts that form the scaffold for explanations about evolution and development? Do these concepts relate to each other in a coherent way? Is that even a question to which there is an objective answer? This is the question that I plan to tackle in a monograph on the conceptual foundations of evolution and development. This would address an important gap in knowledge because the epistemology of this new field that lies at the intersection of evolution and development is still very much unresolved. The core concepts about incongruously in the current literature. Their use is rife with conflation of pattern and process as well as definitional drift that diminishes the utility of these concepts for meaningful explanations. Examples of conflation due to such drift include the delineation of canalization versus phenotypic plasticity, modularity versus integration, modules versus characters, and integration or allometry versus heterochrony. It would be naïve to think that there is one objective way to impose coherence on the relations among these concepts. However, this does not mean that attempting to create a coherent account of the conceptual foundations of evolution and development is without value. Doing so will help resolve areas of confusion that impede the use of these concepts. It may also reveal concepts that may have outlived their utility or are in need of significant revision as well as areas of uncer-





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tainty that would benefit from further debate. Finally, this effort is likely to stimulate further discussion related to defining the conceptual foundations of evolution and development, which will bring a much-needed focus on the emerging epistemology of this important field.

This project is timely because evolutionary developmental biology is new and its conceptual foundations are fluid. There is also a broader trend towards the blurring of disciplinary lines in both biological and social sciences research. When this happens, conceptual frameworks can collide or misalign, particularly when key differences in concepts across fields are not recognized. This happens frequently in evolution and development because the conceptual frameworks of evolutionary biology, genetics and developmental biology are often incongruent. Variation is similarly positioned in evolutionary biology and genetics, but not in developmental biology. Epistasis means something quite different to a developmental biologist compared to a population geneticist. Most importantly, though, central motivating questions can be orthogonal. Defining and then working through these issues of incongruence for evolutionary developmental biology can serve as a relatively simple case study for transdisciplinarity that is simpler than other such projects that are currently attempting to blend social science and biomedical frameworks, for example.

An account of the conceptual foundations of evolution and development cannot be divorced from the history the component concepts. Concepts are continually reinvented and redefined in light of current knowledge as well as shifting research agendas and priorities. Morphological integration may draw upon Darwin's laws of correlations of growth, but this is not really the same idea articulated by Olson and Miller. Integration is different again in the hands of Wagner and yet again when viewed through my palimpsest model or by Mitteroecker. As they are reinvented and as research priorities shift, relations among concepts also change. Allometry and integration have distinct origins, for example, but within the palimpsest model, allometry is simply a special case of integration where the covariance patterns result from processes that influence overall growth. Canalization and developmental stability are difficult to disentangle in Waddington's or



Schmalhausen's work and yet these concepts have emerged as foci of quite distinct research agendas with different practitioners. Epigenetics originally referred to the 'cybernetics' or system-level properties of development and yet now means something completely different. Many of the individual concepts tackled in this project have been the subject of historical analysis. However, this work will add to this existing literature by emphasizing the history not just of these concepts but the evolving connections among them that forms the conceptual framework for evolution and development.

Kevin N. LALA

(June – July 2023)

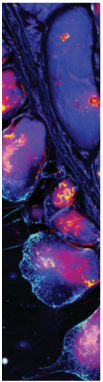


Kevin N. Lala is an evolutionary biologist and Professor of Behavioural and Evolutionary Biology at the University of St. Andrews. Educated at the University of Southampton and University College London, he was a Human Frontier Science Program fellow at the University of California, Berkeley before joining the University of St. Andrews in 2002. He is one of the co-founders of niche construction theory and a prominent advocate of the extended evolutionary synthesis (EES). He is a fellow of the Royal Society of Edinburgh and the Society of Biology. He has also received a European Research Council Advanced Grant, a Royal Society Wolfson Research Merit Award, and a John Templeton Foundation grant.

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novel perspective is the Extended Evolutionary Synthesis, or EES (Pigliucci & 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 biology. These resources potentially take many forms. Most obviously, books are of central importance. To be compelling, any such summary requires a detailed review of new findings, explanations for how they support new ways of thinking, but must also address philosophical and historical issues, rebutt counterarguments, and spell out practical implications. Only book-length treatments can achieve this aim. The EES conceptual papers (e.g., Laland et al 2014 *Nature*; Laland et al 2015 *Proc R Soc B*) are very well-cited (>800 and >1000 cites, respectively); however, there is a limit to what can be achieved in the brief format of a scientific article. The “message” is too complex and multifaceted to be effectively transmitted in paper format. While edited volumes and other published books are making an important contribution to this debate (e.g., Jablonka & Lamb, 2005; Pigliucci & Müller, 2010; Noble 2017; Nuno de la Rosa & Müller, 2021), they typically lack the coherence and readability, and/or are pitched at a more technical level, to have a broad impact. Scientific books that are comprehensible to a wider audience are now required, as are tools for their promotion.



Mridula Mary PAUL

(October – November 2023)



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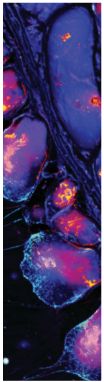
Mridula Mary Paul is a Postgraduate Researcher at the Department of Geography and Environmental Sciences, Northumbria University, Newcastle-upon-Tyne, UK. Her ongoing PhD research looks at the cultural politics and political ecology of zoonoses, with a focus on One Health and India. Prior to this, Mridula practised law before the High Court of Madras and worked as a Senior Policy Analyst with the Ashoka Trust for Research on Ecology and the Environment in India. Mridula is a member of IUCN's Sustainable Use and Livelihoods Specialist Group, and is the editor of Courting the Environment, a newsletter that aims to convey environmental and ecological research to lawyers. She has a degree in Development Studies from the University of Oxford.

What Lurks in the Gaps between Conservation Research and Policy in India

In recent years, conservation researchers have arrived at the conclusion that evidence is only part of the story. Although the concept of policy impact comes with its own baggage, there is recognition that for conservation research to translate to practice, it needs to engage better with policy. The problem is that no one really knows how to do this, given that it requires navigating varied aims, mandates, values, and decisions of a range of actors at various scales.

Building on research that commenced in 1986, government research institutions, ecologists, and wildlife managers from various Indian states came to a consensus at a workshop in 1993 that to counter the risk of extinction, some individuals of the critically endangered Asiatic lion needed to be translocated from Gir National Park, Gujarat to Kuno Wildlife Sanctuary in Madhya Pradesh. There was no doubt in the minds of scientists that this was a conservation priority, and the National Board for Wildlife issued a unanimous recommendation for translocation. Madhya Pradesh spent USD 40 million and displaced





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1500 families to make room for the lions in Kuno. The lions however, never turned up.

Resorting to a sequence of invented bureaucratic hurdles and political obstruction that called on party allegiances in Madhya Pradesh, against a conservation policy formulated by an opposing political party at the Centre, Gujarat was able to stall and eventually obliterate all references to translocation as a conservation tool for the Asiatic lion. The evidence built over years of study tied itself up in expert reports and recommendations. Even an order of the Supreme Court of India on the grounds of “species best interest standard”, that pointed out that Gujarat could not “claim ownership” over the Asiatic lion could not get the state government to budge.

At the heart of conservation policy lies values and decisions based on those values. Scientific evidence is only a small part of this process. In the Kuno case, both science and law were laid down at the altar of cultural pride and parochialism. Officials from Gujarat consistently rebuffed attempts at translocation by citing its cultural history of conservation and proven track record, to ensure that it remained the world's only home for the Asiatic lion. Cultural pride as a value so clearly eclipsed scientific evidence that even the death of 26 lions in the Greater Gir area on account of canine distemper has not proved enough impetus to reconsider the translocation policy. With the political leadership in Gujarat getting elected to the national stage, it would seem that, irrespective of widely accepted views that point to a calamity in the offing, the conservation policy around the Asiatic lion is unlikely to change.

Drawing on scholarship on the role of science and values in conservation decision-making, this project aims to understand the production of conservation policies in India. It will attempt to untangle the fuzziness of this process, using the translocation of wild animals as the domain of analysis, and explore the factors that impact the co-option or discounting of research in the course of conservation policymaking in India.





Hans-Jörg RHEINBERGER

(June 2023)



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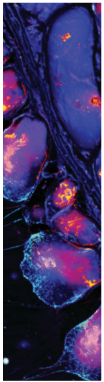
Hans-Jörg Rheinberger studied philosophy and biology in Tübingen and Berlin, Germany. He received his MA in philosophy in 1973, his PhD in biology in 1982, and his habilitation in molecular biology in 1987. He was Assistant Professor at the University of Lübeck, Germany, and Associate Professor at the University of Salzburg, Austria. Since 1997, he has been a Scientific Member of the Max Planck Society and Director at the Max Planck Institute for the History of Science in Berlin.

Hans-Jörg Rheinberger has been a fellow of the Institute for Advanced Study in Berlin and of the Collegium Helveticum in Zürich. He is honorary professor at the Institute for Philosophy and History of Science of the Technical University Berlin, a member of the Berlin-Brandenburg Academy of the Sciences, a member of the Leopoldina, the German Academy of Natural Scientists, and a doctor honoris causa at the Swiss Federal Institute of Technology in Zurich.

The History and Epistemology of Experimentation

The main focus of Hans-Jörg Rheinberger's research lies in the history and epistemology of experimentation in the life sciences. By bridging the gap between the study of history and contemporary cutting-edge sciences, such as molecular biology, his work represents an example of transdisciplinarity as emerging in the present knowledge-based society.





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Federica RUSSO

(January 2023)

Federica Russo is a philosopher of science, technology, and information. She is Honorary Professor at University College London (Department of Science and Technology Studies), and lectures at the University of Amsterdam (Department of Philosophy and Institute for Interdisciplinary Studies). At the UvA, Federica carries out research at the Institute for Logic, Language and Computation, and within the Language and Cognition in Argumentation Group.

Her research concerns epistemological, methodological, and normative aspects they arise in the health and social sciences, with special attention to policy contexts and to the highly technologized character of these fields.

*Federica has published extensively on various themes, such as causation and causal modelling, evidence, and technology, and her latest monograph is titled *Techno-Scientific Practices: An Informational Approach* (RLI, 2022).*

*Federica has been co-editor in chief (with Phyllis Illari) of the *European Journal for Philosophy of Science* and an executive Editor of *Philosophy and Technology*, while she is currently Editor-in-Chief of *Digital Society*.*

*Federica sits in the Management Team of the Institute for Advanced Study at the University of Amsterdam, and is member of the Steering Committee of the *European Philosophy of Science Association*.*

Towards a Philosophy of Techno-Science

As heir of Greek thinking, we are used to separate science from technology, episteme from techne, philosophy of science from philosophy of technology. A closer look at the practice of science, however, shows that technologies are more than mediating instruments — they are part and parcel of the process of knowledge production. In this project, I shall present the main line of argument of my latest monograph



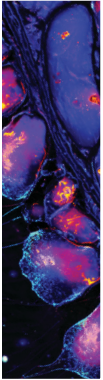
Techno-Scientific Practices. An Informational Approach (RLI, 2022). I reconstruct how the gap between (Phil) Tech and (Phil) Sci came about and suggest that neglected traditions such as French Epistemology and current approaches such as the Philosophy of Science in Practice can bridge the gap. In particular, turning our attention to techno-scientific practices, I shall argue, helps us recognise the ways in which we human epistemic agents produce knowledge together with artificial epistemic agents. I sketch the contours of an epistemology for techno-scientific practices, one in which classic concepts of 'model', 'evidence', 'truth', and 'knowledge' need to be redesigned. I cash out the idea of knowledge co-production with the concept of poiêsis, and anticipate some of the challenges ahead, notably about ontological and normative questions.

Alfred RÜTTEN

(July 2023)

Alfred Rütten is senior professor at Friedrich-Alexander University Erlangen-Nuremberg (FAU), Germany. Previously, he served as FAU director of the Institute of Sport Science and Sport and as head of the Division of Public Health and Physical Activity. From 2014-2018, he has also been director of the first WHO Collaborating Centre on Physical Activity and Public Health in Europe. He received his PhD in political science, sociology and sport science from RWTH Aachen and his habilitation in sport science from the University of Stuttgart. He then served as research professor of sociology (UAB, USA), as professor of sport science and applied sociology (Chemnitz Technical University), and as visiting professor of public health (Yale University). In 2013 he received an honorary doctorate from the Lithuanian Sports University. From 2014 to 2015 he was visiting professor of public health at Stanford Prevention Research Center (Stanford University).





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Rütten has led several cross-national research and development projects on behalf of the European Commission and WHO. For example, he was contracted by the EC to coordinate a study on the implementation of the EU Physical Activity Guidelines and an international network to implement these guidelines in the area of infrastructure development. In 2015, he and his team conducted several reviews supporting the development of the WHO Physical Activity Strategy for the European Region and the German National Recommendations for Physical Activity. From 2014-2018, he has been the coordinator of a BMBF-funded research network on capabilities for active lifestyle and interactive knowledge-to-action – Capital4Health.

At the European level, he was one of the experts that developed the “European Physical Activity Guidelines” (2008), and has been involved in an EU initiative to foster the implementation of the Guidelines since 2013. He has served as a temporary advisor of WHO in various contexts (e.g. monitoring of physical activity, social inequality). Since 2014, he has been a leading scientific consultant for the development and implementation of the WHO European Physical Activity Strategy. On behalf of WHO, he supported national governments in implementing such strategies at the national level.

At the national level, he coordinated the development of National Recommendations for physical activity and its promotion on behalf of German Federal Ministry of Health. He also served as consultant for various other national and regional bodies. Since 2016, he led several projects on the implementation of the German prevention law and the national PA recommendations. Most recently, he coordinated several demonstration projects on the implementation of PA recommendations in Germany and since 2021 he is director of a scaling-up project including a larger sample of communities.

His recent international publications include review articles, e.g., a “scoping review on three types of evidence to inform physical activity policy” (JPAH 2016). papers on transdisciplinary research (e.g. “co-producing active life-



styles”, HPI 2017), on implementation of PA guidelines (“How can the impact of national recommendations for physical activity be increased?”, Health Res. Policy Syst. 2018) and on researchers as policy entrepreneurs (Global Handbook of Health Promotion Research, 2022).

Transdisciplinary Research and Its Scientific Impact: Insights and Implications from Health Research and Sustainability Research on Interconnected Health-Environmental Challenges, Collaborative Approaches, and Structural Development in Science

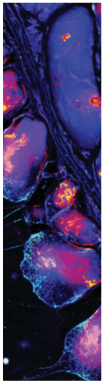
Alfred will be working on the Project “Transdisciplinary Research and its Scientific Impact” supported by the tdAcademy. The project aims on advancing the study of the interface between sustainability research and health research in participatory and collaborative research, which has been little researched 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 researchy.

Jana SEMRAU

(November – December 2023)

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





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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.

Transdisciplinary Research and Its Scientific Impact: 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.



Sonia E. SULTAN

(January – April 2023)

Sonia E. Sultan is a plant evolutionary ecologist. Her research group studies ecological development or ‘eco-devo’: how individual plants develop and function differently in response to different environmental conditions, in particular to factors that vary in nature such as light and shade, soil moisture, and key nutrients. To examine these responses, Sultan determines response patterns or norms of reaction for genetic individuals collected from field populations. These experiments reveal

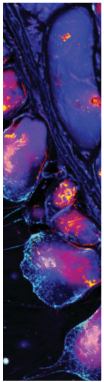


*the interplay of genotypic and environmental factors in shaping the functional and reproductive outcomes of individual development. Sultan has long been a major contributor to the empirical and conceptual literatures on individual plasticity and its relation to ecological breadth and adaptive evolution. In Fall 2015, she published many of these ideas in a book entitled *Organism and Environment: Ecological Development, Niche Construction and Adaptation* (Oxford University Press). Sultan's current experimental work focuses on three questions: (1) inherited effects on development due to parent environment; (2) the relation of individual plasticity to invasiveness; and (3) the role of DNA methylation as a regulatory mechanism for environmental response. Sultan graduated *summa cum laude* in History and Philosophy of Science at Princeton University and then traveled the world for two years before going on to graduate work in Organismic and Evolutionary Biology at Harvard. As a graduate student, Sultan developed her interdisciplinary approach to developmental plasticity, working with plant ecologist Fakhri A. Bazzaz and population geneticist Richard Lewontin, and publishing an influential review paper in *Evolutionary Biology*. After completing her PhD, she was awarded an independent CPB Post-Doctoral Fellowship at the University of California's (Davis) Center for Population Biology and spent three years there before joining the Biology Department at Wesleyan in late 1993. Sultan has been a guest researcher at the University of Otago and the Liggins Institute in New Zealand and was a 2012-2013 Resident Fellow of the Berlin Institute for Advanced Study (Wissenschaftskolleg zu Berlin).*

Updating the Single Evolutionary Currency

My project at the KLI will build on and expand my previous work on the environmental response capacities of organisms by addressing a central conceptual problem: resolving the role of genetic variation in adaptive evolution from an eco-evo-devo perspective. Although evolutionary biologists increasingly





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accept this updated perspective with regard to phenotypic variation, the field adheres to a gene-based model of evolutionary change. This explanatory disconnection has led to a scientific impasse, reflected in a current divide between researchers who emphasize eco-evo-devo approaches and those who view these ideas as inadmissible departures from the accepted evolutionary framework. To move forward and fully integrate development into evolutionary theory requires resolving this conceptual incongruity. Clarifying the relation of gene variants to complex phenotypes has broad resonance beyond evolutionary biology as well, from ideas about human diversity to funding priorities for medical research.



Maria VIOTA

(June – July 2023)

Maria Viota is a biologist (UPV / EHU) with postgraduate education in Conservation Biology (Diploma of Advanced Studies, University of Seville) and Environment and Sustainability (Master's Degree, UPV / EHU). Her interests are oriented on the one hand, to research in Ecology and Conservation as scientific disciplines contributing to Sustainability Sciences that can provide answers to ecological and social problems, and on the other hand, to the possibilities from Education as a key approach for the transformation towards more sustainable and just societies. As a result, at present her interests are in the field of sustainability sciences and emerge from the intersection of ecology, biology and environmental sciences. She holds experience in environmental consultancy, research in terrestrial ecology and education for sustainability. She is currently an independent PhD Candidate in collaboration with the UNESCO Chair on Sustainable Development and Environmental Education of the UPV / EHU examining the contribution of green spaces to the sustainable well-being.



Integrating Ecosystem Services and Health to Promote Sustainable Planning and Well-Being in a University Campus

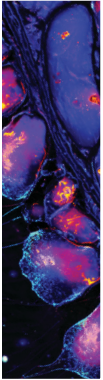
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The presence, access, quality, and distribution of green spaces result into health outcomes such as life expectancy, reduction in mortality and morbidity, improvement of mental health; and psychological restoration as medicine, education, urban planning, philosophy and ecology highlight and provide evidence. Moreover, the presence of green spaces in work and educational environments is related to better learning and cognitive development, the generation of scientific knowledge, environmental education and ecological awareness, improvement of social interaction cohesion and collective well-being. University campuses are the ideal places to test both sustainability opportunities and education challenges and make them a communal experience to study and promote sustainable well-being. This project addresses the relationship between health, well-being and green spaces from an interdisciplinary perspective. Together with the KLI fellow Laura Menatti, and Ibone Ametzaga-Arregi, I have designed a mixed method study to evaluate the perception of green spaces in the 4 Campuses of the University of the Basque Country to analyze the well-being outcomes and the ecological aspects (ecosystem services).

This proposal is relevant as it is situated in the intersection of ecology, philosophy and sustainability sciences, by following an interdisciplinary methodology both which integrates qualitative and quantitative analysis. It is conceived at a local scale and has a clear societal relevance to redound positively in the university community. The results of the study will be published in an international peer-review journal, they will be discussed with the University office responsible for sustainability measures at the University of the Basque Country. The data collected will be translated into guidelines and advices and integrated into sustainability design decisions.

The study is in the pilot phase, and the related results and the explanation proposed are aimed at bridging the gap between ecological science and humanities in analyzing greens spaces and ecosystem services in a University Campus. It





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relies on quantitative and qualitative methods and it is based on an online survey for the whole University community and designed considering the literature and the contemporary accounts in environmental philosophy, environmental psychology and ecology.

This project is the third chapter of my PhD dissertation and it will be finalized in a paper to be written with the KLI fellow Laura Menatti and submitted by October 2023. My visiting at KLI is also aimed at widening the theoretical framework to sustain the introduction and the conclusion of my dissertation. I plan to accomplish the preliminary data-analyses during my visit at KLI and to discuss them with Laura Menatti. I will also have the possibility to widen my knowledge in sustainability sciences, philosophy of science and biology by attending seminars and reading groups at KLI and interact with the KLI fellows, which definitely enrich the main output planned while at the KLI is to advance in the writing of the chapter of my dissertation dedicated to this project and also to acquire a theoretical framework for Introduction and Discussion of my thesis).



2.6 Researchers with Own Funding

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Leonardo BICH

(November 2022 – April 2023)

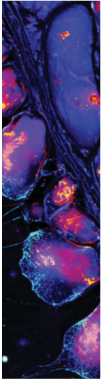


Leonardo Bich is an Associate Research Professor at the IAS-Research Centre of the University of the Basque Country (Spain). He obtained a PhD in Epistemology of Complex Systems from the University of Bergamo (Italy). He worked at the CNRS (France), at the Biology of Cognition Lab of the Universidad de Chile, at the Center for Philosophy of Science of the University of Pittsburgh, and as a 'Ramon y Cajal' Researcher at the IAS-Research Centre of the University of the Basque Country. His research is focused on theoretical and epistemological issues related to biological organisation, autonomy, and control and on their implications for investigations in Origins of Life, Synthetic and Systems Biology, and Theoretical Biology.

Biological Individuality: A Theoretical Framework Based on Physiological Control

The debate on biological individuality has usually been focused on the definition and characterization of evolutionary individuals. Addressing this topic has helped clarify the discussion about units of selection and the requirements for evolution by natural selection. Less attention has been paid to other kinds of individuality (i.e. non-evolutionary based accounts), among which the main alternative to evolution to ground biological individuality has been constituted by organismal physiology. Non-evolutionary accounts of biological individuality are still underdeveloped in comparison to evolutionary ones. This is especially evident in relation to interactive cases (i.e. host-microbe symbioses, microbe-microbe symbioses (biofilms), colonies) that transcend the "traditional organism."





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On the one hand the very notion of organism has been challenged by cases of cohesive entities emerging from interactions. Recent research on host-microbiota and, more generally, symbiotic relationships characterized by close functional ties, for example, might seem either to question the possibility to establish clear functional boundaries for living organisms, or to call for further work of characterization of the different ways functional interactions can be established within a system or between systems. On the other hand, where generalization has been attempted, criteria involved in physiology, metabolism, organisms, anatomy, and ecology all tend to get bundled up together with very few distinctions to be made about why they go together.

The need for precise accounts based on conceptual or theoretical criteria is therefore especially apparent given new understandings of a wide range of interactive biological entities, from different types of multicellular systems to host-microbe interactions. The possibilities of forms of biological individuals arising out of interactions and new ways to identify and account for non-evolutionary individuals will be explored by focusing on physiology from an organizational perspective (or biological autonomy framework). At the same time this work will address the challenges represented by research on interacting entities, which seems to question the application of very notions of autonomy and individuality in biology.

To develop this framework on individuality, I will lean on previous work on control mechanisms, considered as those components of biological systems that are responsible for coordinating, modulating, activating and inhibiting the activities of other components in such a way as to maintain the overall viability of the biological system that harbours them. This is a step forward with respect to previous developments the organizational account, mainly focused on how a living system maintains itself by producing its parts. This approach will be applied to two case-studies: multicellular organizations and holobionts (in collaboration with Derek Skillings, UNCG).



Joyshree CHANAM

(November 2022 – September 2024)



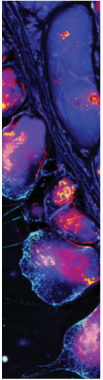
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Joyshree Chanam is trained in the ecology and evolution of plant-insect interactions. She holds a Master's degree from the University of Delhi and a PhD from the Indian Institute of Science, Bangalore, India. During her PhD, she investigated dynamics 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 in 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.





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Dean FALK

(August – September 2023)

*Dean Falk is the Hale G. Smith Professor of Anthropology and a Distinguished Research Professor at Florida State University in Tallahassee, where she teaches and does research. Having trained as a physical anthropologist, Falk is interested in the evolution of the brain and the emergence of human cognitive abilities that led to language, music, analytical thinking, and warfare. She has directed collaborative research on the brains (or traces of them imprinted in fossilized skulls) of nonhuman primates, prehistoric human relatives, and recent humans including *Homo floresiensis* (aka “Hobbit”) and Albert Einstein. In addition to numerous scientific and popular articles, Falk has written books including *Braindance: Revised and Expanded Edition* (2004), *Finding Our Tongues: Mothers, Infants, and the Origins of Language* (2009), *The Fossil Chronicles: How Two Controversial Discoveries Changed Our View of Human Evolution* (2011), and *Geeks, Genes, and the Evolution of Asperger Syndrome* (2018), which is coauthored with her “Aspie” granddaughter, Eve Penelope Schofield. Falk is currently writing a book titled *The Botanic Age* (University of Toronto Press, forthcoming).*

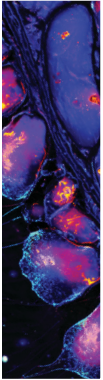
Letters from the Round Table: New Light on Hans Asperger and the Development of Pediatrics in Vienna

The Therapeutic Pedagogy Unit (TPU) of the University of Vienna’s Children’s Hospital that was directed by Hans Asperger (discoverer of Asperger Syndrome) during the Nazi occupation of Austria has recently been in the academic and public spotlight because of sensationalistic claims that Asperger was complicit in the Nazi Child Euthanasia program. Although my colleagues and I have begun to publish responses to this allegation, the controversy about Asperger and what went on at his ward is becoming more heated. Unfortunately, there is a significant lack of evidence that addresses the



specifics of Asperger's ward, the people who ran it, their attitudes toward their patients, and how they regarded their boss. The proposed project will address this gap by publishing a collection of private letters written to Asperger between 1933 and 1949 by members of his inner circle at the TPU who referred to themselves as the Round Table (Tafelrunde): Valerie Bruck, Josef Feldner, Georg Frankl, Anni Weiss, and Viktorine Zak. The letters were provided to us from Asperger's estate, which is curated by his daughter Dr. Maria Asperger Felder. They discuss the ward's patients, goings-on at the clinic, and the personal and professional lives of Asperger and his colleagues. The proposed project is to translate into English and publish these letters in a volume, titled Letters from the Round Table. The volume will be coauthored by an interdisciplinary team of five scholars (three of them from Austria) and will consist of approximately thirty items, most of them letters. Each item will be annotated to shed light on its context and/or further relevant historical background. Photocopies of the original communications, written in German, will be presented along with their English translations and explanatory information. However, the volume will offer more than a set of translated letters that have relevance for assessing the current controversy about Asperger. Medical Therapeutic Pedagogy predated the advent of child psychiatry and developed from pediatrics in Vienna in the early 20th century to meet the needs of children with emotional, behavioral, and educational difficulties. For the care of such children, psychoanalytical and psychological testing approaches were considered irrelevant. At the same time, the Child Guidance Movement, which included the latter approaches, developed in the USA. Tensions between the European and American schools are reflected at a very personal level in some of the volume's letters. This wealth of information should be of interest, not only to historians of psychology, but also to child psychiatrists and other pedagogic practitioners. In sum, the volume will be relevant for scholars interested in the history of medicine in Vienna in addition to historians and members of the public who want to understand how Asperger and his colleagues treated disabled children before and during the Nazi occupation of Vienna.





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Lauren LAMBERT

(April – December 2023)

Motivated by the desire to transcend political aporia — in which communities feel they must choose between two bad choices — with creative solutions being the biggest driving force in her work and life. At ASU Lauren seeks to design research at the intersection of environmental policy and nature / society studies, to investigate how political decision-making takes place across different scales within complex global systems in support of social-ecological thriving in urban environments. To better understand the socio-economic factors underlying resilience, she investigates how people’s capacity to envision their available responses to climate change affects institutional decision-making in urban policy and planning. Current focus includes game theory, decision making, natural resource economics and complex adaptive system science. Lauren is an avid yogi and hiker with a love for travel and dark roast coffee

Cultivating Coherence in Sustainability: Social, Futures, and Ecological Empathy

My work at KLI will constitute a final synthesis across the three studies of my dissertation. From the perspective constructionism, I will articulate the significance of cognitive bias in limiting coherence across social groups, time, and species. I will situate practice (Ortner 1984; Bourdieu 1977) and imagination at the theoretical core of my work on enabling human collaborative potential (Anderson 1991; Harari 2014). Then, I will articulate how cognitive biases limit imaginative potential and connection across difference in decision making environments in ways that stifle collaboration for sustainability. Expanding from the history of the concept of empathy (Wispé 1987), which was born among the aesthetics, I will move from the historical and evolutionary perspective of intra-group empathy (Waal 2009) toward a perspective of inter-group social (E. A.



Segal 2011), inter-generational futures and inter-species ecological empathy. In making this move, my synthesis work at KLI will retheorize empathy as foundational to circumventing cognitive bias and increasing coherence between people, time horizons, and species, in the Anthropocene.

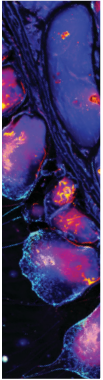
Luis Alejandro VILLANUEVA HERNÁNDEZ

(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 has previously received a KLI writing-up fellowship to complete his PhD thesis. 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.





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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 which individuals acquire a repertoire of musical 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.



2.7 Artist in Residence

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Kendall BAKER

(January – April 2023)



Kendall Baker is an artist working in site-specific installation sculpture, mixed-media sculpture and photography. His site-specific work engages perceptual responses to natural environments; his hybrid sculpture / photography transposes the graphic rendering of natural subjects into the dimensionality of sculptural forms. Baker received his M.F.A. in Sculpture from the Yale School of Art and his B.F.A. from Clark University. He spent a year in India as a Fulbright Scholar, making sculpture and studying cave-temple architecture. His artwork has been shown at I-Park Sculpture grounds, the Institute for Advanced Study in Berlin (WIKO), The Sculpture Center (New York), the Althea Viafora Gallery (New York), the Snug Harbor Cultural Center (New York), the USIS Cultural Center (New Delhi) and MS University in Baroda, India, among other venues.

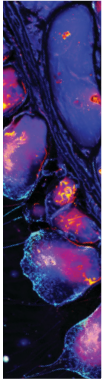
Measuring Life At The Threshold Of Unknowing

Artists, like scientists and other scholars, seek to gain insight to the natural world through differently mediated types of observation and measurement. A scientist's measurements of the world involve quantifying relationships for specified objects; the painter measures the world using color and shape; a philosopher's measurement tools are words and concepts. These mediating approaches take these investigations to the threshold between direct knowledge and what remains to be seen, named and measured — to a place of unknowing. For both scientists and artists, it is in this space that creative work takes place and questions are posed outside of existing, known measurements of the world.





activities of the KLI 2023



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Measurement is valuable. Done with care and precision it reveals extraordinary relationships. In our attempts to make measurements of these relationships each effort illuminates the threshold between knowing and unknowing. My focus is on this threshold. How do we use what we know to measure what we don't? I propose to develop a cross-disciplinary art-science project through conversations with the resident KLI Fellows that explore their various ways of engaging with the space of unknowing. My interest is in learning about and gaining some insight into the many ways in which the Fellows have come to first encounter this territory in their own creative development, and how as professional investigators they have come to recognize and contend with the space between knowing and unknowing. Whether as scientists, scholars, or artists, this zone of inquiry, unlimned and beyond the reach of metrics, free of name and form, is an intimate partner. Its vast and inchoate presence draws our attention and curiosity as we work to push forward our understanding of the world.





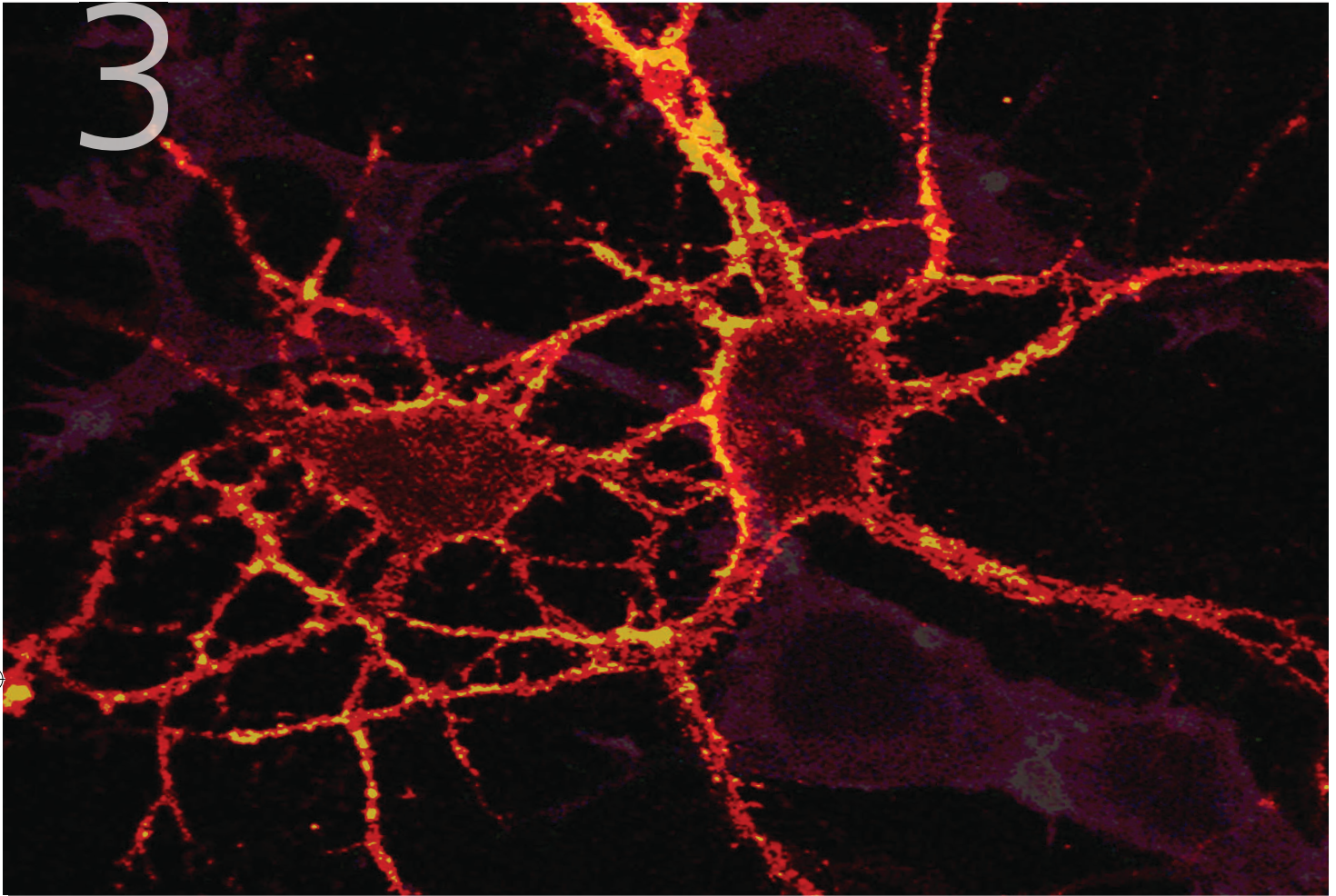
Scientific Projects

61





Meetings and Lectures

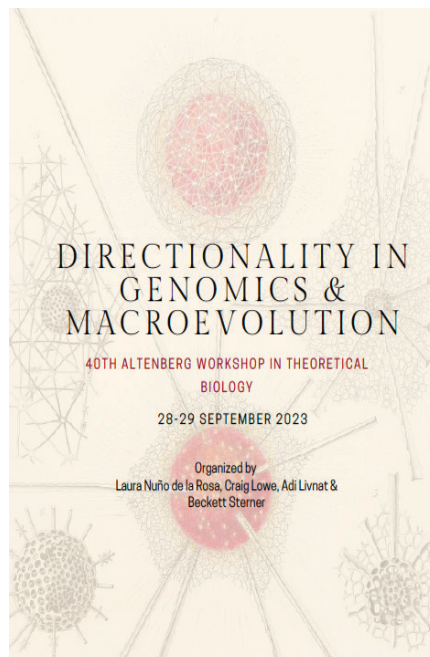


The KLI supports international workshops, symposia, and individual talks that are organized by the KLI or in cooperation with other institutions.



3.1 Altenberg Workshop 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.'



40th Altenberg Workshop in Theoretical Biology 28 – 29 September 2023

Directionality in Genomics and Macroevolution

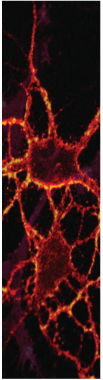
KLI, Klosterneuburg

Organization: Laura Nuño de la Rosa (Complutense University of Madrid), Craig Lowe (Duke University), Adi Livnat (University of Haifa), and Beckett Sterner (Arizona State University)

Topic and Aims

Detecting biases in biological patterns and processes is central to life science inquiry. However, since unambiguous signatures of directionality are often elusive, it is also a source of methodological frustration. Increasingly sophisticated experimental and theoretical tools have been utilized in the areas of genomics, phylogenetics, and evolutionary paleobiology. Nevertheless, new statistical models and model systems are required to isolate signals from noise in large data sets.

Concerted efforts by multidisciplinary teams working on the details of mutational processes, genomic signatures, and macroevolutionary trends help to orient future research with robust procedures that identify directionality in lineages, thereby advancing our understanding of evolutionary dynamics within and across populations and lineages.



64 The workshop on Directionality in Genomics and Macroevolution will bring together 16 researchers for three days. These researchers are working on the development of new conceptual and methodological approaches to the detection and explanation of evolutionary trends. 11 of the participants are part of the three research groups of the Cluster “Directionality in Genomics and Macroevolution,” one of the seven thematic clusters articulated in the cohort program “Agency, Directionality, and Function,” funded by the John Templeton Foundation. The other participants will be external collaborators of the project who act as scientific advisors to the Cluster.

The aim of the workshop is to discuss the results achieved in each project within a shared theoretical framework, address transversal conceptual issues linking our cluster to other clusters of the cohort program, and explore future collaborations among members of the cluster, other participants of the cohort program, and external collaborators.

Participants

JEVGENI BOLOTIN

University of Haifa, Israel

ANTONIO CAMPBELL

Arizona State University, Tempe, USA

CHRISTIANA FAUCI

Duke University, Durham, USA

JOHN FRICKS

Arizona State University, Tempe, USA

DORIT FINK-BARKAI

University of Haifa, Israel

MELANIE HOPKINS

American Museum of Natural History, New York, USA

GENE HUNT

Smithsonian National Museum of Natural History, Washington D.C., USA



ADI LIVNAT
University of Haifa, Israel

CRAIG LOWE
Duke University, Durham, USA

RILEY MANGAN
Duke University, Durham, USA

JOHN MATTICK
The University of New South Wales Sydney, Australia

DANIEL MELAMED
University of Haifa, Israel

GERD MÜLLER
Konrad Lorenz Institute for Evolution and Cognition Reserach,
Klosterneuburg, Austria

LAURA NUÑO DE LA ROSA
Complutense University of Madrid, Spain

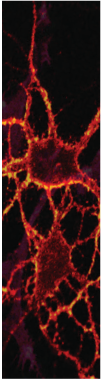
BECKETT STERNER
Arizona State University, Tempe, USA

GUNTER WAGNER
Yale University, New Haven, USA

3.2 KLI Working Group

The KLI supports international groups of scholars in the life and sustainability sciences working on interdisciplinary projects to conduct their groundbreaking research at the institute. KLI Working Groups aim to develop ideas on a particular subject and generate suggestions for action. The participants have different scientific backgrounds and strive to develop specific, practical goals. Working Groups comprise 3 meetings over the course of one year and a half.





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Working Group
17 – 21 April 2023

**Evolutionary Theories for
Social-Ecological Change**

KLI, Klosterneuburg

Organization: Tim Waring & Maja Schlüter

Participants: Tim Waring, Peter Sogaard Jorgensen, Maja Schlüter, Monique Borgerhoff Mulder, Guido Caniglia, Jamila Haider

Topic and Aims

Our working group aims to connect the domains of evolutionary theory and social-ecological systems change to improve our collective ability to understand and influence the complex processes of change in social-ecological systems for the better. Our working group has been very successful. The first meeting was a wide ranging exploration of the intellectual and disciplinary challenges of bringing the two domains closer together. The second meeting refined that work and produced a research paper now in revision at *Philosophical Transactions of the Royal Society, B*, which maps the conceptual connections between evolutionary theory and social-ecological systems (SES) change and builds motivation for using evolutionary theory in studying SES change.

Our third and final meeting of the working group will take the next step in integrating evolutionary theory and social-ecological systems change. Specifically, we will develop a small set of follow-on projects focused on more specific applications of evolutionary methods, theory for understanding social-ecological systems change, each to become a separate output. Current work includes a mathematical and simulation model of a classic SES model on poverty traps, rebuilt to include cultural evolution of human behavior. A second emerging project includes a synthetic approach to understanding the evolution of social-ecological systems in a holistic fashion. We are excited to share the outcomes of our working group. We hope they will be of use in both the SES and sustainability sciences and the evolutionary sciences.



3.3 KLI Special Events

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Public Event 21 September 2023

Will the Real Hans Asperger Please Stand Up? Letters from the Round Table

KLI, Klosterneuburg

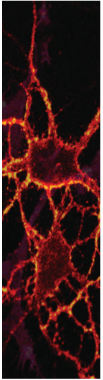
Speaker: Dean Falk (Florida State University, Tallahassee, USA)

Topic

The project was to translate approximately 30 letters (plus additional materials) from German into English for a volume (now) titled *Letters from the Round Table* ("Tafelrunde"): The private correspondence of Hans Asperger before, during, and after World War II. During my stay at KLI, my coauthors in Vienna and I were able to complete nearly all of the translations, and to organize an outline and table of contents for the book. Since then, I have submitted a book proposal to Oxford University Press (OUP), which my coauthors and I subsequently revised and resubmitted in response to six anonymous reviewers. The volume now has seven coauthors Waldhauser*, F., D. Falk*, S. Dluzak, P. Schwarz, E. Tatzler, W. Maleczek, & M. Asperger Felder (* FW & DF are co-first authors; DF is corresponding author). We are hopeful that we will soon have a contract with OUP and anticipate that the volume will be widely distributed to libraries, bookstores, review editors, and individuals.

Meanwhile, there is a lot more work to do on the project. The letters must be annotated and discussed within historical context and (at reviewers' requests) an epilogue written that touches upon the question of who had priority in the discovery of autism, how Asperger syndrome is regarded by contemporary health professionals, and what, if anything, the previously unpublished letters imply about the allegation that Asperger was a Nazi sympathizer. As the corresponding editor, I am responsible for copyediting the entire volume to make sure the English is accurate, consistent, and grammatical, for writing my own part of the analyses, and for seeing the volume through the publication process.





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Vernissage
11 May 2023

**Measuring Life at the Threshold of
Unknowning**

KLI, Klosterneuburg

Artist in Residence: Kendall Baker (Caldwell College, Caldwell, USA)

Topic

The KLI hosted the vernissage of an exhibition by Artist in Residence Kendall Baker. His interdisciplinary art-science project “Measuring Life at the Threshold of Unknowning” sought to gain insight and pose questions about (un)knowing by bringing together both artistic and scientific practices.

The artist explored the space between direct knowledge and the limits of knowing—the threshold of unknowing. For Baker it is this space where questions emerge, inspiring the creative work of artists as well as scientists. Underpinned by this rich conceptual framework, which emphasises the importance of the unknown as a creative moment of knowing, Baker chose shape and measurement as epistemological tools to reveal different kinds of relationships. To explore this threshold, he used the old and new parts of the building as a starting point for interacting with the space.

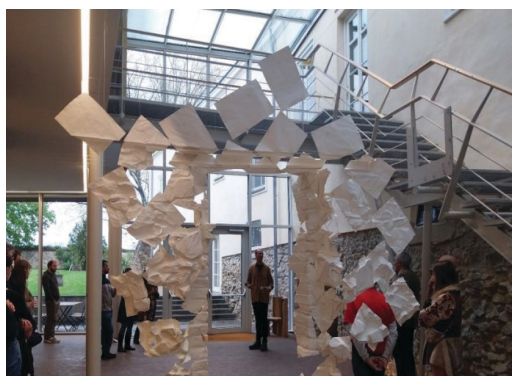
The KLI residence, with its impressive history and architecture, proved to be a nurturing space for his artistic practice. Baker responded to the multivarious thresholds he found in the building’s history, materials, and architecture, as well as the spirit of inquiry and openness at the KLI. He connected these with epistemological thresholds he encountered through measuring and mapping the space. The result was a transformation of the connecting space between historic and new parts of the building by measurement, paper, and object studies.

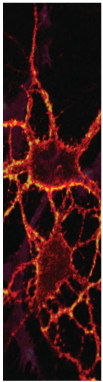
The artist was embedded in the institute over a period of four months which allowed for a special collaboration with the KLI fellows. Baker related his artistic practice to the fellow’s scientific research by conducting interviews with the fellows to learn about their backgrounds, orientations, and what nurtures their creativity in research. The conversations



about how the fellows encounter the territory of unknowing and how they contend with the space between knowing and unknowing developed into a hands-on collaboration in which the fellows were invited by Baker to create certain parts of his site-specific installation. The fellows took part in measuring the doorway that connects the building's 14th-century foundation to the newly build open space. The doorway was covered with sheets of wet paper, that, when dried, retained the shape and contours of the doorway. The result was an intricate three-dimensional paper sculpture suspended from the atrium at the heart of the KLI, a threshold in itself, that emphasises and articulates the open environment of the KLI, bringing the visitors into an awareness of the space.

Baker's thought-provoking exhibition highlighted the importance of interdisciplinary collaboration in pushing forward our understanding of the world and the value of artistic and scientific approaches in mediating observations and measurements. The project was an affirmation of the institute's mission and proved to be an enriching experience for the KLI fellows, both as people and as researchers, that will have a lasting impact.





70 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.

FEDERICA RUSSO

University of Amsterdam, The Netherlands

Towards a Philosophy of Techno-Science

ISABELLA SARTO-JACKSON

Konrad Lorenz Institute for Evolution and Cognition Research, Klosterneuburg, Austria

The Making and Breaking of Minds. How Social Interactions Shape the Human Mind

LUIS ALEJANDRO VILLANUEVA HERNÁNDEZ

Konrad Lorenz Institute for Evolution and Cognition Research, Klosterneuburg, Austria

Social Interaction and Material Culture in the Transmission of Music: An Evo-Devo Approach

SONIA E. SULTAN

Wesleyan University, Middletown, USA

Unscripted Plant Development: Adventures in the Interaction Space

WORKING GROUP PRESENTATION

Konrad Lorenz Institute for Evolution and Cognition Research, Klosterneuburg, Austria

Evolutionary Theories for Social-Ecological Change

LEONARDO BICH

University of the Basque Country, Spain

Making a Whole Biont: An Organizational Account of Physiological Individuality

GILLIAN BROWN

University of St. Andrews, Scotland, UK

The Evolution of 'Universal' Human Mating Strategies: A Critique



BENEDIKT HALLGRIMSSON

University of Calgary, Canada

The Conceptual Foundations of Evolution and Development

TUDOR M. BAETU

Université du Québec à Trois-Rivières, Canada

Extrapolating Animal Consciousness

AASHIMA DOGRA

Independent Science Communicator

Challenges towards a Truly Inclusive Research Culture: Realisations from a Feminist Science Media Project in India

MARCO TREVEN

Medical University of Vienna, Austria

Searching for the Boundaries of Brain Circuit Disorders

MARKUS F. PESCHL

University of Vienna, Austria

Socio-Epistemic and Material Pathways to Novelty and Innovation

ALFRED RÜTTEN

Friedrich-Alexander University Erlangen-Nuremberg (FAU), Germany

Structure, Collective Action, and Gestaltung: The Science and Art of Transdisciplinarity and Its Scientific Impact

MARIANNE PENKER

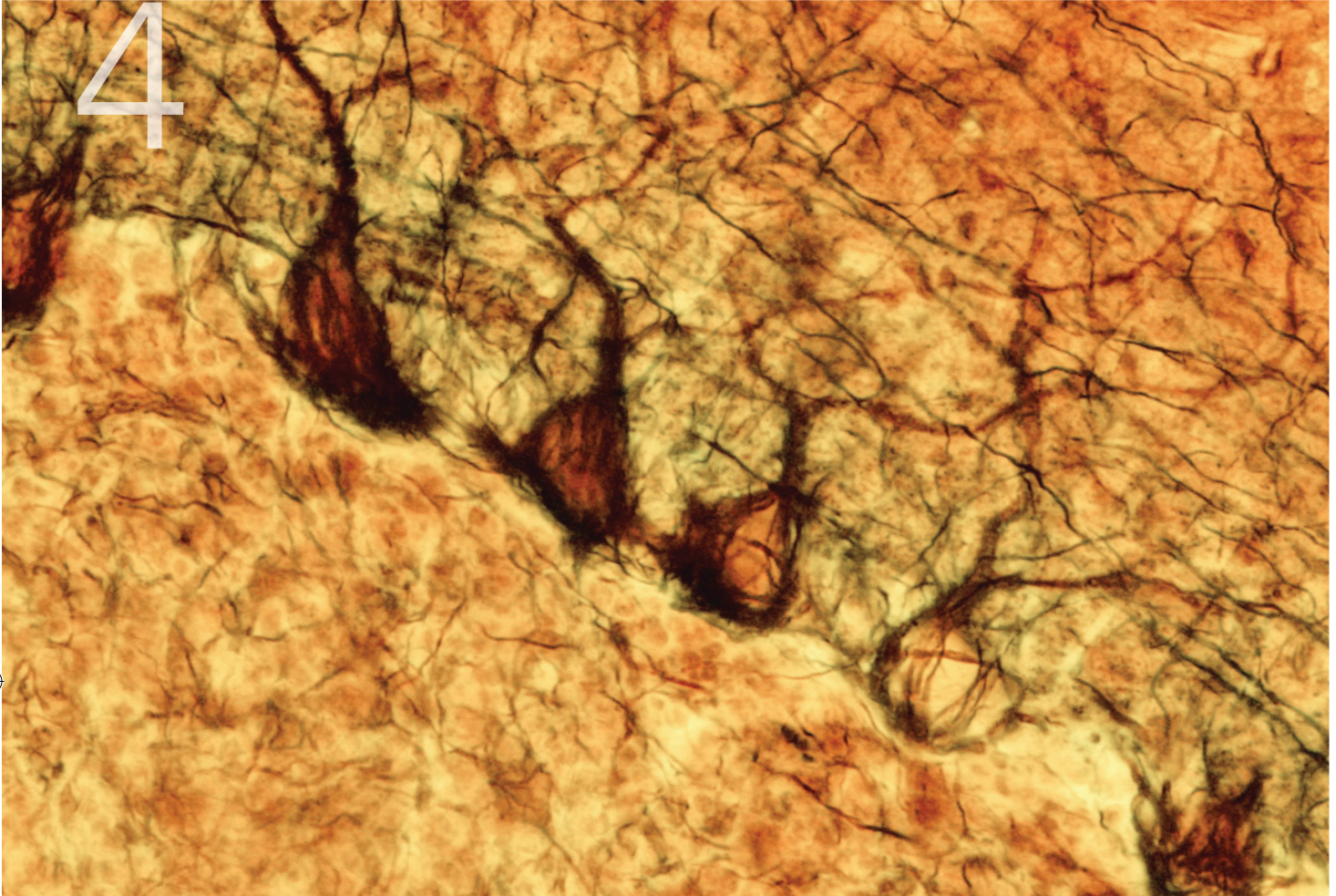
University of Natural Resources and Life Sciences, Vienna, Austria

Knowledge Production in Times of Crises: Transdisciplinary Research in Austria





Publications



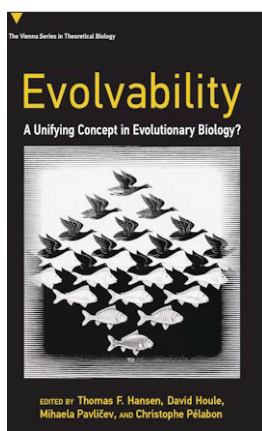
Scientific publications and presentations of KLI fellows and staff in 2023.





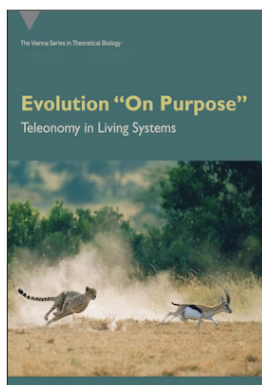
4.1 Vienna Series in Theoretical Biology

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.



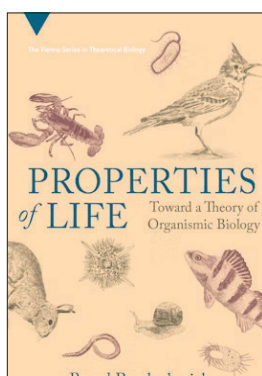
Volume 32:

THOMAS F. HANSEN, DAVID HOULE,
MIHAELA PAVLICEV, CHRISTOPHE PÉLABON
Evolvability



Volume 33:

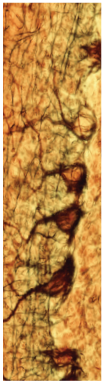
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DENIS NOBLE, JAMES A. SHAPIRO, RICHARD
I. VANE-WRIGHT, ADDY PROSS
Evolution "On Purpose"



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BERND ROSSLENBROICH
Properties of Life





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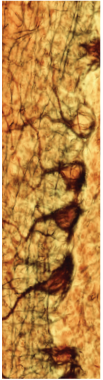
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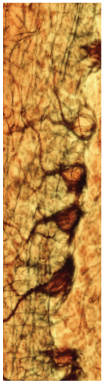
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[Fisher’s Knowledge and the Closed Fishing Season: Filling a Needed Gap]

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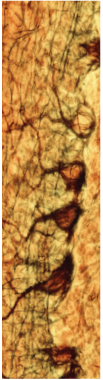
SRIDHAR H.

All Nature is Political: An Interview with Bill Adams

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80 SRIDHAR H.

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Complexity Literacy for a Sustainable Digital Transition: Cases and Arguments from Transdisciplinary Education Programs

In: Digitalization, New Media, and Education for Sustainable Development: Global and National Perspectives and Actions (Keller L, Michelsen G, Duer M, Bachri S, Zint M, eds.), pp. 56-75

IGI Global: Hershey

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PhD Thesis, Leuphana University, Lüneburg

SZILÁGY A, CZÁRÁN T, SANTOS M, SZATHMARY E.

Directional Selection Coupled with Kin Selection Favors the Establishment of Senescence

BMC Biology 21: 230

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Are Neurodegenerative Disorders Causing Characteristic Changes in Visual Artwork?

Commentary on 'Can We Really "Read" Art to See the Changing Brain?'

by Pelowski M, Spee BTM, Arato J, Dörflinger F, Ishizu T, Richard A.

Physics of Life Reviews 44: 102-104



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In: Dictionary of Ecological Economics (Haddad B, Solomon B, eds), pp. 126-127
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VIANNA FRANCO MP.

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VILLEGAS C.

Book review on "Uncertainty. How it Makes Science Advance." New York: Oxford University Press by Kampourakis K, McCain K. (2020)

Daimon Revista Internacional de Filosofía 89: 225-228

VILLEGAS C, LOVE A, NUÑO DE LA ROSA GARCÍA L, BRIGANDT I,
WAGNER GP.

Conceptual Roles of Evolvability across Evolutionary Biology: Between Diversity and Unification

In: Evolvability (Hansen T, Houle D, Pavlicev M, Pélabon C, eds), pp. 35-54
The Vienna Series in Theoretical Biology, MIT Press: Cambridge

VILLEGAS C, TRIVIÑO V.

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ArtefaCToS

Journal of Science and Technology Studies 12: 79-102

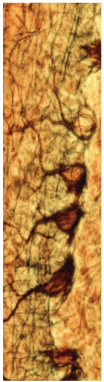
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Las zonas verdes del Campus de Leioa (UPV/EHU): una oportunidad para la educación en sostenibilidad y el diseño conjunto de un campus más saludable

In: Innovación educativa en Educación Superior (Urrutia, A.; Idoiaga, N.; Gezuraga, M., et al., eds), pp. 182-188

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82 WADE MJ, SULTAN SE.

**Niche Construction and the Environmental Term of the Price Equation:
How Natural Selection Changes when Organisms Alter Their
Environments**

Evolution & Development 25: 451-469

WEITZER J, BIRMANN BM, STEFFELBAUER I, BERTAU B, ZENK L, CANIGLIA G,
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**Determinants of Trust in Times of Crises: A Cross-Sectional Study of 3,065
German-speaking Adults from the D-A-CH Region**

PLoS ONE 18: e0286488

WHITE S, MENÉNDEZ LP.

Biosocial Complexity and the Skull

In: Behaviour in our Bones (Hirst C, ed), pp. 39-72

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4.3 Forthcoming Publications

BAETU TM.

Extrapolating Animal Consciousness

Studies in History and Philosophy of Science 104: 150-159

BRONSTEIN J, SRIDHAR H.

Connecting and Integrating Cooperation within and among Species

Philosophical Transactions of the Royal Society B

CANIGLIA G.

Practical Wisdom for Transdisciplinary Sustainability Science

In: Encyclopedia of Interdisciplinarity and Transdisciplinarity (Darbellay F, ed)

Edward Elgar Publishing: Cheltenham

CANIGLIA G, MERMANS E.

**Trans and Queer Methodologies in Philosophy of Science: An Exploratory
and Imaginative Exercise Outside of Cisheteronormativity and Its World**

In: Methods in Philosophy of Science (Veigl S, Currie A, eds)

MIT Press: Cambridge, MA



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.)

Routledge: London & New York

CURRIE TE, BORGERHOFF MULDER M, FOGARTY L, SCHLÜTER M, FOLKE C, HAIDER LJ, CANIGLIA G, WARING TM.

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

DE VLADAR H, SZATHMARY E, SANTOS M.

A Model for Genome Expansion: Eukaryogenesis and the Bioenergetic Release from Prokaryote Genome-Size Constraints

Proceedings of the National Academy of Sciences

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

HAN E, WEITZER J, BIRMANN BM, BERTAU B, ZENK L, CANIGLIA G, LAUBICHLER MD, SCHERNHAMMER E, STEINER G.

Association of Personality Traits and Socio-Environmental Factors with COVID-19 Pandemic-Related Conspiratorial Thinking in the DACH region

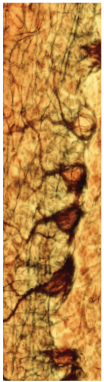
Social Sciences

LALA KN, ULLER T, FEINER N, FELDMAN MW, GILBERT SF.

Evolution Evolving: The Developmental Origins of Adaptation and Biodiversity

Princeton University Press: Princeton





84 MENATTI L.

Medicine, Healthcare and the Environment: From the Salutogenic Approach towards the Salutogenic Environments

Studies in History and Philosophy of Science

MENATTI L, BRENNER A-K, CHANAM J, KNICKEL M, SRIDHAR H, BUNCE C.

Adapting to Heatwaves: Reframing, Understanding, and Translating Strategies from India to the European Union

In: Climate Book (SSH CENTRE, ed)

Springer: Dordrecht

MENATTI L, WATERTON E, 'ANOLANI ALEGADO (kanaka 'oiwi) R, LEE E, SMILES ND, LIBOIRON M.

Book review of "Pollution Is Colonialism" by Max Liboiron, Duke University Press

Landscape Research, 1-12

MENÉNDEZ LP.

The Antiquity and Ancestral Origin of Humans in the Americas: A Five-Hundred-Year Query

Journal of Anthropological Sciences

MITTEROECKER P, FISCHER B.

Evolution of the Human Birth Canal

American Journal of Obstetrics and Gynecology

MORINI L, SAKAI A, VIBHUTE MA, KOCH Z, VOSS M, SCHOENMAKERS LLJ, HUCK WTS.

Leveraging Active Learning to Establish Efficient In Vitro Transcription and Translation from Bacterial Chromosomal DNA

American Chemical Society Omega 9: 19227-19235

NUÑO DE LA ROSA L, MÜLLER GB.

The Legacy and Evolvability of Pere Alberch's Ideas

Interface Focus

POLISELI L, CANIGLIA G.

Inter and Transdisciplinary Reasoning in Arts-Sciences-Humanities Interventions on Climate Change

Sustainability Science



SARTO-JACKSON I.

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: 7

SARTO-JACKSON I.

Die sozio-kulturelle Beschleunigung der Evolution

In: Wechselwirkungen und Zufall in der Evolution (Knoflacher M, ed)
Litverlag: Münster

SARTO-JACKSON I, MÜLLER GB, NEWMAN SA.

George McGhee—Visionary Scientist and Pioneer in Evo-Devo

Biological Theory 19: 1-2

SCHOENMAKERS LLJ, REYDON TAC, KIRSCHNING A.

Evolution at the Origins of Life?

Life 14: 175

SHAKYA B, LIU R, ARYAL K, THOMAS S, SHAOLIANG Y, CHETTRI N.

Ethnic Cuisines from the Eastern Himalaya: Revitalising and Sustaining Mountain Food Systems

ICIMOD

STADTMAUER D.

The Evolution of Cell and Tissue Identity at the Maternal-Fetal Interface

PhD Thesis, Yale University, New Haven

STADTMAUER DJ, BASANTA S, MAZIARZ JD, COLE AG, GÜLAY D, SMITH GR, VAN BREUKELEN F, PAVLICEV M, WAGNER GP.

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

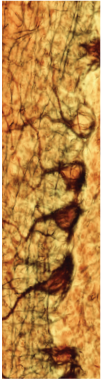
bioRxiv

VILLEGAS C.

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





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Volume 18, Issue 1:

SPIRIDONOV A, LOVEJOY S.

Scaling in the Evolution of Biodiversity

KEMP M.

Revisiting Leonardo on Muscles: Intimations of Mathematical Biology and Biomechanics

BRADY TP.

A Selected Look at Niche Construction Theory Including Its Incorporation of the Notion of Phenotype-Mediated Developmental Plasticity

GORDILLO-GARCÍA A.

Cultural Evolution and the Evolution of Cultural Information

KEENAN JP, MCSHEA DW.

Synergies Among Behaviors Drive the Discovery of Productive Interactions

SMIT H.

An Overarching Framework for Understanding and Explaining Human Nature

Volume 18, Issue 2:

BLUTE M.

Costs As a Key but too Often Neglected Component of Evolutionary Theory

MCGHEE GR Jr.

Evolutionary Theoretician Edward D. Cope and the Extended Evolutionary Synthesis Debate

BEEKMAN W, JOCHEMSEN H.

Self-Organization Through Semiosis



DRESOW M, LOVE AC.

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Teleonomy: Revisiting a Proposed Conceptual Replacement for Teleology

SIMS M.

Many Paths to Anticipatory Behavior: Anticipatory Model Acquisition Across Phylogenetic and Ontogenetic Timescales

SPENGLER RN III, KIENAST F, ROBERTS P, BOIVIN N, BEGUN DR, KSENIIA A, PETRAGLIA M.

Bearing Fruit: Miocene Apes and Rosaceous Fruit Evolution

Volume 18, Issue 3:

SARKAR S.

That was the Philosophy of Biology that was: Mainx, Woodger, Nagel, and Logical Empiricism, 1929–1961

VEIT W.

Complexity and the Evolution of Consciousness

JABLONKA E, GINSBURG S.

Sentience as a System Property: Learning Complexity and the Evolution of Consciousness

SPURRETT D.

Complexity, Valence, and Consciousness

VEIT W.

Defending the Pathological Complexity Thesis

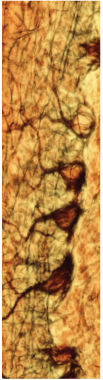
VEIGL SJ.

What Counts as an Immune Response? On the Role of Abiotic Stress in Immunology

LALA KN.

Lumpy Heads and Violent Genes: Moving Beyond Simple-Minded Explanations for Complex-Minded Folk





88 **Volume 18, Issue 4:**

PAIN R, SHIPTON C, BROWN RL.

Archaeology and Cognitive Evolution: Introduction to the Thematic Section

LOMBARD M, GÄRDENFORS P.

Causal Cognition and Theory of Mind in Evolutionary Cognitive Archaeology

SHIPTON C.

Miniaturization and Abstraction in the Later Stone Age

KILLIN A, PAIN R.

Cognitive Archaeology and the Minimum Necessary Competence Problem

BROMHAM L.

Meaning and Purpose: Using Phylogenies to Investigate Human History and Cultural Evolution

RAGINSKY M.

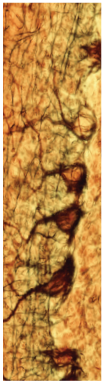
Biological Autonomy



Referees for Volume 18

WALLACE ARTHUR	KEVIN MITCHELL
NIMRA ASIF	AURORA NEDELCO
MARCELLO BARBIERI	DANIEL NICHOLSON
PIERRICK BOURRAT	PETER NONACS
SIMON BROWN	LAURA NUÑO DE LA ROSA
MATHIEU CHARBONNEAU	D. KIMBROUGH OLLER
ETHAN COCHRANE	STEVEN ORZACK
ADRIAN CURRIE	LUIZ PESSOA
DAVID DEPEW	CATHERINE READ
MAURIZIO ESPOSITO	JOAN ROUGHGARDEN
FLAVIA FABRIS	KEPA RUIZ MIRAZO
JUSTIN GARSON	SAHOTRA SARKAR
RICHARD GAWNE	ISABELLA SARTO-JACKSON
JOHN HAWKS	TAMAR SCHNEIDER
ADAM HUNT	GERHARD SCHOLZ
ALEX KACELNIK	SEVERIN SCHROEDER
ÇAGLAR KARACA	KIM STERELYN
MICHAEL KEARNEY	JAVIER SUAREZ
JONATHAN KLASSEN	BARTLOMIEJ SWIATCZAK
GREGORY KOHN	ALFRED TAUBER
MICHAEL LEVIN	ERIC TURKHEIMER
ROBERT LICKLITER	WALTER VEIT
SAM LIN	RICHARD WATSON
PEDRO TIAGO MARTINS	RICHARD WRANGHAM
KENNETH MCKENNA	SUREN ZOLYAN
ALESSANDRO MINELLI	





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4.5 Scientific Presentations

BUNCE C.

Narrative Sense-Making in Developmental Biology Research

Philosophy and Biology Shop Talks, Westfield, NC

BUNCE C.

Narrative Organization in Developmental Biology Research Reporting

International Society for the History Philosophy and Social Studies of Biology, Toronto

CANIGLIA G.

Practical Wisdom for Knowledge Co-Production in Sustainability Science

Bosch Academy for Transformational Leadership, Leuphana University, Lüneburg, online

CANIGLIA G.

Interconnected Health-Environmental Challenges: The Emergence of Participatory Evidence Regimes

Evidence Regimes Conference, TU Munich, Munich

CANIGLIA G.

Justice Is in the Details: Ethics and Transdisciplinary Sustainability Science

Leibniz Research Network Summer School "Doing Justice! Doing Just This!," ISOER, Dresden

CANIGLIA G.

Positionality, Ethics, and Evidence in Transdisciplinary Research

Monsoon Summer School, ZMT, Bremen

CANIGLIA G.

Practical Wisdom and the Ethics of Knowledge Co-Production

Stellenbosch University, Stellenbosch

CANIGLIA G.

Knowledge and Ethics for Sustainability Transformations: Capacities for Pluralism

Transforming Forests Conference, Wageningen University



CANIGLIA G, FREETH R, KNICKEL M.

**Navigating Transformative Change through Practical Wisdom:
From Personal to Teams and Organisations**

Transformation Conference 2023, Prague

KNICKEL M.

**Navigating Science-Society Collaboration: Lessons Learned
from Living Labs**

PRAGMATICK project (COST), Budapest

KNICKEL M.

**Reflecting on Living Lab Work in ROBUST: What Have We
Learned?**

University of Gloucestershire, online

KNICKEL M.

**Researchers' Perspectives on the Impact of Living Labs for
Sustainability Transitions in Rural Areas**

8th NEST Conference, Dresden

KNICKEL M.

**Researchers' Perspectives on the Impact of Living Labs for
Sustainability Transitions in Rural Areas**

XXIX European Society for Rural Sociology Congress, Rennes

KNICKEL M.

**Role of Researchers in Navigating Knowledge Co-Production
Processes in Inter- and Transdisciplinary Agri-Food and Rural
Research**

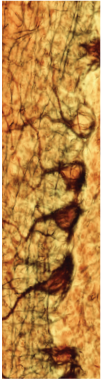
PAGE research group, University of Pisa

KNICKEL M.

**What Have We Learned from Monitoring and Evaluation of
Living Labs in ROBUST?**

GRANULAR Webinar, Session "Monitoring, Evaluating and Sustaining
Living Labs: Lessons learnt from EU's rural areas", online





92 KNICKEL M, ARCURI S, BRUNORI G.

A Decade of Living Labs for Sustainability Transitions in European Rural Areas: Researchers' Reflections on the Living Lab Approach

14th International Sustainability Transitions Conference 2023: Responsibility and Reflexivity in Transitions, Utrecht

MENATTI L.

Medicine, Healthcare and the Environment: From the Salutogenic Approach towards the Salutogenic Environments

Roto Rub Online Lectures, Ruhr University of Bochum, online

MENATTI L.

Pathogenic and Salutogenic Accounts of the Environment in Medicine. An Interdisciplinary Analysis at the Crossroads of Humanities and Medical Sciences

Unruly Microbes – Epidemics, Infections, and Ecologies of Change in Historical Perspective, Centre for the History of Medicine and Disease, Durham University

MENATTI L.

Paisaje, ambiente y salud desde la filosofía

V Jornada de Filosofía y Ciencia, National Center of Oncological Research, Madrid

MITTEROECKER P.

Trait Concepts and Confusions in Biostatistics and Evolutionary Theory

Workshop "Traits of Contention: Character Identification and Comparative Thinking in Evolutionary, Developmental, and Behavioural Biology," University of Leuven

PETRACCA E, GALLAGHER S.

Trust and Reliance in the Cognitive Institutions of Cryptocurrency

Science and Art of Simulation Workshop SAS23 "Reliability or Trustworthiness," High-Performance Computing Center (HLRS), University of Stuttgart

SARTO-JACKSON I.

Biocognition: Knowledge Accumulation in Biological Systems

MeiCogSci Lecture Series, University of Vienna

SARTO-JACKSON I.

History of Neuroscience through the Nobel prizes

Guest Lecture, Medical University of Vienna



SARTO-JACKSON I.

Epistemogenesis: Knowledge Accumulation in Biological Systems

Luskin Endowment for Thought Leadership Symposium – Pushing the Boundaries: Neuroscience, Cognition, and Life, UCLA Brain Research Institute, University of California, Los Angeles

SARTO-JACKSON I.

Die Bedeutung elementarer Bildung aus Sicht der Hirnforschung

“Tag der Elementarbildung,” College of Education, Vienna

SARTO-JACKSON I.

Elementarpädagogik und Hirnforschung

Workshop at “Tag der Elementarbildung,” College of Education, Vienna

SARTO-JACKSON I.

Warum ich weiß, was du fühlst

Brain Awareness Week 2022, Medical University of Vienna

SARTO-JACKSON I.

Gehirnentwicklung und soziale Bindungen

Urania, Vienna

SARTO-JACKSON I, SARTO P.

Entwicklungsneurobiologie sozialer Bindungen: Vulnerable Phasen und Interventionsmöglichkeiten

Fachtag „Bindung in der psychosozialen Beratung“, Katholische Hochschule Nordrhein-Westfalen, Köln

SARTO-JACKSON I, SCHÜGERL H.

Lernen und soziales Miteinander aus Sicht der Hirnforschung

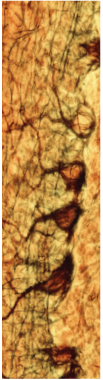
“Gesunde Schule” – „Tut gut!“ Gesundheitsvorsorge GmbH, Landesgesundheits Agentur Niederösterreich

SRIDHAR H.

An Elephant in the Room? The Place of Science and Scientists in Conservation Decision-Making in India

“The future of science: scientific archives and new research” Conference, University of Paris Nanterre





94 SRIDHAR H.

An Elephant in the Room? The Place of Science and Scientists in Conservation Decision-Making in India

Azim Premji University, Bangalore

SRIDHAR H, BOCCHI F, WITTEVEEN J.

An Elephant in the Room? The Place of Science and Scientists in Conservation Decision-Making in India

Symposium "Biodiversity Conservation: The Challenges of Producing Reliable Knowledge for Reliable Policy," Meeting of the European Philosophy of Science Association, Belgrade

SULTAN SE.

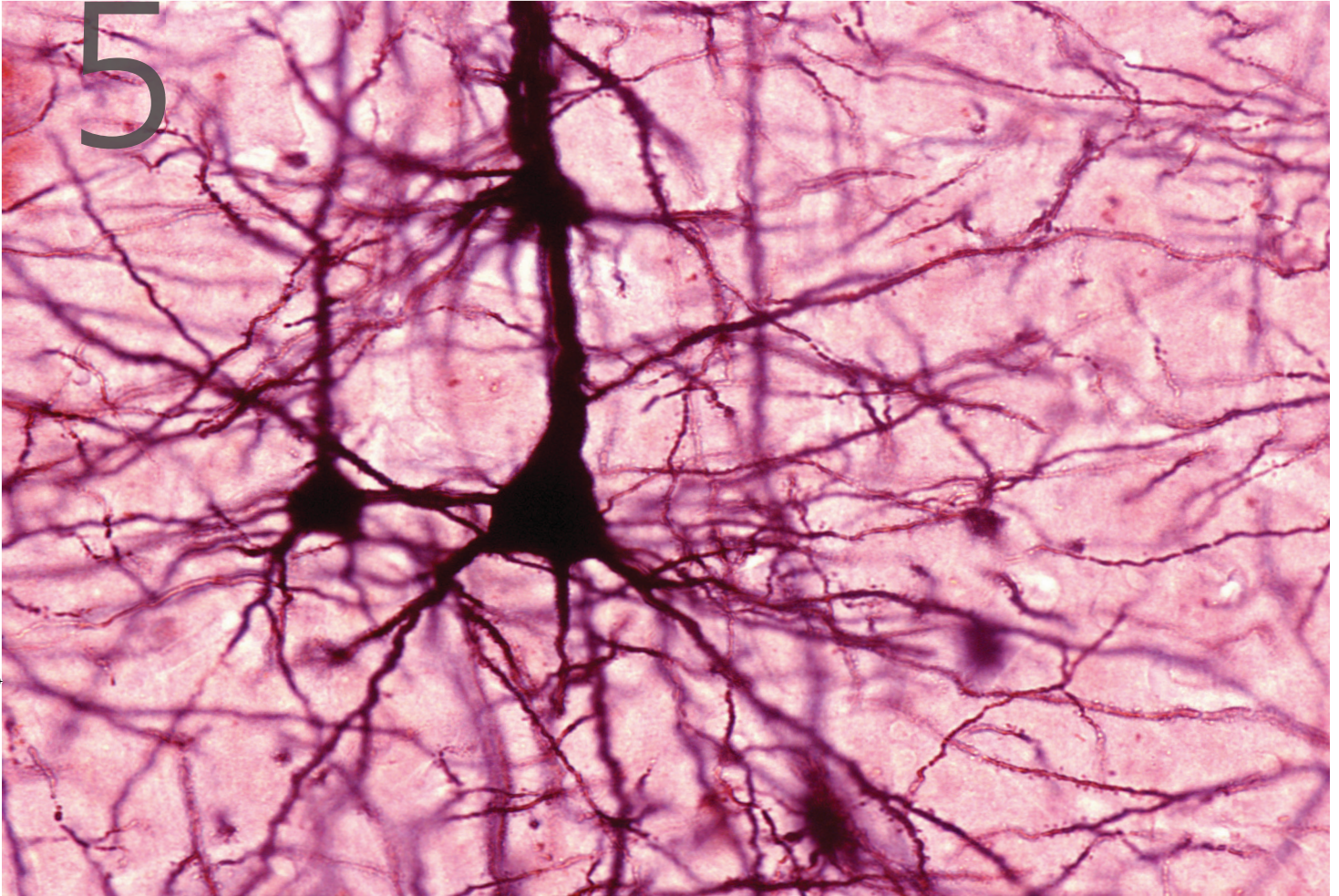
Unscripted Development: A Case Study in Plants

Allen Discovery Center, Tufts University





Further Activities



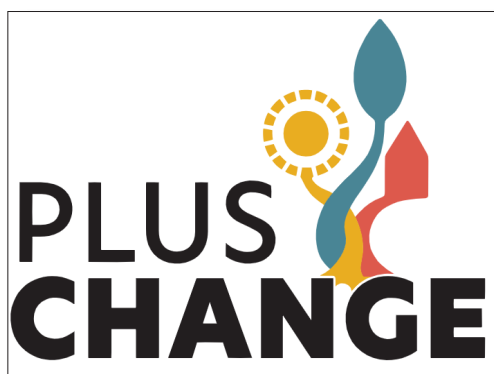
Many activities of the KLI support its mission and vision. Some representative activities are listed here.





5.1 Grants & Prizes

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Horizon Europe Framework Programme (HORIZON)
Call: Sustainable, Secure and Competitive Energy Supply
Guido CANIGLIA (KLI)

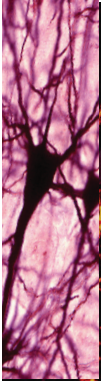
Co-Applicants: Julia MILDORFOVA LEVENTON (Czechglobe), Taliah DOMMERHOLT (Stichting Isocarp Institute Center of Urban Excellence), Kimberly MAJOR (Biobased Creations), Nyke SCHULP (Stichting VU), Tomas MILDORF (PLAN4ALL ZS), Vincent O'CONNELL (Peri-Urban Regions Platform Europe), Sandra SUMANE (Nodibinajums Baltic Studies Centre), Tadej BEVK (University of Ljubljana), Andrea BASSI (Knowledge SRL), Piotr MAGNUSZEWSKI (Stowarzyszenie Centrum Rozwiazan Systemowych), Anders WASTFELT (Stockholm University), Simeon VANO (University Constantine the Philosopher in Nitra), Jens NEWIG (Leuphana Universität Lüneburg), Monica LAZZARONI (Province of Lucca), Dunja MAHNE (RRA Zeleni Kras), Anja BRULL (Euregio Maas-Rhein), Elzbieta KOZUBEK (Wojewodztwo Mazowieckie), Paul VAN DER SLUYS (Vlaamse Landmaatschappij), Heidrun MOSCHITZ (Verein Parc Ela), Patrik REICHL (Regionalni rozvojova agentura jizni Moravy), Sandrine LACAZE (Ile de France), Deborah FOX (Surrey County Council)

PLUS Change Update 2023

Over the course of four years, PLUS Change will develop strategies to transform land use by prioritizing societal well-being, climate goals, and biodiversity conservation. Funded by Horizon Europe, the initiative brings together 23 institutions from across the European Union, United Kingdom, and Switzerland.

To understand the complex nature of land management PLUS Change combines various disciplines such as social sciences, humanities, and performing arts supported by land-use modelling and participatory scenarios. By working with planning authorities and regional development agencies, the project involves numerous stakeholders and practice cases. To identify alternative land uses and needs that consider these multiple perspectives, PLUS change is committed to upholding democratic, ethical, and equitable principles.





98 To ensure the integration of various perspectives within the project, Guido Caniglia and Marina Knickel from the KLI are leading a work package focused on facilitating transdisciplinary integration as a mutual learning process in PLUS change. The work package has four main tasks: fostering reflexive learning within the project, supporting integration into and from practice cases, as well as ethics, equity and justice in project activities and outcomes. During the project kick-off in Prague in June, Knickel and Caniglia led a workshop to introduce the work package to project partners. They began building a shared vision, a ‘roadmap’ for PLUS Change, establishing a safe environment to navigate integration processes that incorporate diverse voices and needs.

At the end of the project, PLUS Change will provide a planning toolkit with modelling tools, serious games, and engagement methods. These tools, along with policy recommendations at national and EU levels, aim to bridge gaps in sustainability research and drive behavioural and policy change. We are excited about the potential of PLUS Change to address the complex challenges of land management and to foster interdisciplinary collaboration, inclusivity, and responsible research practice.

More information can be found at the PLUS Change Website:
<https://pluschange.eu/>



COST Action: Transformations international Experience and Research network for Sustainable futures (TransformERS)

Guido CANIGLIA (KLI)

Together with the international network of researchers from 24 European universities, Guido Caniglia is the Austrian representative in the action contributing as lead of the Working Group on “Transdisciplinary Integration and Ethics” to the COST Action TransformERS.

The overarching aim of TransformERS is to inform research, policy and practice for transformations that deliver justice in a changing global context by bringing together and positioning research relevant to societal transformation. Such societal transformations are cited as highly necessary to avoid catastrophic climate change and biodiversity loss, and are called for in the IPCC and IPBES frameworks, as well as the European Green Deal. However, current research into transformations is highly fragmented. Pieces of relevant knowledge are held by policy-makers, practitioners, and researchers, from within a range of contexts, disciplines, projects and perspectives,



both within and outside of the sustainability research community. There is a need to put these separate pieces together to 1) identify what transformation-relevant knowledge is held and by whom 2) understand how the different pieces fit together; 3) understand what the big picture is — what we know about transformations collectively; and 4) identify the missing pieces — understand what we still need to create knowledge on. TransformERS creates a networking infrastructure to meet these 4 needs with objectives to 1) inform transformation policy; 2) shape transformations research and practice; 3) train transformations researchers from across broad disciplines and topics.

More information can be found at the COST Actions Website:
<https://www.cost.eu/actions/CA22156/>



Adapting to Heatwaves: Reframing, Understanding, and Translating Strategies from India to the European Union

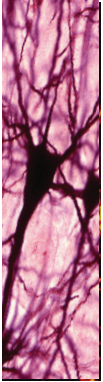
Anna-Katharina BRENNER, Corey BUNCE, Joyshree CHANAM, Marina KNICKEL, Laura MENATTI, Hari SRIDHAR; (all KLI)

Grant from the SSH Centre (Social Science & Humanities for Climate, Energy and Transport Research Excellence)

In spring 2023, six KLI fellows (in alphabetical order) Anna-Katharina Brenner, Corey Bunce, Joyshree Chanam, Marina Knickel, Laura Menatti, and Hari Sridhar pooled their strengths in Philosophy of Science, Biology, Sustainability Science, and Social Ecology to work on an interdisciplinary project for climate change adaptation. Laura Menatti and Corey Bunce led the project, while Guido Caniglia, Scientific Director of the KLI, facilitated the smooth and successful execution of this interdisciplinary effort. The team was rewarded a grant from the SSH Centre (Social Science & Humanities for Climate, Energy and Transport Research Excellence) last summer to contribute a book chapter on adaptation to climate change to the SSH Centre's multi-volume project on policy recommendations for the European Union. This January, they submitted their forthcoming chapter titled, "Adapting to Heatwaves: Reframing, understanding, and translating Strategies from India to the European Union."

The project integrates STEM perspectives with reasoning and knowledge from Social Sciences and Humanities (SSH), which are often excluded from climate





100 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.

The group held a Reflection session that was facilitated by Guido Caniglia on the 21st of Feb, during which the group walked back over the steps of the process and reflected on what worked and whether such strategies could guide future interdisciplinary endeavours. Beyond the book chapter, this project promises multiple outcomes, including presentations of the work at conferences as well as papers providing more detailed insights on adaptation to climate warming.



Best 2023 GAIA Paper Award

Guido Caniglia

Guido Caniglia and Coleen Vogel (University of Witwatersrand, South Africa) won the GAIA Best Paper Award 2023 for their article “On being oriented. Strengthening transgressive orientations in transdisciplinary sustainability research through queer theory.”



With its Best Paper Award, GAIA's Editorial Board honours the best article(s) 101 of the year. The article(s) are selected for their excellence and/or relevance, which are important criteria in sustainability research.

In their paper, Guido and Coleen advocate for strengthening transgressive orientations in transdisciplinary (TD) sustainability research through queer theory, and invites critical questions about research methods and researcher identities, prompting reflection on embracing the discomfort of challenging norms. Queering TD sustainability research implies the inclusion and empowerment of queer and marginalized actors in research spaces, and learning from those who resisted normalization. These actors bring valuable perspectives to guide research toward more just futures amidst social, political, and environmental crises. This perspective revolutionises and open new dialogues in transdisciplinary sustainability research.

Publication: Caniglia, G. and Vogel, C., 2023. On being oriented: Strengthening transgressive orientations in transdisciplinary sustainability research through queer theory. GAIA-Ecological Perspectives for Science and Society 32: 167-171.

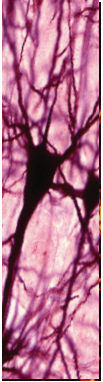


Werner Callebaut Prize

Sponsored by KLI

The Prize Committee of ISHPSSB (International Studies of the History, Philosophy, and Social Studies of Biology) consisting of Rachel Ankeny, James Grisemer, and Mael Lemoine has selected Devin Gouvêa (College of the Holy Cross in Worcester, MA) as the awardee of the Werner Callebaut Prize 2023. Gouvêa received the prize that is sponsored by the KLI for her paper "Historicizing the homology problem" published in *Studies in History and Philosophy of Science* 99: 56-66.





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Rohlf Medal for Excellence in Morphometric Methods and Applications

Stony Brook University, New York

The Rohlf Medal for Excellence in Morphometric Methods and Applications was established in 2006 by the family and friends of F. James Rohlf to mark his 70th birthday. Rohlf has been a longtime Stony Brook University faculty member and is currently Emeritus Distinguished Professor in the Department of Ecology and Evolution, and Research Professor in the Department of Anthropology.

Recipients of the Rohlf Medal are recognized for excellence in their sustained body of work on the development of new morphometric methods or for their applications in the biomedical sciences, including evolutionary biology, population biology, physical anthropology, and medicine.

The 2023 recipient of the medal was KLI President Philipp Mitteroecker who gave a lecture on "The (Mis)Measure of Human Evolution."

5.2 Events (Co-)organized by KLI Fellows



Reading Group Vienna Science Studies Laboratory

*Organizers: LAURA MENATTI (KLI),
SOPHIE VEIGL (University of Vienna),
STEPHANIA DONAYRE PIMENTEL
(Central European University), Maria
FEDOROVA (Central European
University)*

*Directors: Guido CANIGLIA (KLI), Maria KRONFELDNER (CEU), Martin KUSCH
(University of Vienna)*



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 II/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." For co-organizer Laura Menatti the Lab is a great occasion to meet new scholars in a constructive way and based on feminist and inclusive values: "I was very proud to introduce in the last meeting of 2023 the book by Max Liboiron "Pollution is Colonialism" (2021) as it allowed us to think, reflect and reconsider science, scientific practices and methods as intertwined with the ethical and environmental recognition of the Land, nature and landscape(s)." The reading group will continue and is open to everyone interested. Details and dates are publicly announced.

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.

5.3 Interviews

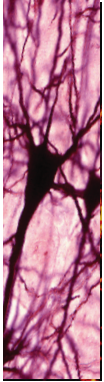
CANIGLIA G.

Interviewed by Hernán Bobadilla (Polytechnic University of Milan)

for the newsletter of the Society for Philosophy of Science in Practice (SPSP#20)

<https://sway.cloud.microsoft/HgRjMd90JcuAl4Og?>





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Interviewed by Rika Preiser (Stellenbosch University, South Africa)

for the blog of the Centre for Sustainability Transitions (CST) at the Stellenbosch University

<https://www0.sun.ac.za/cst/news/collaboration-and-knowledge-co-production-on-the-agenda-during-dr-guido-caniglia-visit/>

MÜLLER GB.

Interviewed by Kalevi Kull (University of Tartu)

for the journal Biosemiotics

<https://link.springer.com/article/10.1007/s12304-023-09543-w?>

SARTO-JACKSON I.

How Social Interactions Shape the Human Mind

Podcast "The Dissenter" hosted by Richardo Lopes

<https://www.thedissenter.net/podcast/919-isabella-sarto-jackson-how-social-interactions-shape-the-human-mind/>

SULTAN SE.

The Entangled Organism: A Conversation with Sonia Sultan

Podcast "Big Biology" hosted by Cameron Ghalambor and Lynn Martin

<https://www.bigbiology.org/episodes/2023/12/14/ep-112-the-entangled-organism-with-sonia-sultan>

5.4 Acknowledgment

The KLI is grateful to the Office of the State Government of Lower Austria, Department of Science and Research for additional financial support that contributed to the pursuit of the KLI's scientific endeavors.

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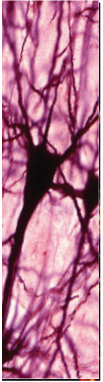
Further Activities

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activities of the KLI 2023



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