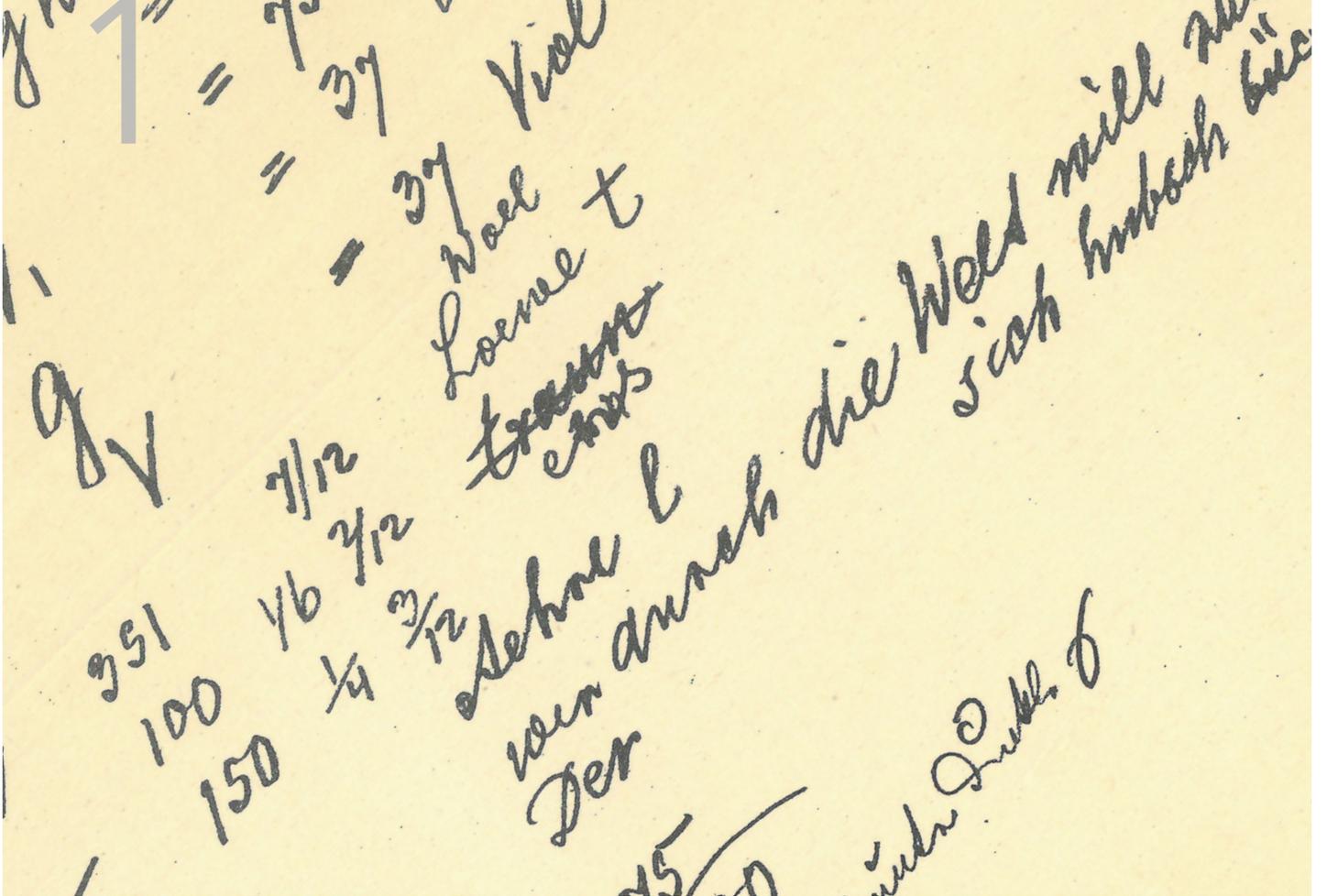


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## Review 2020 and Structure of the KLI



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The KLI – "small gem of big fame"

Vidyanand Nanjudiah,  
Indian Institute of Science, Bangalore

## 1.1 The Year in Review

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One year into the Covid-19 pandemic, the KLI has adapted to the challenges that came with it. Strict health and safety measures had to be implemented. Regrettably, the KLI fellows had to spend a lot of their precious fellowship time in home office, quite in contrast to the ambition of the KLI to foster personal interaction. Nearly all meetings and lectures had to be held as virtual events, except for the rare times when personal meetings were possible. One benefit of this situation was that our online seminars could now be joined by many more participants from all over the world. This increase of visibility was further enhanced by an expanded use of social media in the dissemination of the KLI activities.

Despite the pandemic, we received a large number of applications from international researchers. In addition, a dedicated call for Writing-up Fellowships in the area of “Interdisciplinary Sustainability Science” attracted nearly 100 applicants. Altogether, in 2020, we hosted 31 fellows, most of them in residence, as travel restrictions made it possible for only 7 visiting fellows to come to the KLI. In order to help alleviate economic hardships for the fellows due to bottlenecks in the job market caused by the pandemic, a KLI Solidarity Grant was established that permits an extension of the fellowship period. So far, three fellows have benefited from this support.

2020 also saw the implementation of several new event formats: Working Groups that comprise 3 meetings over the course of one and a half years; the “KLI Lab,” an in-house meeting format that provides space for reading groups, discussions, talk rehearsals, or informal lectures; new events on Science Communication, an increasingly relevant practice for scientists, organized by the KLI postdocs.

Although the year has been challenging for all of us, especially those fellows were affected who came to Austria on their own and did not have time to establish a network of friends before the various periods of lockdown. We have tried to make their experience as positive as possible, providing support in all administrative matters and ensuring continued interaction through the virtual platforms.

I am very grateful to the KLI leadership team, Guido Caniglia, Isabella Sarto-Jackson, and Eva Lackner, for steering us so well through the troubled periods of 2020. 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. As always, my special thanks go to Traudl Engelhorn, who observes our activities with everlasting curiosity.

Gerd B. Müller  
President

## 1.2 The KLI

0 14 20 Jahre l. Wohl nicht nur  
sein durch die sich hinhalt bis

- 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 five different categories; granting decisions are based on international peer review. The KLI also pursues its objectives by organizing international workshops, summer schools, and colloquia, and by publishing a scientific journal and a book series.

## 1.3 Organization of the KLI

### Board of Directors

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PROF. DR. D. KIMBROUGH OLLER

School of Audiology and Speech-Language Pathology, University of Memphis, TN

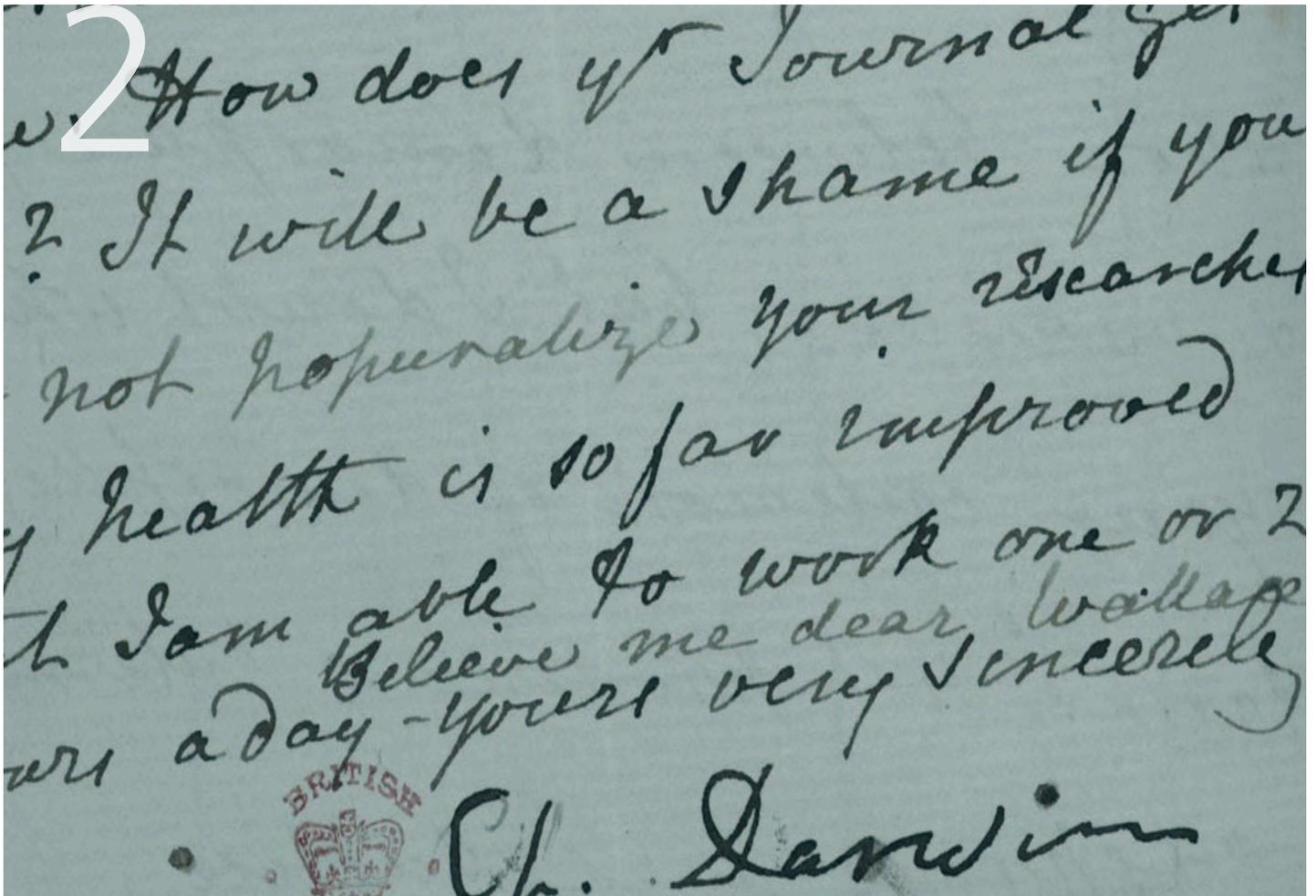
PROF. DR. KATRIN SCHAEFER

Department of Evolutionary Anthropology, University of Vienna

DR. STEFANIE WIDDER

Center of Molecular Medicine of the 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

In 2020, the KLI received a total of 140 applications for fellowships in residence, 13 of these were granted for 2020 or 2021. Many visiting fellowships had to be cancelled due to travel restrictions as a consequence of the COVID-19 pandemic, those visitors who could come to the KLI are listed in section 2.5 of the report.

	applied	granted
Writing-Up Fellowships	105	6
Postdoctoral Fellowships	29	7
Senior Fellowships	6	0

## 2.2 Writing-Up Fellowships

### Amitangshu ACHARYA

(February – July 2020)



*A human geographer by training, Amitangshu Acharya specializes in the interdisciplinary field of political ecology. He is a Leverhulme Trust PhD Scholar at the Institute of Geography, School of GeoSciences, University of Edinburgh. His PhD research, which bridges political ecology with technology studies and science, attempts to unpack the rising popularity of domestic water purifiers in middle-class homes in India. Amitangshu believes that an enquiry into ‘small’ technologies like ‘purifiers’ can not only open up new ontological questions on water but also decode the cultural politics shaping the rising technopolitical mediation of urban environments in the majority world. Amitangshu completed his Master’s from Tata Institute of Social Sciences, Mumbai and then received the Sir Ratan Tata Trust Scholarship to pursue an MSc in environment, culture, and society at the University of Edinburgh. He is also a recipient of the Centenary Research Fund, University of Edinburgh and IJURR Foundation Writing Up Grant. He believes in the taking academic research*



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*into the public domain and has worked towards such a cause by writing regularly in news outlets like The Independent, UK; Huffington Post, India; Khaleej Times, UAE; The Economic Times, India, The Hindu, India. He was successfully selected to participate in a National Geographic slow journalism workshop conducted by Pulitzer Prize-winning journalist, Paul Salopek. His earlier research publication on local knowledge-based flood forecasting in India was cited and discussed in the IPCC, Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC).*

### **A Political Ecology of Small Things: The Curious Case of Domestic Water Purifiers in Bhuj City, Gujarat, India**

A paradox lies at the heart of India's urban water supply. The 2018 national budget allocated 2.9 billion USD for urban water supply projects. In parallel, the market for domestic water purifiers, mostly using reverse osmosis (i.e., RO) technology, is currently valued at 1.1 billion USD and is growing at 15-20%. This previously unresearched phenomenon, highlights a critical gap in the field of Urban Political Ecology (UPE) – namely, water quality. UPE has produced a rich volume of work on neoliberalisation of centralized water supply technologies, and questions of access, affordability, governance and justice. Interrogation of how water quality animates these issues has been limited.

My research in the small city of Bhuj, in the state of Gujarat in India, explores the rising popularity of RO-based water purifiers among the city's middle classes – a pan Indian phenomenon. These small technologies fundamentally alter the taste of 'hard' water through the removal of minerals creating an enduring preference for treated water. This, as I show, it is an indicator of a parasitical form of urban water privatisation. One that profiteers neither through control of public infrastructure or the setting up of parallel supply, but by offering a techno-fix to weakened public services. My research shows how small technologies tend to close the public debate on urban water quality in the Global South. It disconnects the middle-classes from health risks of consuming poor-quality public water supply. This works to further normalize indifference towards inequity and differentiated water access in uneven urban landscapes.

**Hernan BOBADILLA RODRÍGUEZ**

(February – October 2020)



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*In 2009, Hernan Bobadilla completed his BSc degree in geology at the University of Chile. From 2010 to 2012, he continued his studies in geology, developing an MSc dissertation on the geochemistry of the Northern Antarctic Peninsula Batholith and its implications for the tectonic evolution of the Antarctic Peninsula. With this thesis, he was awarded his MSc and professional degrees with highest distinction. As a geologist, he worked for mineral exploration companies and the Chilean Geological and Mining Survey. From 2014 to 2015, Hernan pursued an MSc degree in history and philosophy of science at University College London. For his dissertation, he worked on assessing production accounts of causality in seismic phenomena. He was awarded a MSc degree with distinction and his dissertation won the prize for “Best Contribution to the Science and Technology Studies Department by an MSc Student.”*

*In February 2016, Hernan became a member of the DK Programme ‘The Sciences in Historical, Philosophical and Cultural Contexts’ at University of Vienna. His main research interests are philosophy of causality and philosophy of modelling and simulations, with a special focus on Earth sciences. Further research interests are process metaphysics, pluralism, scientific evidence, complex systems, emergence, chaotic behavior, robustness and philosophy of science in practice.*

**Exploring and Understanding with Different Explanatory Commitments: A Case Study in Models of Earthquakes**

Scientific models play a crucial role in attaining various epistemic achievements in the natural sciences. However, only recently philosophers of science have started to discuss the achievement of understanding by means of modeling.



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In particular, scarce attention has been given to the attainment of understanding via exploratory models. The purpose of this project is to provide a philosophical model of scientific research with highly idealized exploratory models, which conduces to the attainment of different kinds of explanations and understanding. In order to achieve this goal, I conduct two case studies based on exploratory models of earthquakes. I identify the explanatory commitments that guide the construction and interpretation of the models of earthquakes by engaging in content analysis of the papers in which the models were first introduced. I also assess the influence of such explanatory commitments in attaining particular kinds of explanations and understanding. This allows me to deliver a novel philosophical model. I suggest that scientific exploration can be conducted in a programmatic or prospective mode. That is, the construction and interpretation of models can align or challenge the core explanatory commitments of a research program. These different modes of exploration conduce to distinct epistemic achievements. In particular, I characterize the kind of understanding attained with prospective models.



### **Guillermo BRAVO MORANTE**

(January – July 2020)

*Guillermo Bravo Morante holds a Master's degree in biology and is currently pursuing a PhD in human evolution, forensic, and physical anthropology from the University of Granada and the University of Vienna. He has been awarded a KLI writing-up fellowship to complete his thesis.*

### **Predicting Age at Death from the Shape of the Human Pubic Symphysis by Bandpass Filtering of Bending Energy**

In forensics, establishing the biological profile is the first and most crucial step toward successful identification. One

of the most difficult parameters to estimate with accuracy is age at death. For this purpose, we exploit the state of development of the pubic symphysis, due to its robustness, to be extended by parallel analyses of other remains when available. Our proposed method is based on contrasts between the process of osteogenesis in the first 30 years of life and the later degenerative processes of aging, during which the shape of the symphyseal surface changes notably. A purely visual classification of this progression is unreliable. The use of a surface scanner to model the pubic symphysis makes it possible to carry out this task more objectively.

For this, we used an Artec Spider (Artec Group) to scan a sample of 400 male individuals aged between 14 and 82 years from the collection of the Laboratory of Anthropology at the University of Granada, all of them Mediterranean and from the last century; each pubis was landmarked following a 102-point template of two fixed landmarks on the top and the bottom of the symphysis along with 100 surface semilandmarks. From the sample we selected the 381 specimens within Procrustes distance 0.05 of the side-specific average, rotated to the standard geometric morphometrics basis of partial warp scores, and then, separately by side for ages under 50, correlated age with summed squared partial warps (PW) amplitudes over a wide range of plausible bandpass filters omitting the uniform term. Peak correlations were -0.524 both for the PW1-PW6 band on the right side and for the PW1-PW7 band on the left side, and the geometry of singular warps PW by PW was virtually identical between the two analyses.

We calculated a standard error of prediction of 8.3 although, for the complexity of the regression, we consider it an inappropriate way of reviewing the accuracy of the method. Thus, we predicted the logarithm of age instead of age per se, obtaining a higher correlation, -0.568, with a standard error of -23% to 29% around the estimated age. There is a strong age signal in symphyseal surface shape that is not a reduced roughness per se but rather a flattening at large scales.

The method is implemented in a version of the easy-to-use R statistical software package, making it easy to combine with other modern geometric morphometrics methods and ready to apply in other samples.



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### Esther CARMEN

(February – July 2020)

*Esther Carmen is a PhD student of community resilience and social capital at University of Dundee. She has been an interdisciplinary scientific researcher with seven years experience examining socio-political dimensions of environmental challenges across multiple scales. This includes experience working in transdisciplinary teams, coordinating a complex action-research project to build community resilience in the context of climate change, engaging and exchanging knowledge with diverse groups of stakeholders, and leading research within EU projects relating to biodiversity science-policy-practice interfaces. Prior to this, she had nine years experience working in wetland biodiversity and fisheries management in the UK and two years working in Cambodia focusing on knowledge exchange and capacity building for community natural resource management.*

### **Socio-Cultural Dimensions of Social Capital for Community Resilience in the Context of Climate Change**

While there has been growing emphasis on the importance of social capital in shaping social-ecological resilience and processes leading towards more sustainable trajectories, there has been limited attention to the deeper socio-cultural dimensions involved. The aim of this proposal for the fellowship is to examine the nature and role of socio-cultural dimensions of social capital in shaping a community level socio-ecological change initiative. This builds on my previous and current interdisciplinary PhD work which has so far examined the role of social relationships in community change initiatives and diverse factors shaping these processes. For the KLI fellowship, I will build on this work and apply an interpretivist methodology and a transdisciplinary philosophy to analyse data already collected. This data relates to socio-cultural dimensions interacting with social relationships in systemic oriented climate change initiatives. The work is important and novel given the limited attention to a socio-cultural approach to social capital in resilience building.

**Lisa LEHNER**

(October 2020 – March 2021)



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*Lisa Lehner is a PhD candidate at the Department of Science & Technology Studies, Cornell University, and was previously affiliated with the Department of Science-Technology-Society at the University of Vienna and the Ludwig Boltzmann Institute for Health Promotion Research. She works at the intersection of science studies, medical anthropology, critical public health, and multispecies research. Her current project is exploring patients' experiences living with and getting treated for Hepatitis C viral infections. She is a member of the SoNAR-Global Network for infectious disease preparedness, and is a past recipient of a Dan David Prize Scholarship in the field of "Bioethics" for her dissertation project and the Austrian State Prize recognizing excellent Master's degree graduates. Lisa is also a lecturer at the University of Vienna.*

**Living with Infectivity**

Given the ever-looming reality of the next pandemic threat, my project provides a fundamental re-conceptualization of the implicit social theory that undergirds current global health responses. I build on 18 months of extensive field research in Austria, studying the changes wrought on care practices and illness experiences by new Hepatitis C antiviral drugs, whose curative potential fueled an expansive global health virus eradication project. I integrate diverse social-science concepts to analyze the material and discursive mechanisms that animate particular forms of applying biomedical and epidemiological knowledge in contemporary society and global health politics. I will leverage my findings to conceive of a different kind of social theory of infectivity that accepts not just the reality of large-scale and globe-spanning viral infections, but also responsibility for a connected global society. I argue that the way we address and live with infectivity is integral to the way we choose to live as a society. In turn, changing our ways will unleash the full systemic potential of the life and social sciences to meet infectious challenges present and future.



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### Ashley LEWIS

(September 2020 – March 2021)

*Ashley Lewis holds a Bachelor's degree in public relations/communications from the University of Texas, Austin and a Master's degree in international relations from the Centre for the Study of Democracy of the University of Westminster. She is currently pursuing her PhD at the University of Nottingham and is an ethnographer of an interdisciplinary research project "Sustaining Urban Habitats." She studies interdisciplinary collaboration in practice and interrogates the different definitions, assumptions, and promises surrounding interdisciplinary research across the natural and social sciences.*

*Her current research interests include science and technology studies, critical discourse analysis, interdisciplinarity, scientific expertise and evidence, self-reflexivity, ethnography, sustainability science and Mode 2 knowledge.*

### STS Researchers as Methods: A Reflexive Critique

My proposed KLI project will elaborate on the methodological underpinnings of my PhD research project and will be based on the reflexivity section of methods chapter. My PhD research is an ethnographic study of interdisciplinary researchers investigating urban sustainability. As an ethnographer and science and technology studies (STS) researcher on the project, my position observed the interdisciplinary element of the research collaboration. I investigated the challenges, perceptions and approaches to interdisciplinarity working among researchers who spanned the natural and social sciences. Once I started working on the project, it became clear that my position as an 'outsider' allowed me to make observations about ways of working; but my simultaneous position as an 'insider' actually influenced the interdisciplinary efforts made. My position as the 'interdisciplinary observer' therefore had two major effects on the other researchers. Firstly, it created an additional awareness and self-reflection on the type of work researchers were doing; and it caused them to reflect and evaluate if their work was 'interdisciplinary' enough. Secondly, because my

position as an ethnographer of interdisciplinarity was written in at the application phase, this elevated the importance of interdisciplinary collaboration of the project. By creating a position to solely observe interdisciplinary collaborations, researchers perceived interdisciplinarity to be an important research objective and were then motivated to do their work in a more interdisciplinary way. For the research project at KLI, I want to conduct a reflexive methodological analysis of my role not only as an observer, but as an actual research method.

### **Julia STUHLTRÄGER**

(February – August 2020)



*Julia Stuhlträger is a doctoral student at the Max Planck Weizmann Center for Integrative Archaeology and Anthropology. She is primarily interested in extant and extinct primates (especially chimpanzees and hominins). Recently, she was awarded a KLI writing-up fellowship to complete her PhD thesis.*

*Her research focuses on the form and function of hard tissues of the masticatory apparatus as well as on dietary adaptation. The main target is to quantify dental tissues three-dimensionally getting a more complete picture of physiological responses to dietary shifts, and to find out how these shifts are reflected in tooth wear.*

### **Tooth Wear and Dietary Shifts in Western Chimpanzees (*Pan troglodytes verus*)**

Diet is a direct link between an animal and its environment, and is hypothesized to be a key driver behind hominin speciation. To unravel dietary shifts within fossil hominins, we first need a good understanding of the dietary ecology and intraspecific variation in living primates. As our closest living relatives, chimpanzees may be especially relevant for studying the nature in fossil hominins. Their taxonomic diversity provides a unique opportunity to examine intraspecific



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variation. Furthermore, studies of patterning of intraspecific variation should allow more closely investigating questions about their local adaptations, environmental changes, and occupation of ecological niches.

My research will focus on the form and function of teeth and dietary adaptation in chimpanzees. The main target is to quantify tooth wear, getting a more complete picture of physiological responses to dietary as well as environmental shifts, and to find out how these shifts are reflected in tooth wear. Therefore, I investigate first the microscopic tooth wear in specimens of a very well-studied chimpanzee population (*Pan troglodytes verus* from the Tai National Park) and compare it to specimens from a historical population of the same subspecies from Liberia to test the influence of dietary and environmental shifts in one subspecies. Second, I examine the cusp topography in several molar wear stages (macroscopic tooth wear) in the same chimpanzee specimens to test whether long-term dietary and environmental shifts are reflected in the tooth occlusal morphology.

This project will provide a comprehensive picture of dietary and functional masticatory adaptations in two populations of *P. t. verus*, and may help to better understand the feeding ecology and morphological adaptations in fossil hominins.



### **Anna SUNDERMANN**

(November 2020 – April 2021)

*Since 2013, Anna Sundermann is a research fellow and a PhD candidate at the Institute for Environmental and Sustainability Communication at the Leuphana University Lüneburg. Currently she is working for the UNESCO Chair on Higher Education for Sustainable Development and the SuCo2-Working group on students' sustainability related learning processes in Higher Education. Before she started to work at Leuphana, she got a diploma in psychology with a focus on educational psychology at Westfälische-Wilhelms-University Münster and was*

*engaged in the student initiative Weitblick e.V. Since then, her main interest is in analyzing learning processes to find out if the current integration of sustainability in higher education empowers and motivates students to engage in societal transformation.*

### **How Studying Sustainability Affects Students' Understanding of Sustainability: A Longitudinal Analysis of Undergraduates' Learning Processes and Outcomes**

Learning outcomes in higher education for sustainable development (HESD) have become a major focus in recent years. One of the key learning outcomes are students' sustainability conceptions which enable individuals to assess a problem from multiple sustainability perspectives in order to deal with complex sustainability issues in their future professional fields. Universities, however, seem to fall short in sufficiently equipping students with more elaborated sustainability conceptions. One reason is probably that none of the existing frameworks links sustainability conceptions to the influencing factors on all levels of higher education over the course of the studies. If universities want to monitor learning processes in their students' sustainability conceptions, they should consider all internal and external conditions influencing the learning process in the higher education system. Thus, further research efforts need to be pursued regarding the operationalization of learning outcomes. Therefore, this qualitative meta-analysis proposes a process-oriented framework of internal and external factors that influence students' sustainability conceptions. Hence, this paper contributes to the literature in HESD by moving away from a focus on individual students or cross-sectional course evaluations towards an understanding of what shapes students' sustainability conceptions over time. Although exploratory, the framework is intended to be used as a general scheme of how to operationalize learning processes for the design of curricula, courses or monitoring in HESD.



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### Sophie Juliane VEIGL

(November 2019 – April 2020)

*Sophie Veigl is a fellow at the DK Programme 'The Sciences in Historical, Philosophical and Cultural Contexts.' She studied microbiology and genetics, immunology, history and philosophy of science as well as comparative literature at the University of Vienna. She worked as a guest researcher at Tel Aviv University and the University of Cambridge as well as at the Gurdon Institute. One central question that motivates her research is how and to which ends should philosophers of science be normative about their fields of study. In her current research project, she investigates whether certain species of RNA can act as alternative trajectories of inheritance, and whether that constitutes a case for theoretical pluralism. In addition, she works closely together with leading researchers in RNA inheritance to test how resonant her claims are with the notions of the relevant actors. She has been awarded a writing-up fellowship by the KLI to complete her PhD thesis.*

### Testing Scientific Pluralism

Scientific Pluralism has become a popular position in the philosophy of science and the philosophy of biology in particular. In recent years, debates centering around the extended evolutionary synthesis have also received a pluralist interpretation. While pluralism seems appealing to many philosophers of science, it also has a significant impact on the conduct of research, and thus concerns scientists. However, the question whether scientific pluralism is resonant with researchers' aims and goals remains unanswered. I therefore attempt a first case study, that combines philosophical and sociological methods in order to "test" scientific pluralism in the sciences. The subject of my case study are alternative trajectories of inheritance, and their bearing on theoretical pluralism in the extended evolutionary synthesis. Through this case-study, I aim at contributing a first interdisciplinary approach towards scientific pluralism.

**Jacob Orion WEGER**

(October 2020 – March 2021)

*Jacob Weger is a PhD Candidate in anthropology at the University of Georgia and holds a Bachelor's degree in sociology/anthropology from Lewis & Clark College in Portland, Oregon. Specializing in environmental and cultural anthropology, he works at the intersection of political ecology and science & technology studies, with research interests in climate change, environmental governance, sustainability and development, delta transformations, and a regional specialization in Vietnam and Southeast Asia. His PhD dissertation focuses on the politics of knowledge and translation involved in the governance of climate change adaptation in the Mekong Delta and has been funded by the U.S. National Science Foundation, U.S. Department of Education Fulbright-Hays Fellowship, and the University of Georgia.*



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**Delta Variations: Politics of Translation in the Governance of Climate Change Adaptation in the Mekong Delta, Vietnam**

This project explores how knowledge is translated into practical action and socio-environmental change under the guise of climate change adaptation, shedding light on the evolution of deltaic landscapes in the context of climate change and socioeconomic development. Based on 19 months of multi-sited ethnographic fieldwork in the Netherlands and Vietnam, and employing data from a variety of sources, the study examines the politics of knowledge and translation involved in the transnational governance of climate change adaptation in the Mekong Delta. During my time at the KLI, I will complete at least two dissertation chapters while further honing my overarching conceptual framework and reflecting on the implications of the research for sustainability science and climate adaptation more broadly. The first chapter focuses on the historical production of Dutch expertise in water and delta management and its translation to the Vietnamese context. The second examines the translation of



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knowledge for climate adaptation across levels of governance within Vietnam, highlighting the role of intermediary actors such as scientists and bureaucrats in the midst of a hierarchical politics of implementation. This project brings together anthropology, environmental history, Earth Systems science, and development studies, as well as the critical theoretical perspectives of political ecology and science and technology studies, to interrogate the cross-scalar governance of climate change adaptation. In doing so, it offers insights into processes of socio-material change in order to aid efforts to advance more just and sustainable transformations.

### 2.3 Postdoctoral Fellowships



#### **Orsolya BAJER-MOLNÁR**

(November 2020 – October 2021)

*Orsolya R. Bajer-Molnár is an evolutionary biologist, with a passion for both research and education. She received her Master's diploma from Eötvös Loránd University in evolutionary biology, ecology and systematics. Five years later, she completed her PhD in behavioural ecology and evolutionary biology. She then won a postdoctoral scholarship at Dartmouth College, NH, after which she continued research at UFRN in Brazil. Upon returning, she turned towards the evolutionary dynamics of emerging infectious diseases, which she is currently working on in collaboration with the University of Nebraska and Centre for Ecology Research (Hungary).*

*Throughout her research, she had always been interested in science communication. Overseas she organized networking events, conferences and outreach programmes, and taught graduate and undergraduate students. She took an active role in science communication, and after numerous appearances she just recently gave a TedX*

*talk. Her aim is to increase the visibility of research, and thus facilitate a combined effort to prevent the emerging infectious diseases.*

### **Preaction Plan – Implementing Disease Prevention in Modern Society**

Emerging Infectious Diseases (EIDs) are one of the major threats on global human health and economy, with an increasing number of novel epidemics appearing each year. Although they vary in pathogen and severity, the underlying evolutionary processes of emergence are shared by all, it is therefore through these drivers that we can predict and act to prevent outbreaks. The DAMA protocol was developed as a framework for coping with EIDs, where *Documentation* of potential pathogens is followed by an *Assessment* of the risk they pose. High-risk taxa and their reservoir hosts are then *Monitored* to reveal geographic distribution and an *Action* plan can be developed to avoid infection of human and/or economically significant species (livestock, crops).

As a comprehensive protocol, the DAMA's final Action phase requires the efficient and fluent collaboration of multiple diverse fields, such as research, health care, economics, politics and policy-making. My proposal aims to initiate targeted discussions with experts of the mentioned areas in an effort to create crucial guidelines and scenarios for the implementation of the DAMA protocol. My work will include contacting current and potential collaborators, round-table discussions, analysis of case studies, theoretical simulations of hypothetical epidemics and the creation of final reports containing significant challenges, recommendations and action plans specific for each field.

As a member of the KLI community, I will also use this opportunity to invite collaborators to contribute to the institute in the form of talks, seminars and symposia, and further raise awareness about EIDs among the general public through various tools of science communication.



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**Sidney CARLS-DIAMANTE**

(May 2018 – May 2020)

*Sidney Carls-Diamante has received a PhD in philosophy from the University of Auckland. Her doctoral thesis explored how the octopus nervous system challenges a number of received views on the nature of cognition and consciousness. She has been awarded a KLI postdoctoral fellowship to work on a project entitled ‘The Free Energy Principle: From Promises to Premises.’ The aforesaid project explores how the theoretical framework of the free energy principle theory of cognitive brain function can be refined.*

**The Free Energy Principle: From Promises to Premises**

This project explores the free energy principle (FEP), a highly controversial neuroscientific theory that claims that all forms of brain function can be reduced to a single type of process. The proponents of the FEP claim that if their theory is correct, it has the potential to 1) unify explanation in neuroscience, and 2) identify a fundamental ontological feature definitive of biological organisms. These unificatory and evolutionary claims are highly attractive, as they address two major issues surrounding the nature of theory in cognitive neuroscience. However, the extreme reductionism of the FEP has raised concerns about its explanatory validity, in particular that it comes across as an unfalsifiable ‘theory of everything.’ In order to secure its place as a plausible theory of brain function and ultimately cognition, the FEP must first pass empirical and theoretical muster. This calls for two things: first, that its claims be verified by empirical testing, and second, that its claims be whittled down into more manageable premises detailing how it can bear out its unificatory and evolutionary promises.

**Roberto CAZZOLLA GATTI**

(January 2020 – January 2021)

*Roberto Cazzolla Gatti is an Italian environmental and evolutionary biologist, and a biodiversity expert, who studies the diversity, behaviour, evolution, and ecology of species on Earth. He is an associate professor and the head and scientific coordinator of the MSc program in biodiversity at the Biological Institute of the Tomsk State University, Russia.*

*He also works as a freelance documentary photographer and wildlife filmmaker and coordinates geographic and scientific explorations of some of the most remote places on Earth. In 2019, his documentary-film on the biodiversity of Congo river basin's forests entitled "Ivindo: a journey into the green heart of Africa" was released by the Colibri Studio Productions.*



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### **The Role of Niche Emergence and Diversity Autocatalysis in the Evolution of Biodiversity, Socio-Economic Sustainability, and Developmental Biology**

There are few studies and theories that clearly explain why the number of niches is so variable through ecosystems and how can several similar species live in the same environment. In my early work, I showed that the number of niches in an ecosystem depends on the number of species extant in a particular time and that the species themselves allow the enhancement of niches in terms of space and number. I firstly resumed these hypotheses, after some empirical studies, in the Biodiversity-related Niches Differentiation Theory (BNDT). Then I suggested that biodiversity can indeed be considered a system of autocatalytic sets. Successively, I argued that niche partitioning, as a way to coexist, could be a limited means to share the environmental resources and condition during evolutionary time. Therefore, I proposed that niche emergence is what mostly drives ecological diversity.

These research lines constitute the basis for the concept of ecological autocatalytic networks (ecoRAFs), how this can give rise to an expanding process of niche emergence (both in time



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and space), and how these networks have evolved over time (evoRAFs). This approach might be useful to estimate, with a power-law, the extent of extinction events and the “potential” number of species that could evolve in an ecosystem or in the whole biosphere. I am now exploring the deep implications of these novel ideas on evolutionary patterns and socio-economic theories.

The aim of the current research proposal is to evaluate and predict the effect of present and future global changes on biological diversity and analyze the implications of niche emergence and biodiversity autocatalysis on evolutionary developmental biology (Evo-Devo) and socio-economic aspects related to sustainability. I will attempt to address both a theoretical and empirical debate trying to provide an answer to three main interdisciplinary questions on the “unpredictability” and predictability of evolution, in terms of i) biodiversity expansion limits and biodiversity loss in the Anthropocene, ii) evolutionary developmental biology, and iii) economic growth.



**Christian DORNINGER**

(January 2020 – January 2022)

*Christian Dorninger is a postdoctoral research fellow at the KLI since January 2020. He has an interdisciplinary background spanning over social ecology, to sustainability science, sociology, and international development studies. His research interests include the development and application of methods of human-nature interaction, the sustainability transformation, resource use and decoupling, a biophysical perspective on trade relations, teleconnections, and ecologically unequal exchange.*

**Human Niche Construction in the Anthropocene:  
From Taming Nature to Taming Growth?**

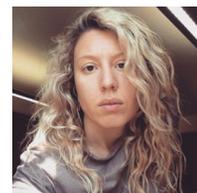
The global sustainability crisis has been described as a result of the uniquely human form of adaptability and niche con-

struction. Humanity has evolved to become a driving force of global environmental change and influences a substantial and growing part of natural ecosystem interactions and energy flows. At the same time, human distance to nature increased remarkably during the last decades due to processes of globalization and urbanization. The increasing biophysical disconnect between humans and nature effectively works to circumvent limitations and self-constraining feedbacks of natural cycles, which is a crucial feature of niche construction. In this project, I explore how increasing forms of human-nature disconnections can be grasped as a form of human niche construction where cultural innovations are set to circumvent self-constraining feedbacks by a temporal avoidance of direct consequences from the environment. However, the progressive industrial human niche construction ultimately threatens the very existence of future generations and of other species. Applying a niche construction perspective on modern human-nature disconnections has the potential to yield in truly new research insights which might help us to guide human-nature coevolution on a much more sustainable pathway.

### **Flavia FABRIS**

(January 2019 – May 2021)

*Flavia Fabris (PhD La Sapienza University of Rome) is a philosopher of biology who worked at Egenis, the Centre for the Study of Life Sciences, at the University of Exeter. Her background is in philosophy of science and evolutionary developmental biology. From 2011 to 2014, she worked at the La Sapienza, Department of Genetics and Molecular Biology "Charles Darwin," focusing mainly on epigenetic inheritance and the canalization of development. Since 2013, she has been associated with the Centre for Applied Philosophy of Science (CAPS) at the Norwegian University of Life Sciences (NMBU), Ås. Her research examines a variety of conceptual issues in evolutionary and developmental biology, with an emphasis on causation and on methodological and ontological aspects of scientific practice. At present, she is particularly inter-*





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*ested in re-examining the philosophy of cybernetics, its primary forms of reasoning, and its implications for theoretical biology, with particular regard to Evo-Devo and the Extended Evolutionary Synthesis.*

### **Rethinking Cybernetics in Contemporary Theoretical Biology**

In recent years, the contributions of cybernetics to the development of evolutionary developmental (Evo-Devo) biology have increasingly been recognized. The particular theories and models developed during the flourishing of cybernetics in the early 20th century laid the foundation for the systems approach, which is nowadays widely and fruitfully employed in molecular biology, genetics, genomics, immunology, developmental biology, and ecology. Nevertheless, in some quarters, scholars argue that cybernetics should be treated with suspicion because many evolutionary phenomena cannot be explained reductively in terms of mechanisms, their parts, and their production. This debate, almost a decade long, has produced a considerable amount of literature, mostly centred on the long-protracted dispute between mechanistic philosophers of biology on one side, and those who argue for the superiority of a process view of life on the other. My project aims to re-examine the philosophy and epistemology of cybernetics, its history and its implications for contemporary theoretical biology. The philosophical analysis will focus on clarifying the epistemologies of both cybernetics and Evo-Devo biology, and determining how and to what extent they overlap. I aim to provide positive arguments for the conclusion that, in contrast to the predominant view, cybernetic explanations within biology, when properly understood, are a form of non-reductionist explanation. My work will also help to evaluate the general assumption that cybernetics has, at its ground, a metaphysical commitment to the mechanistic nature of life. I will put this assumption in question, and therefore suggest that the suspicion mentioned above is misplaced.

**Ivan Dario GONZÁLEZ CABRERA**

(March 2018 – February 2020)



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*Ivan D. González Cabrera completed his PhD in philosophy at the Australian National University supervised by Professor Kim Sterelny. He has been a research student in Professor Yoshiyuki Hirono's lab at the University of Tokyo and research fellow at the Max Planck Institute for Evolutionary Anthropology under Professor Michael Tomasello's supervision. He was a writing-up fellow at the KLI in 2016. His research focuses on the intersection between biology and psychology, and their philosophical implications. Most of his previous work has been concerned with issues about normative cognition, with a secondary interest in causal and physical cognition. As a KLI post-doctoral fellow, he is currently working on normative disagreement and its role in the emergence of large-scale cooperation and cultural complexity in humans.*

**The Role of Normative Disagreement in the Emergence of Large-Scale Cooperation and Cultural Complexity in Humans**

The proposed research focuses on the evolution and development of normative disagreement and its relation to the emergence of large-scale cooperation and cultural complexity. Normative disagreement is an understudied cause of cultural complexity via norm diversification. It leads to both opposing norms that govern the same aspects of our lives as well as norms that govern different aspects of it such as moral, religious, political, and epistemic norms. Human norm-psychology is often seen as a key driver of large-scale cooperation in our lineage. But large-scale cooperation is constantly threatened by normative disagreement, whether moral, religious, political, or epistemic. In this project, I aim to understand the evolutionary and developmental roots of these kinds of disagreement, the proximal mechanisms responsible for handling them, and the consequences that the underlying psychology of moral disagreement had for the expansion of cooperation in large, culturally complex societies.



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### Nicole Dienneke Sybille GRUNSTRA

(September 2019 – August 2021)

*Nicole Grunstra is a biological anthropologist and evolutionary morphologist, with a strong background in human evolution and functional, ecological, and evolutionary morphology of primates and other mammals. She furthermore has strong skills in 3D geometric morphometrics and digital imaging techniques, developed during her time at the University of Vienna. Central to her work is her passion for comparative morphology and natural history collections, as well as a fascination with macroevolutionary patterns of trait evolution and their relation to microevolutionary processes and developmental constraints. In line with this, Nicole frequently applies Evo-Devo concepts in her work and is well-versed in phylogenetic comparative methods and multivariate statistics.*

*Nicole obtained her PhD in biological anthropology from the University of Cambridge. In her dissertation, she investigated the spatio-environmental correlates of the taxonomic, phylogenetic and phenotypic divergence of macaques (Primates: Cercopithecidae) in Asia, using phylogenetic comparative, morphometric, and multivariate methods.*

*Nicole's recent postdoc work (at the University of Vienna) includes the decomposition of organismal form into components of variation at different spatial scales, which differentially preserve phylogenetic history, adaptation and compensatory growth.*

*At the KLI, she developed her own line of research on human pelvic evolution and the evolution of difficult human childbirth in both an evolutionary medicine and a phylogenetic comparative framework. Together with her collaborators from the University of Vienna, she found support for the "pelvic floor hypothesis" of human pelvic evolution that predicts a trade-off between childbirth and pelvic floor support in the human bony pelvis. Her comparative morphological work includes a recent pub-*

*lication on the similarities and differences in pelvic sex differences in humans and chimpanzees. She also studies obstetric adaptations in the pelvic morphology of bats (Chiroptera), which give birth to young that weigh 10-45% of maternal body weight depending on the species – much larger than human babies!*

*She recently also continued her work on primate ecomorphology and biogeography in a collaboration, going more in-depth in the relationship between taxonomic and morphological differentiation and past biogeographic and climatic changes in Southeast Asia*

*Her theoretical interests include the definition, usage and detection of phylogenetic “constraints”, phylogenetic “effects”, and phylogenetic signal, as well as the utility and shortcomings of explanatory frameworks in biology of “ultimate” vs. “proximate” explanations, Tinbergen’s Four Questions, and the notion of “reciprocal causation” of the Extended Evolutionary Synthesis.*

### **Towards Resolving the Human Obstetric Conundrum: Theoretical, Computational, and Comparative Mammalian Approaches**

Childbirth in humans is difficult compared to most other mammals. There is a high risk of mortality and morbidity to both, mother and baby, associated with childbirth arising from the tight fit or mismatch between the size of the baby and the maternal birth canal. So why has the human birth canal not evolved to be wider? This ‘obstetric conundrum’ has long been debated and several explanations have been advanced. However, explanatory factors are manifold, interact, vary among human populations, and often pertain to different levels of explanation, impeding our understanding of this conundrum and attempts to resolve it. To help overcome this challenge, a theoretical framework is required, grounded in evolutionary theory and integrating principles from developmental and evolutionary biology, which helps to reconcile different levels of explanation and identify methodological challenges and outstanding questions pertaining to the obstetric conundrum.



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Furthermore, few evolutionary hypotheses exist of why the human pelvis evolved to be relatively narrow, and the ones that do have received little empirical attention. One in particular, the pelvic floor hypothesis, will be the focus of applied research. Using numerical finite element simulations, the pelvic floor will be modeled as an idealized membrane and subjected to sensitivity analysis to establish the relationship between membrane geometry and its level of deformation. Lastly, not only pelvic size and shape are relevant for childbirth; the degree of mobility at the pelvic joints can also facilitate or hinder easy passage of the fetus through the birth canal. Mammals document a range of pubic symphysis morphologies, reflecting a combination of adaptations and constraints related to positional behavior, birth, and phylogeny, the study of which can yield valuable insight into the human condition.



### Alice LACINY

(February 2019 – October 2021)

*Alice Laciny is a former PhD student at the Department of Theoretical Biology at the University of Vienna and recently completed her thesis in the course of the WWTF project “Voluntary self-sacrifice in exploding ants: a mechanism to defend coevolved microbiomes?” at the Natural History Museum Vienna. She has been fascinated by insects from an early age and recently became president of the Austrian Entomologists’ Association. Her scientific interests include myrmecology, parasitology, evolutionary developmental biology, and caste-characterization of social insects via morphological, statistical, and behavioral methods. Her postdoc work focuses on the influence of parasites on the morphology of ant hosts. Her current project at the KLI aims to review the body of current literature on this topic and highlight the overlapping aspects of ecology, evolution, and ontogenetic development therein.*

## Eco-Evo-Devo in Action: Parasite-Induced Morphologies in Ants

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Ant colonies can harbor a large number of diverse parasites and pathogens, many of which are known to induce phenotypic changes in their hosts. Although hitherto largely overlooked in the context of ecological evolutionary developmental biology, the study of parasitogenic morphologies can shed light on mechanisms and pathways relevant to the ontogenetic development of the host, their plasticity or robustness under environmental perturbations, as well as evolutionary and ecological consequences for the host. Within my postdoctoral fellowship at the KLI, I plan to assess the current body of scientific literature regarding parasite-induced morphological changes in ants. I aim to compile and publish a review article on parasite-induced morphological aberrations in the family Formicidae, within which I will compare previously described host-parasite systems and assess commonalities and differences of different parasitogenic phenotypes and their underlying developmental mechanisms. I will interpret my findings in light of current theories, especially from the field of (Eco)-Evo-Devo, and identify systems suitable for further study. This will lay the groundwork for an international, interdisciplinary project researching host-parasite interactions and parasitogenic phenotypes in ants.

### Lumila MENÉNDEZ

(September 2018 – August 2020)

*Lumila Menéndez is a bioanthropologist, with a BA in anthropology, and a PhD in natural science, both from the University of La Plata. During her PhD she contributed to discuss the strong impact that nutritional components have on the cranial shape of South American populations. She was a postdoctoral fellow at University of Tübingen, where she studied the skeletal pattern of the earliest Andean populations living*





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*at highlands. Her main research interest is human evolution, specifically the peopling and concomitant morphological diversification of South America. She investigates this with a particular focus on the impact of non-random factors on the skeleton.*

### **Influence of Diet on Human Face and Mandibular Variation**

The face and mandible have been described as the two cranio-mandibular modules with the strongest environmental influence. Moreover, due to the prominent functional role that they have during chewing, it was suggested that diet mostly contribute to shape them. Most previous studies describe these modules independently, using either a local or a worldwide approach, and evaluating diet qualitatively. As a result, it is not clear the differential role that diet might have played on shaping the facial and mandibular variation during human evolution, while diet diversity is reduced and simplified, thus avoiding its multifactorial complexity. In contrast, in the present project, I propose to analyse diet as a continuous quantitative variable, and also to evaluate the degree of association between diet diversity, facial, and mandibular variation, in order to address the differential influence that diet might have had on shaping craniofacial variation in humans. For this, I will use two morphometric databases, a worldwide sample, and a local one from the Argentinean Pampas that spans through the Holocene (9,000-500 years BP). In addition, I will estimate bite force, collect  $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ , archaeological and ethnographic data, which will be used to quantitatively characterize diet, thus incorporating quantitative independent variables into the statistical model. It is expected to build a more suitable method for studying the influence of ecology on the skeleton. Therefore, this project would contribute to the on-going debate on the influence of ecological factors on humans' skeleton, whose interpretations could be extended to the fossil record.

**Luana POLISELI**

(September 2020 – August 2021)

*Luana Poliseli holds a PhD in history, philosophy, and science teaching. She worked as a researcher at the National Institute of Science and Technology / Inter- and Transdisciplinary Studies in Ecology and Evolution (INCT/ INTREE) of the Federal University of Bahia (UFBA). She is also a researcher involved in the ERC project 'Local Ecological Knowledge' coordinated by David Ludwig of the Wageningen University.*



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**Ecological Understanding as Key to Improve Sustainability Sciences**

Due to the aggravation of environmental problems, scientists are called to develop solutions for a sustainable future. Part of the models scientists develops to explain these problems rely strongly on visual representation in order to strengthen their intelligibility. According to the contextual theory of scientific understanding, the more intelligible a model, the bigger the chances to achieve understanding. This project aims to answer how can ecological understanding be improved through visual representations? This question will be tackled interdisciplinarily between philosophy, ecology and aesthetics. If one of the epistemic goals of science is to explain and understand phenomena, to acquire a good philosophical knowledge about ecological understanding is of utmost importance to improve a sustainable world.



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**Marco Paulo VIANNA FRANCO**

(October 2020 – September 2021)

*Marco 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.

## 2.4 Senior Fellowships

### Roberto CAZZOLLA GATTI

(January 2021 – April 2021)



*Roberto Cazzolla Gatti is an Italian environmental and evolutionary biologist, and a biodiversity expert, who studies the diversity, behaviour, evolution, and ecology of species on Earth. He is an associate professor and the head and scientific coordinator of the MSc program in biodiversity at the Biological Institute of the Tomsk State University, Russia.*

*He also works as a freelance documentary photographer and wildlife filmmaker and coordinates geographic and scientific explorations of some of the most remote places on Earth. In 2019, his documentary-film on the biodiversity of Congo river basin's forests entitled "Ivindo: a journey into the green heart of Africa" was released by the Colibrì Studio Productions.*

### **The Role of Niche Emergence and Diversity Autocatalysis in the Evolution of Biodiversity, Socio-Economic Sustainability, and Developmental Biology**

There are few studies and theories that clearly explain why the number of niches is so variable through ecosystems and how can several similar species live in the same environment. In my early work, I showed that the number of niches in an ecosystem depends on the number of species extant in a particular time and that the species themselves allow the enhancement of niches in terms of space and number. I firstly resumed these hypotheses, after some empirical studies, in the Biodiversity-related Niches Differentiation Theory (BNDT). Then I suggested that biodiversity can indeed be considered a system of autocatalytic sets. Successively, I argued that niche partitioning, as a way to coexist, could be a limited means to share the environmental resources and condition during evolutionary time. Therefore, I proposed that niche emergence is what mostly drives ecological diversity.



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These research lines constitute the basis for the concept of ecological autocatalytic networks (ecoRAFs), how this can give rise to an expanding process of niche emergence (both in time and space), and how these networks have evolved over time (evoRAFs). This approach might be useful to estimate, with a power-law, the extent of extinction events and the “potential” number of species that could evolve in an ecosystem or in the whole biosphere. I am now exploring the deep implications of these novel ideas on evolutionary patterns and socio-economic theories.

The aim of the current research proposal is to evaluate and predict the effect of present and future global changes on biological diversity and analyze the implications of niche emergence and biodiversity autocatalysis on evolutionary developmental biology (Evo-Devo) and socio-economic aspects related to sustainability. I will attempt to address both a theoretical and empirical debate trying to provide an answer to three main interdisciplinary questions on the “unpredictability” and predictability of evolution, in terms of i) biodiversity expansion limits and biodiversity loss in the Anthropocene, ii) evolutionary developmental biology, and iii) economic growth.



### **Daniel J. NICHOLSON**

(September 2018 – September 2020)

*Daniel J. Nicholson holds Master's degrees in molecular and cellular biology (University of Bath) and in history and philosophy of science (University of Leeds). In 2010, he obtained his PhD in philosophy (University of Exeter). His doctoral thesis presented a critical examination of mechanistic thinking in biology. He is particularly interested in the role of machine models in biological explanations, in the task of providing a naturalistic account of organismic purposiveness, and in philosophical arguments for the autonomy of biology.*

*He also has a longstanding interest in the history of theoretical biology. Daniel was a postdoctoral fellow*

*at the KLI, a research fellow at the Cohn Institute for History and Philosophy of Science and Ideas of Tel Aviv University, and a research fellow at the Centre for the Study of Life Sciences (Egenis) of the University of Exeter.*

### **The Organism Reconsidered**

This project aims to provide a new theoretical understanding of the nature of the organism. Taking the machine conception of the organism as its critical target, the project will elaborate an ontological conception of life that highlights its intrinsically purposive self-maintaining organization. It will also consider the implications that such non-mechanical – yet scientifically-grounded – understanding has for how living systems should be studied and explained, and more generally for how the epistemic relation between biology and the physical sciences should be construed. This novel philosophical outlook on organisms will be developed by drawing on a virtually forgotten school of biological thought known as ‘organicism,’ which came to prominence between the First and Second World Wars, but which subsequently became marginalized following the rise of molecular biology. By revisiting the organicist tradition and updating its core ideas, the project will not only reshape current theoretical views regarding the nature of life, but also restore organisms to their rightful place in the edifice of biological theory. In the process of doing so, the organism-centred perspective developed in the project will be used to address a number of highly topical issues in the philosophy of biology. Overall, the project will demonstrate that, despite all efforts to consign it to the dustbin of history, organicism has never been more relevant than it is today. The main output of the project will be an extended monograph with MIT Press, which will eventually appear as part of the Vienna Series in Theoretical Biology.



## Orsolya BAJER-MOLNÁR

(February 2020)

*Orsolya R. Bajer-Molnár is an evolutionary biologist, with a passion for both research and education. She received her Master's diploma from Eötvös Loránd University in evolutionary biology, ecology and systematics. Five years later, she completed her PhD in behavioural ecology and evolutionary biology. She then won a postdoctoral scholarship at Dartmouth College, NH, after which she continued research at UFRN in Brazil. Upon returning, she turned towards the evolutionary dynamics of emerging infectious diseases, which she is currently working on in collaboration with the University of Nebraska and Centre for Ecology Research (Hungary).*

*Throughout her research, she had always been interested in science communication. Overseas she organized networking events, conferences and outreach programmes, and taught graduate and undergraduate students. She took an active role in science communication, and after numerous appearances she just recently gave a TedX talk. Her aim is to increase the visibility of research, and thus facilitate a combined effort to prevent the emerging infectious diseases.*

### Who's Next? – The Evolution of Emergence

2015 saw a worldwide epidemic sweep through South-America, leaving 3500 microcephaly and 4500 Guillain-Barré patients in its wake. As a result of these events, Zika qualified as an Emerging Infectious Disease within the same year. However, the surprising aspect of the Zika outbreak was that the virus had been known since its discovery in the 1940s, and was consistently described it as a low-risk pathogen with mild symptoms and zero mortality. So what changed in 2015, why did a seemingly harmless virus suddenly adopt neuroinvasion

in mass numbers? And how did it spread through three continents within a year? Although numerous studies have since been launched to develop the proper vaccine, to identify the molecular structure of the virus and to further study its physiological effects, certain questions were not raised. Where did it come from, why did the outbreak happen in that particular region, and where is it now?

Can it cause a new outbreak, will it make it to Europe, and are there other pathogens similar to it? We started out by searching for answers to the 'how' and 'why' by analyzing evolutionary models and host-parasite dynamics. But in the process of finding the causes, we had stumbled upon issues that risk both implementing results and initiating future studies.

### **Stanislava EISOVÁ**

(January 2020)

*Stanislava Eisová holds a Master's degree in anthropology of past populations from the University of West Bohemia, Czech Republic. She is pursuing a PhD in anthropology and human genetics at the Faculty of Science of the Charles University, Prague. Her project is on craniovascular traits, anthropology, paleoanthropology, and paleopathology. She investigates craniovascular characters in normal samples, pathological conditions, and fossil specimens.*



### **Craniovascular Traits in South America Populations**

This proposal concerns conducting research of the cranial anatomy in modern humans, focusing specifically on the functional morphology of particular craniovascular elements. The vascular system of the human head includes several interconnected structures; and some of them can be studied on dry skulls (Pířová et al. 2017). Middle meningeal vessels and dural venous sinuses leave their imprints in the



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inner surface of cranial bones, diploic veins create traces in diploe within bone matrix, and emissary veins pass the endocranial and ectocranial space through cranial foramina (e.g., Hershkovitz et al. 1999; Bruner & Sherkat 2008; Pířová et al. 2017). The anatomy and morphology of these structures vary among modern humans and hominins (e.g., Bruner & Sherkat 2008; Eisová et al. 2019). Cranial deformities and cultural modifications of the skull may also alter the development of craniovascular traits (Dean 1995; O'Loughlin 1996). The aim of the current project is to evaluate the influence of altitude on the variation and expression of craniovascular traits in a sample of South American populations. The study is based on cooperation with KLI fellow Dr. Lumila Menéndez, who will provide material for the research, participate in its design, as well as contribute with the interpretation related to the evolution and variation of South American specimens.



### **Sarah ELTON**

(March 2020)

*Sarah Elton is professor of evolutionary anthropology at Durham University. She previously held posts at the University of Kent and the Hull York Medical School. Her research focuses on morphological variation and evolution in Old World monkeys, with a particular interest in geographic and ecological influences on form. Sarah trained as a biological anthropologist and as result of her time working in a medical school also has an active interest in evolutionary perspectives on medicine, especially nutrition. For several years she was co-Editor in Chief of the Journal of Human Evolution (JHE) and currently serves as Associate Editor of JHE, Evolutionary Anthropology, the Journal of the Royal Anthropological Institute and Primate Biology.*

## Macaque Variation: Local Adaptation or Plasticity?

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Macaques (Old World monkeys of the genus *Macaca*) are widespread across Asia and found in relict populations in northern Africa. Today represented by over 20 species, *Macaca* evolved in Africa in the late Miocene and dispersed into Eurasia, probably initially around the Mediterranean, colonising Europe to ~53°N, and much of tropical and subtropical Asia plus some of its temperate regions. Some modern species are found in small geographic areas but others are spread over huge geographic ranges. The crab-eating (or long-tailed) macaque, *Macaca fascicularis*, is one such species, distributed across southeast Asia, from Bangladesh to Indonesia and the Philippines. Although *M. fascicularis* populations are declining, the species is classed as Least Concern in the IUCN Red List, and occupies a large number of different forested and shrubland habitats. I will report on work in progress with colleagues at the KLI that aims to quantify the morphological diversity in *M. fascicularis*, using a large geometric morphometric database of macaque skulls. Our ultimate aim is to determine whether morphological variation occurs because of phenotypic plasticity, or whether *M. fascicularis* specimens from the same geographic area (as a proxy for population) show evidence of local adaptation. The study of plasticity (expression of different phenotypes in different environments) versus local adaptation (genetic divergence) has been a fruitful area of botanical research, and we are excited to apply it to the fascinating macaques. By doing so, we hope to contribute to conservation efforts by gaining a better understanding of macaque diversity and the processes by which it arises.



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**Ioan FAZEY**

(February 2020)

*Ioan Fazey is professor of the social dimensions of environment and change at the University of York. He has over 65 research publications in knowledge, learning, resilience, vulnerability, sustainability and how to support societal transformations. His work has included innovative projects on community resilience in the South Pacific and Scotland, co-creative projects to build flood resilient floating homes in Bangladesh, and helping facilitate conversations about how to transform responses to rapidly rising sea levels in Louisiana. He is actively involved in helping support and facilitate emergence of a growing field of research and practice related to transformations to sustainability. This includes convening the Transformations Conference Series and being a co-founder of the SDG Transformation Forum. He is also a trustee of H3Uni, an action oriented organisation seeking to promote transformative thinking and capacity for working within a changing world. To find solace from a turbulent world and help him foster inspiration and support he spends time connecting with the non-human world, including with his dog.*

**Knowledge Systems for Sustainability**

Humanity and the planet are entering a period of major, transformative change in economies, political power, human-environment relationships and technology. Whether for the good or for the bad, transformation of society is, in some way, inevitable. Humanity has therefore no option other than to try and find ways to help steward such transformations towards more equitable and sustainable futures. While science and knowledge have an important role to play in this process, these are arguably failing humanity when its impact is measured against the level of progress being made towards addressing burgeoning global environmental and social crises. For all its brilliant success, science, research, and technology



have also led to many of the problems to which transformative responses are now needed, including climate change, obesity, smoking, mental health, plastics in the oceans, and premature deaths from air pollution. This raises important questions about the kinds of knowledge and learning needed for, and in, a transforming world.

This visiting fellowship explores some of these issues, highlighting that, in the world of 21st century challenges in which we find ourselves, nothing can be taken for granted. In effect, we are all apprentices and need to rapidly develop new ways of approaching problems. In relation to knowledge we need to accept we are all apprentices; draw on much more diverse forms of knowledge; develop wisdom about how to act in the world, not just knowledge; and unleash creativity and possibilities. This raises challenges not just for the way knowledge is produced, but also for the systems and structures supporting it. It also requires asking difficult existential questions about who we should be at the end of the world as we know it.

### **Laurent LOISON**

(January 2020)

*After a full training in biology (University of Strasbourg), I turned to history and philosophy of science and defended in 2008 a PhD at Nantes University. I am presently a full-time junior researcher at the CNRS, working in Paris in the Institute of History and Philosophy of Science and Technology (IHPST, Sorbonne).*

*My researches are devoted to some conceptual aspects of the history and philosophy of the scientific fields that allow the autonomy of biology: the evolutionary theory, the cell theory, and molecular biology. My main interest is in Lamarckism (broadly speaking) and the concept of inheritance of acquired characters. My PhD dissertation explored the complex history of Lamarckism in the French context. I am now mostly involved in the*





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*conceptual clarification of two conflated evolutionary mechanisms: the Baldwin effect and genetic assimilation in order to enrich the scientific and philosophical debate regarding the possibility of an Extended Evolutionary Synthesis.*

*I am also interested in the issue of the articulation of history and philosophy of science. Most of my contribution regards the problem of "presentism" and the way it might be possible to renew the aim and scope of what is usually termed 'historical epistemology' (continental philosophy of science).*

### **Cybernetics and the Rise of Molecular Biology: The Case of Jacques Monod**

How cybernetics shaped the nascent molecular biology is still an issue that has to be address in detail, both philosophically and historically. The only substantial account remains Lily Kay (2000) "Who Wrote the Book of Life?," and since then, there was only a very few studies that explore the role of cybernetics in the rise of molecular biology.

The aim of this visiting fellowship is to show how central cybernetics was in the work of Jacques Monod. This centrality is usually neglected in the reconstruction of what happened at the Pasteur Institute, the importance of cybernetics being reduced to only the use of the vocabulary of "information." On the basis of published and unpublished texts, I will show that cybernetics was a much more significant and long-lasting intellectual resource for Monod. As soon as the second half of the 1950s, he thought of the cell as a cybernetic system to such an extent that he wrote an unpublished book entitled "Cybernétique enzymatique." The birth of the operon model, in close collaboration with François Jacob, has made less visible his cybernetic palatability. Yet, cybernetics was still an important part of the model, as some diagrammatic representations obviously testify. It is again cybernetics that was at the core of his 1965 concept of "allosteric transitions," that Monod himself considered as his greater scientific achievement. Last but not least, in "Chance and Necessity" (1970), Chapter 4 is still entitled "Cybernétique microscopique."

Thus, from the 1950s to the early 1970s, cybernetics appears to be an inescapable intellectual intention for Monod. This fellowship will explore the philosophical dimension of this cybernetics quest from both the 1960s viewpoint and our contemporary perspective.

### **Hari SRIDHAR**

(February – March 2020)



*Hari Sridhar is a post-doctoral researcher at the National Centre for Biological Sciences, Bangalore, examining the intersection of science and conservation in India. Over the last 4 years, Hari has been conducting interviews with authors of classic papers in ecology, evolution and behaviour, which he posts on the blog <https://reflection-sonpaperspast.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 teaches ecology and ornithology at various research institutes and colleges in India, and is an editor of the Current Conservation magazine.*

### **Naeem Revisits Naeem et al. 1994: Reading between the Lines of a Scientific Paper**

Writing scientific papers is, arguably, the most important task in a scientist's working life. Papers are the universal currency by which scientists are compared and evaluated. For most scientists, papers will be the only scientific legacies they leave behind. Unfortunately, scientific papers are imperfect records of scientific activity. Papers present a cleaned-up, simplified and reorganized version of the scientific process, leaving out any detail that might distract the reader from understanding the paper's findings. In addition, although a



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paper is “true” when published, its truth diminishes with time, as new knowledge emerges that questions its claims. Finally, a paper can take on entirely new, unintended and possibly erroneous meaning, when it is cited by other papers. One might even say that words are put in its mouth!

Since June 2016, in an attempt to provide a more realistic documentation of the scientific process, I have conducted 153 interviews (+20 still in progress), each based on a famous paper in ecology, evolution or behaviour. In these interviews, I ask the lead author of the paper questions about: 1. the making of the study and paper; 2. the current validity of the paper’s findings and conclusions; 3. the impact the paper has had on subsequent research and the author’s own career.



### Frank ZACHOS

(June 2020)

*Frank E. Zachos studied biology, history of science, and philosophy and is presently head of the Mammal Collection at the Natural History Museum Vienna and affiliated professor at the Department of Genetics at the University of the Free State in Bloemfontein, South Africa. His biological research focuses on the intraspecific biodiversity, population genetics, biogeography, and conservation of mammals and birds. His main theoretical interests comprise species concepts and the species problem, the foundations of taxonomy and systematics and the history and philosophy of evolutionary biology.*

### **The Species Problem – the Metaphysics / Ontology of Species and Its Bearing on Comparative Biology**

Ever since my undergraduate studies, I have had an interest in the history and philosophy of my main study subject – biology. The species problem is one of the most-debated topics in biology, and there is hardly one that combines history, philosophy and evolutionary biology more than the species problem does, which is why I have been drawn to it for a long time.

Working as a research scientist in a natural history museum, taxonomy, ie the description and quantification of biodiversity and how these translate into names of (ideally) real biological entities, is one of my main scientific activities, and the theoretical underpinnings of these activities are largely determined by issues related to the species problem. The species problem deals with questions on the ontological status of species taxa, whether the species category is real or only exists nominally, and the theory and practice of delimiting species. While this is often very theoretical and philosophical, the practical ramifications could not be more relevant to large parts biology and beyond. The species is the most commonly used currency in many realms of comparative biology, from macroecology to evolutionary biology, and it is also by far the most important unit in conservation biology and management. If it turns out that the species rank (i.e., the species category) is not objectively real – and that is unfortunately rather likely –, many if not most of the quantitative analyses using species counts and species taxa are seriously flawed.

As part of my ongoing work on the species problem, I am now collaborating with two colleagues (John Wilkins, a historian and philosopher of science, and Igor Pavlinov, a Russian biologist) on an edited volume on the species problem. The idea of this book is to give an updated account in the spirit of a 1999 volume edited by Robert A. Wilson (*Species – New Interdisciplinary Essays*). Over the last 20 years, many new ideas have been published, including exciting conceptual work on epistemology and psychology pertaining to how we perceive species. We are aiming at a new synthesis of the historical, philosophical and biological dimensions of the species problem. During my stay at the KLI I would work on and discuss selected issues of this project.



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## 2.6 Researchers with Own Funding

### Luis Alejandro HERNÁNDEZ VILLANUEVA

(September 2018 – April 2020)

*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).*

*He is a PhD candidate in philosophy of science in the Institute for Philosophical Research at the National Autonomous University of Mexico. From January to June 2016 he did his PhD 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 explores 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.*

### The Origins of Musical Behavior as Co-Evolution of Cognitive Capacities of Social Interaction

According to niche construction perspective, the aim of this project is to develop a theoretical model to explain the origins

of cognitive musical capacities not committed to the task of identifying one crucial cause (natural selection, sexual selection, genetic inheritance, brain architecture, pleasure production, or any other) that occurred in a specific period of time to solve a particular survival issue. Instead, it will be argued that cognitive musical capacities may have evolved as part of interdependent and intertwined bio-cultural processes that enhanced the evolution of our cognitive capacities for basic social interaction over the development of our hominin lineage.

### **Lumila MENÉNDEZ**

(September – December 2020)

*Lumila Menéndez is a bioanthropologist, with a BA in anthropology, and a PhD in natural science, both from the University of La Plata. During her PhD, she contributed to discuss the strong impact that nutritional components have on the cranial shape of South American populations. She was a postdoctoral fellow at University of Tübingen, where she studied the skeletal pattern of the earliest Andean populations living at highlands. Until August 2020, she held a KLI postdoctoral fellowship. Her main research interest is human evolution, specifically the peopling and concomitant morphological diversification of South America. She investigates this with a particular focus on the impact of non-random factors on the skeleton.*



### **Influence of Diet on Human Face and Mandibular Variation**

The face and mandible have been described as the two cranio-mandibular modules with the strongest environmental influence. Moreover, due to the prominent functional role that they have during chewing, it was suggested that diet mostly contribute to shape them. Most previous studies describe these modules independently, using either a local or



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a worldwide approach, and evaluating diet qualitatively. As a result, it is not clear the differential role that diet might have played on shaping the facial and mandibular variation during human evolution, while diet diversity is reduced and simplified, thus avoiding its multifactorial complexity. In contrast, in the present project, I propose to analyse diet as a continuous quantitative variable, and also to evaluate the degree of association between diet diversity, facial, and mandibular variation, in order to address the differential influence that diet might have had on shaping craniofacial variation in humans. For this, I will use two morphometric databases, a worldwide sample, and a local one from the Argentinean Pampas that spans through the Holocene (9,000-500 years BP). In addition, I will estimate bite force, collect  $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ , archaeological and ethnographic data, which will be used to quantitatively characterize diet, thus incorporating quantitative independent variables into the statistical model. It is expected to build a more suitable method for studying the influence of ecology on the skeleton. Therefore, this project would contribute to the on-going debate on the influence of ecological factors on humans' skeleton, whose interpretations could be extended to the fossil record.



### Stephanie SCHNORR

(September 2018 – March 2021)

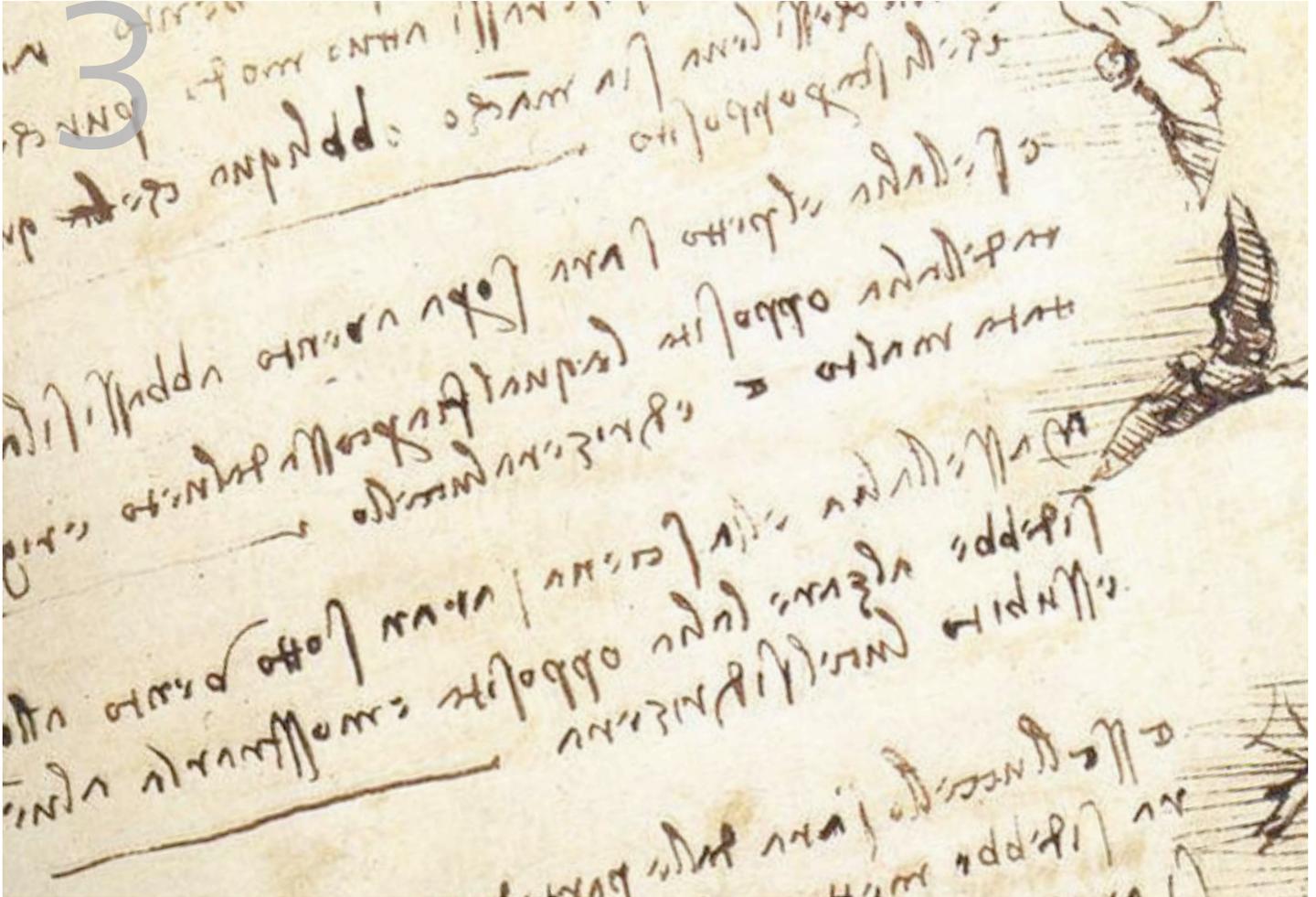
*Stephanie is a biological anthropologist interested in understanding the dietary landscape accessed by human ancestors that enabled the evolution of large brains and complex cognition. During her PhD she worked with the Hadza of Tanzania to investigate food acquisition and processing behaviors in how these alter the digestibility of plant food resources, mainly underground storage organs, or tubers. Through her research on digestion, Stephanie became interested in understanding the role of the gut microbiota in human nutritional acquisition, particularly in consideration of human foragers who often rely on refractory plant resources that are high*

*in fiber. Her research ranges from work on reconstructing ancient microbiomes from human tissue to ethnographic modeling of food processing in understanding the dietary flexibility of present day humans. Stephanie Schnorr was a postdoctoral associate at the Oklahoma University and a KLI postdoctoral fellow. In September 2018, she was awarded a fellowship of the US National Science Foundation (NSF) and now works as an NSF fellow at the KLI on her project 'Relevance of Positive Selection on Human Salivary Amylase Gene.'*

### **Physiological Relevance of Salivary Amylase**

Human salivary alpha amylase (sAA) is the most abundant protein found in saliva. The expression of sAA is regulated by copy number variation (CNV) of the AMY1 gene, and the enzyme is responsible for the breakdown of starch into simple sugars. We lack specific knowledge as to how changes in sAA concentration impacts starch digestion during mastication or through downstream regulatory effects. Importantly, no empirical research exists that explores rate variation in the hydrolysis of raw versus cooked starch. Using a controlled in-vitro and histological approach along with human subject validation trials, I intend to address questions about the starch degrading activity of sAA in the mouth, and the potential nutritional advantages brought about by a selective increase in AMY1 CNV in human evolutionary history. These questions address diet related selective events that occurred along human evolutionary history. Understanding the resulting nutritional benefits and potential susceptibilities to metabolic and inflammatory disease promises not only resolution of our distinctly human traits but also advances towards evolutionarily-informed models of targeted therapies. This project uses a multidisciplinary approach to tackle relevant questions in the field of anthropology and human evolutionary research.

## 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 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.



**1<sup>st</sup> Working Group**  
**25 March & 1 December 2020**

**Evolutionary Theories for  
 Social-Ecological Change**  
 KLI, Klosterneuburg, online

Organization: Tim Waring & Maja Schlüter

#### Topic and Aims

Both human evolutionary theory and SES share common interests in the dynamics and complex causes of human-environment interactions. On the one hand, bringing in evolutionary theorizing can help provide a unifying framework to find common patterns across diverse cases. On the other, SES work on the place of humans in biospheres offer concrete, empirical cases and points of connection with action-oriented interventions. Some approaches are deeply empirical while others are abstract and theoretical. These diverse approaches can all gain from navigating their respective languages, case studies, as well as conceptual and modeling tools to develop collaborative work that address pressing real-world problems, aka “theory that matters.”

The hope for accelerating interdisciplinary integration also comes with welcomed creative tensions. How can we recognize which theories to adopt and use? How can we create true novelty and develop theoretical frameworks and empirical approaches that are actually useful and matter? How can we facilitate an organic, bottom-up emergent collaboration? How can we be reflexive in the process?



## 54 Participants

MONIQUE BORGERHOFF-MULDER, Max Planck Institute for Evolutionary Anthropology, Leipzig

THOMAS CURRIE, University of Exeter

CARL FOLKE, Stockholm Resilience Center, Beijer Institute, RSAS

LAUREL FOGARTY, Max Planck for Evolutionary Anthropology, Leipzig

JAMILA HAIDER, Stockholm Resilience Center

PETER JØRGENSEN, Beijer Institute of Ecological Economics, Stockholm

ALESSANDRO TAVONI, University of Bologna

## 3.2 Summer School



### European Advanced Seminar in the Philosophy of the Life Sciences (EASPLS)

7-11 Sept 2020

#### Mentoring Sessions

*KLI, Klosterneuburg, online*

*Organizers: Guido Caniglia, Marcel Weber*

#### Program

PHILIPPE HUNEMAN

University of Paris 1

**Creative Misunderstandings and Legitimacy: From Conversation to Collaboration between Scientists and Philosophers**

FEDERICA RUSSO

University of Amsterdam

**Fostering Epistemic Diversity in Science and Philosophy**

MAËL LEMOINE, THOMAS PRADEU

University of Bordeaux

**Philosophy in Science: Why Is It so Difficult to Infiltrate Science?**

MARCEL WEBER

University of Geneva

**Pursuing a Career in Philosophy of the Life Sciences**

THOMAS REYDON

University of Hannover

**Building a Career between Disciplines**

GUIDO CANIGLIA

Konrad Lorenz Institute for Evolution and Cognition Research

**Learning to Collaborate while Collaborating across Disciplines**

GIOVANNI BONIOLO

University of Ferrara

**Which Role for Philosophy in the Life Sciences, and How Much Science Should We Know to Do Philosophy?**

SABINA LEONELLI

University of Exeter

**Publishing Challenges: Negotiating Interdisciplinarity and Open Access**

JON UMEREZ

University of the Basque Country

**Making Room for Epistemology in the Public Debates on Science and Technology**

ISABELLA SARTO-JACKSON

Konrad Lorenz Institute for Evolution and Cognition Research

**Careers Beyond Academia**

JOHN DUPRÉ

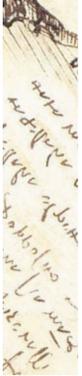
University of Exeter

**Life in the Philosophy of Science**

SARA GREEN

University of Copenhagen

**Teaching Philosophy of Science**



## 56 3.3 KLI Special Events

### Why are we doing this?

- **Getting to know each others'** projects, interests, approaches, skills.
- Presenting to a wide *interdisciplinary* audience
- Trigger some *unexpected* opportunities for *interactions*, *mutual learning*, and *cross-contamination*.

### Mini-Symposium of the KLI Fellows 10 November 2020

*KLI Klosterneuburg*

Organizer: *Guido Caniglia*

### Topic and Aims

On November 10th, the KLI hosted an internal mini-symposium of four minute flash/blitz presentations to introduce our fellows to each other. Instead of the usual presentation and Q&A format, Guido Caniglia developed a new method to foster genuine engagements and camaraderie.

The main problem with the usual format is that it's hard to pay attention to others when we're mentally preparing for our own presentations (sometimes quite anxiously). As a result, we tend to shut out the talks right before us. In a blitz, that would be a lot of people!

To mitigate this tendency in a gathering meant to foster mutual understanding/collaborations, Guido created a format that allowed to listen and think. After each talk, fellows sat together for a few quiet moments to actively write the speaker an email of appreciation. These quick emails highlighted points of resonation, connection, and possible collaboration. Ideally, these emails opened up further informal conversations.

To start the meeting, Guido invited all fellows to take a deep breath "to collectively arrive" in a moment of meditative silence. This allowed everyone to quietly adjust to the fact that, with zoom meetings early in the morning, many probably just climbed out of their beds.

While we don't have access to the wonderful synergies that arose from the follow-up conversations, we invite you to connect potential dots by taking a look at the profiles of our KLI fellows.



## SciComm Workshop 16 December 2020

### Sharing Science: Science Communication & Open Science in the Digital Age

KLI Klosterneuburg, online

*Organizers: Postdoctoral Fellows of the KLI*

*Lumila Menéndez, Nicole Grunstra, Alice Laciny, Stephanie Schnorr,  
Christian Dorninger, Orsolya Bajer-Molnár, Flavia Fabris, Marco Vianna Franco,  
Luana Polisei, Roberto Cazzolla Gatti*

### Topic and aims

Science communication ("Sci Comm") is becoming an increasingly relevant practice. Not only does it improve the exchange of information between scientists and the general public, stakeholders, policy makers, and other academics, it also increases the visibility of research programmes. While some decades ago it was mostly carried out by a small number of scientists and science-journalists, Sci Comm is now a growing academic field involving experts coming from different backgrounds.

Aim of the workshop was to learn how to communicate science broadly and effectively. This pertains to choosing an appropriate medium and outlets for science communication and accessing the professional domains of science journalism for knowledge about strategies in promoting one's research. This assumes that the priority is to establish a dialogue that allows academics and journalists to efficiently work together and to both be satisfied by the outcome. A fruitful collaboration between scientists and science communicators will contribute to empowering meaningful actions to address some of the society's biggest challenges.

### Speakers

MAX AUBRY (Co-Organizer for Pint of Science Austria events)  
ANN GIBBONS (Contributing Correspondent for Science magazine)  
CHRISTINE HOEKENGA (Environmental Educator for Pima County)  
IVA KOSTADINOVA (Public Relations Officer at Pensoft Publishers)  
SHAWNA WILLIAMS (Senior Editor at The Scientist Magazine)  
KATE WONG (Senior Editor at Scientific American)



## 58 3.4 KLI Colloquia

*KLI Colloquia are informal, public talks that usually take place at the KLI in Klosterneuburg. In 2020, most colloquia were held virtually due to the pandemic. Abstracts of the presentations and information about the lecturers can be found on the website of the institute.*

ANN-SOPHIE MEINCKE  
University of Vienna

### **Bio-Agency and Natural Freedom: How to Solve a Metaphysical Puzzle with the Help of Biology**

LAURENT LOISON  
CNRS, Paris

### **Cybernetics and the Rise of Molecular Biology: The Case of Jacques Monod**

STEFAN MUELLER  
University of Vienna

### **Metabolic Optimality**

ORSOLYA RITA BAJER-MOLNÁR  
Centre for Ecology Research, Budapest

### **Who's Next? – The Evolution of Emergence**

IOAN FAZEY  
University of York

### **Knowledge Systems for Sustainability**

HARI SRIDHAR  
National Centre for Biological Sciences, Bangalore

### **Naeem Revisits Naeem et al. 1994: Reading between the Lines of a Scientific Paper**

SIMONE GINGRICH  
University of Natural Resources and Life Sciences, Vienna

### **Social-Ecological Perspectives on Forest Transitions**

MIHAELA PAVLICEV  
University of Vienna

### **The Evolution of the Female Orgasm**

SARAH ELTON

Durham University

**Macaque Variation: Local Adaptation or Plasticity?**

DAVID LUDWIG

Wageningen University

**Addressing Global Challenges Through Participation?  
The Epistemology of International Development**

ISABELLA SARTO-JACKSON

Konrad Lorenz Institute for Evolution and Cognition Research

**Converging Concepts of Evolutionary Epistemology  
and Cognitive Biology within a Framework of the  
Extended Evolutionary Synthesis**

SYLVIA CREMER

IST Austria, Klosterneuburg

**Social Immunity in Ants: Collective Disease Defence  
and Its Epidemiological Effects in Social Insect Colonies**

ALKISTIS ELLIOTT-GRAVES

University of Helsinki

**Optimal Model Complexity in Sustainability Science**

MICHIRU NAGATSU

University of Helsinki

**Sustainability Science as a Management Science:  
Beyond the Natural-Social Divide**

DANIEL BROOKS

University of Toronto

**A Perfect Storm: Climate Change, Emerging Disease,  
and Us**

FRANK ZACHOS

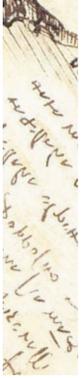
Natural History Museum Vienna

**Philosophical Aspects of the Species Problem and  
Their Bearing on Comparative Biology**

MARTIN KUSCH

University of Vienna

**Relativism in the Philosophy of Science**



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STEPHANIE SCHNORR  
University of Nevada & KLI, Klosterneuburg  
&

ALYSSA CRITTENDEN  
University of Nevada

**Living Up to the Ethics of Cross-Cultural Research During  
Biological Sampling With Vulnerable Communities in the  
Era of “-Omics” and Big-Data Research**

ALICE LACINY  
Konrad Lorenz Institute for Evolution and Cognition Research  
**Eco-Evo-Devo in Action: Parasite-Induced Morphologies  
in Ants**

JASON HICKEL  
University of London  
**Global Inequality and the Post-Growth Imperative:  
Rethinking Development Economics in the Age of  
Climate Breakdown**

ROBERTO CAZZOLLA GATTI  
Konrad Lorenz Institute for Evolution and Cognition Research  
**Ivindo: A Journey into the Green Heart of Africa**

EVA SCHERNHAMMER  
Medical University of Vienna  
**COVID-19 Epidemiology: The Origins and Course of a  
Once-in-a-Lifetime Pandemic from an Austrian Perspective**

DENIS FRANCESCONI  
Aarhus University  
**Pedagogy and Cultural Evolution. An Evolutionary Theory  
of Education for Sustainable Socio-Ecological Systems**

MARIANA DUTRA FOGAÇA  
University of Veterinary Medicine Vienna  
**Behavior: The Missing Link to Understanding Diet  
and Morphology**

CAMERON HU  
University of Chicago  
**Scenario Planning and the Anticipatory Epistemologies  
of Planetary Governance**



MARIA KRONFELDNER  
Central European University, Budapest / Vienna  
**Dehumanization and Essentialism**

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FLAVIA FABRIS  
Konrad Lorenz Institute for Evolution and Cognition Research  
**Investigation of the History and Philosophy of Cybernetics  
in Biology, Yields More Than Just a Theory of Machines**

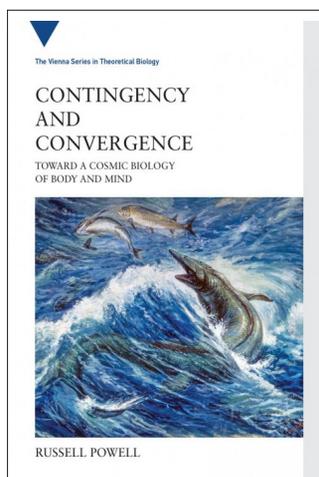




## 4.1 Vienna Series in Theoretical Biology

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



Volume 25:

RUSSELL POWELL

**Contingency and Convergence.**

Toward a Cosmic Biology of  
Body and Mind



## 64 4.2 Professional Papers and Books

ACHARYA A.

### **Pandemics and Prejudice: When there is an Epidemic, Social Prejudices Resurface**

The Hindu, India

<https://www.thehindu.com/society/pandemics-and-prejudice-when-there-is-an-epidemic-social-prejudices-resurface/article31246102.ece>

BARBERENA R, MENÉNDEZ LP, LE ROUX PJ, NOVELLINO P, TESSONE A, LUYT J, SEALY J, MARSH EJ, CARDILLO M, DURÁN V, LUCERO G, GASCO A, GUEVARA D, LLANO C, WINOCUR D, BENÍTEZ A, CORNEJO L, CORTEGOSO V, DA PEÑA G, FALABELLA F, FRIGOLÉ C, MÉNDEZ C, NUEVO DELAUNAY A, SANHUEZA L, SANTANA SAGREDO F, TRONCOSO A, ZÁRATE S.

### **Multi-Isotopic and Morphometric Evidence for the Migration of Farmers Leading Up to the Inka Conquest of the Southern Andes**

Scientific Reports 10: 21171

BICKEL M, CANIGLIA G, WEIZER A, LANG D, SCHOMERUS T.

### **Knowledge Systems for Sustainability: Municipal Climate Action Managers and the German Energy Transition**

Journal of Cleaner Production 277: 123628

CANIGLIA G, LUEDERITZ C, VON WIRTH T, FAZEY I, MARTIN-LOPEZ B, HONDRILLA K, KOENIG A, VON WEHRDEN H, LAUBICHLER MD, LANG DJ.

### **A Pluralistic and Integrated Approach to Action-Oriented Knowledge for Sustainability**

Nature Sustainability 4: 93-100

CARLS-DIAMANTE S.

### **Armed with Information: Chemical Self-Recognition in the Octopus**

Adaptive Behavior 28: 479-489

CAZZOLLA GATTI R.

### **The Pangolin's Revenge: SARS-CoV-2 Did not Emerge from a Lab but from Wildlife Exploitation**

GAIA: Ecological Perspectives for Science and Society 29: 79-82

CAZZOLLA GATTI R.

**Coronavirus Outbreak is a Symptom of Gaia's Sickness**

Ecological Modelling 426: 109075

CAZZOLLA GATTI R, AMOROSO N, MONACO A.

**Estimating and Comparing Biodiversity with a Single Universal Metric**

Ecological Modelling 424: 109020

CAZZOLLA GATTI R, KOPPL R, FATH B, HORDIJK W, KAUFFMAN S,  
ULANOWICZ R.

**On the Emergence of Ecological and Economic Niches**

Journal of Bioeconomics 22: 99-127

CAZZOLLA GATTI R, VELICHEVSKAYA A.

**Certified "Sustainable" Palm Oil Took the Place of Endangered  
Bornean and Sumatran Big Mammals Habitat and Tropical Forests  
in the Last 30 Years**

Science of The Total Environment 742: 140712

CAZZOLLA GATTI R, VELICHEVSKAYA A, TATEO A, AMOROSO A, MONACO A.

**Machine Learning Reveals that Prolonged Exposure to Air Pollution Is  
Associated with SARS-CoV-2 Mortality and Infectivity in Italy**

Environmental Pollution 267: 115471

CHAPUNGU L, NHAMO L, CAZZOLLA GATTI R, CHITAKIRA M.

**Quantifying Changes in Plant Species Diversity in a Savanna Ecosystem  
Through Observed and Remotely Sensed Data**

Sustainability 12: 2345

CORNEL H, GAHLEITNER SB, KÖHLER-SARETZKI T, NOWACKI K,  
SARTO-JACKSON I, SCHLEIFFER R, SCHRÖDER M, SUESS GJ.

**Bindung und Beziehung in der Sozialen Arbeit**

Soziale Arbeit 68: 324-325

DiFRISCO J, MOSSIO M.

**Diachronic Identity in Complex Life Cycles: An Organizational Perspective**

In: Biological Identity. Perspectives from Metaphysics and the Philosophy of  
Biology (Meincke AS, Dupré J, eds), pp. 1-19

Routledge: London



66 DORNINGER C, ABSON DJ, KLANIECKI K, DERWORT P, LANGSENLEHNER M, SPITTLER N, LAM DPM, APETREI CI, RIECHERS M, IVES CD, VON WEHRDEN H.

**Leverage Points for Sustainability Transformation: A Review on Interventions in Food and Energy Systems**

Ecological Economics 171: 106570

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**Transforming Knowledge Systems for Life on Earth: Visions of Future Systems and How to Get There**

Energy Research & Social Science 70: 250-265

GONZÁLEZ-CABRERA I.

**Review of “Cognitive Gadgets: The Cultural Evolution of Thinking” by Cecilia Heyes**

History and Philosophy of the Life Sciences 42: 13

GONZÁLEZ-CABRERA I.

**Review of “Becoming Human” by Michael Tomasello**

History and Philosophy of the Life Sciences 42: 48

GONZÁLEZ-CABRERA I.

**Review of “The Ape that Understood the Universe: How the Mind and Culture Evolve” by Steve Stewart-Williams**

The Quarterly Review of Biology 95: 150

GONZÁLEZ-CABRERA I.

**Generalized Model for Scores in Volleyball Matches**

Journal of Quantitative Analysis in Sports 16: 41-55

HAGAN RW, HOFMAN CA, HÜBNER A, REINHARD K, SCHNORR SL, LEWIS CM, SANKARANARAYANAN K, WARINNER CG.

**Comparison of Extraction Methods for Recovering Ancient Microbial DNA from Paleofeces**

American Journal of Physiological Anthropology 171: 275-284

HONAP TP, SANKARANARAYANAN K, SCHNORR SL, OZGA AT,  
WARINNER C, LEWIS CM.

**Biogeographic Study of Human Gut Associated crAssphage Suggests Impacts from Industrialization and Recent Expansion**

PLOS ONE 15: e0226930

HORDIJK W, ALTENBERG L.

**Developmental Structuring of Phenotypic Variation: A Case Study with a Cellular Automaton Model of Ontogeny**

Evolution & Development 22: 20-34

LACINY A.

**Review of "First in Fly. Drosophila Research and Biological Discovery" by Stephanie Elizabeth Mohr**

History and Philosophy of the Life Sciences 42: 14

LE MAÎTRE A, GRUNSTRA NDS, PFAFF C, MITTEROECKER P.

**Evolution of the Mammalian Ear: An Evolvability Hypothesis**

Evolutionary Biology 47: 187-192

MENÉNDEZ LP, MANSEGOSE DA, GIANNOTTI S.

**Craniofacial Variation in Historical Populations from Central-West Argentina during 16th to 19th Centuries**

Homo: Journal of Comparative Human Biology 71: 317-329

MENÉNDEZ LP, PASQUALINI S.

**El potencial informativo del estudio del endocráneo para contribuir al debate del poblamiento Sudamericano**

Boletín Novedades de Antropología INAPL 89: 9-12

MENÉNDEZ LP, RADEMAKER K.

**Estudio ecomorfológico de la variación craneana en poblaciones prehistóricas de Perú**

Revista del Museo de La Plata 5: 171-189

MITTEROECKER P, BARTSCH SJ, ERKINGER C, GRUNSTRA NDS,  
LE MAÎTRE A, BOOKSTEIN FL.

**Morphometric Variation at Different Spatial Scales: Coordination and Compensation in the Emergence of Organismal Form**

Systematic Biology 69: 913-926



68 MÜLLER GB.

**Evo-Devo's Contributions to the Extended Evolutionary Synthesis**

In: Evolutionary Developmental Biology: A Reference Guide (Nuno de la Rosa L, Müller GB, eds)  
Springer, online

MÜLLER GB.

**Developmental Innovation and Phenotypic Novelty**

In: Evolutionary Developmental Biology: A Reference Guide (Nuno de la Rosa L, Müller GB, eds)  
Springer, online

NICHOLSON DJ.

**On Being the Right Size, Revisited: The Problem with Engineering Metaphors in Molecular Biology**

In: Philosophical Perspectives on the Engineering Approach in Biology: Living Machines? (Holm S, Serban M, eds)  
Routledge: London

NUÑO DE LA ROSA L, PAVLICEV M, ETXEBERRÍA A.

**Pregnant Females as Historical Individuals: An Insight From the Philosophy of Evo-Devo**

Frontiers in Psychology 11: 572106

OLLER DK, GRIEBEL U, BOWMAN DD, BENE E , LONG HL, YOO H, RAMSAY G.

**Infant Boys are More Vocal than Infant Girls**

Current Biology 30: R426-R427

POLISELI L.

**Emergence of Scientific Understanding in Real-Time Ecological Research Practice**

History and Philosophy of the Life Sciences 42: 51

RAFIQI AM, RAJAKUMAR A, ABOUHEIF E.

**Origin and Elaboration of a Major Evolutionary Transition in Individuality**

Nature 585: 239-244

SARTO-JACKSON I.

**Neurobiologische Grundlagen sozialer Bindung**

Soziale Arbeit 68: 333-339

SCHNORR SL.

**The Soil in Our Microbial DNA Informs about Environmental Interfaces across Host and Subsistence Modalities**

Philosophical Transactions B 375: 20190577

STEEL M, HORDIJK W, KAUFFMAN SA.

**Dynamics of a Birth–Death Process Based on Combinatorial Innovation**

Journal of Theoretical Biology 491: 110187

STUHLTRÄGER J.

**Was die Zähne von Schimpansen erzählen**

Amtsblatt der Stadtgemeinde Klosterneuburg 05/20

TURCIOS-CASCO MA, CAZZOLLA GATTI R.

**Do not Blame Bats and Pangolins! Global Consequences for Wildlife Conservation after the SARS-CoV-2 Pandemic**

Biodiversity and Conservation 29: 3829-3833

VEIGL SJ.

**Notes on a Complicated Relationship: Scientific Pluralism, Epistemic Relativism, and Stances**

Synthese, <https://doi.org/10.1007/s11229-020-02943-2>

VEIGL SJ.

**Testing Scientific Pluralism**

PhD Thesis, University of Vienna

VIANNA FRANCO MP.

**Ecological Utopianism in Narodnik Thought: Nikolay Chernyshevsky and the Redemption of Land**

Capitalism Nature Socialism

<https://doi.org/10.1080/10455752.2020.1837896>

VIANNA FRANCO MP.

**The Factual Nature of Resource Flow Accounting in the Calculation in Kind of the “Other Austrian Economics”**

Economia 10: 453-472



70 VILLANUEVA HERNÁNDEZ LA.

**Los orígenes sociales de la música. La música como ensamblaje de capacidades cognitivas para la interacción social**

PhD Thesis, Universidad Nacional Autónoma de México

XAVIER JC, HORDIJK W, KAUFFMAN SA, STEEL M, MARTIN WF.

**Autocatalytic Chemical Networks at the Origin of Metabolism**

Proceedings of the Royal Society B 287: 20192377

### 4.3 Forthcoming Publications

ACHARYA A, SANYAL S.

**Where There's Muck There's Brass: Making Money from Sewage in Kolkata**

The Economist

APETREI C, CANIGLIA G, VON WEHRDEN H, LANG D.

**Knowledge for Sustainability: Just Another Buzzword?**

Global Environmental Change

BOOKSTEIN FL, BRAVO MORANTE G.

**The Fallacy of Forensic Age Estimation from Morphometric Quantifications of the Pubic Symphysis**

In: Remodeling Forensic Skeletal Age (Algee-Hewitt B, Kim J, eds)

Elsevier: Amsterdam

BOBADILLA RODRÍGUEZ H.

**Review of "When Maps Become the World" by Rasmus Grønfeldt Winther**

History and Philosophy of the Life Sciences

BOBADILLA RODRÍGUEZ H.

**Simulating Earthquakes: Explaining and Understanding with Highly Idealized Models**

PhD Thesis, University of Vienna

BRAVO MORANTE G, BOOKSTEIN FL, FISCHER B, SCHAEFER K, ALEMÁN AGUILERA I, BOTELLA LÓPEZ MC.

**Correlation of the Human Pubic Symphysis Surface with Age-at-Death: A Novel Quantitative Method Based on a Bandpass Filter**

International Journal of Legal Medicine

BRAVO MORANTE G, FISCHER B, BOTELLA LÓPEZ MC, BASTIR M.

**The Outline of the Pubic Symphyseal Surface is Sexually Dimorphic and Changes with Age in Humans**

Journal of Anthropological Sciences

CANGLIA G, JAEGER C, SCHERNHAMMER E, STEINER F, RUSSO F, RENN J, SCHLOSSER P, LAUBICHLER MD.

**COVID-19 Heralds a New Epistemology of Science for the Public Good**

History and Philosophy of the Life Sciences

CANIGLIA G, ZENK L, SCHERNHAMMER E, BERTAU M, STEINER G, KAINZ M, JAEGER C, SCHLOSSER P, LAUBICHLER MD.

**Scientists Responsibility for Global Futures**

Science & Diplomacy (AAAS Center for Science Diplomacy)

CARMEN E.

**How Do Social Relationships, Amongst Other Diverse Factors, Shape Community Change Initiatives in the Context of Climate Change?**

PhD Thesis, University of Dundee

CAZZOLLA GATTI R.

**A Multi-Armed Bandit Algorithm Speeds Up the Evolution of Cooperation**

Ecological Modelling

CAZZOLLA GATTI R, UGARKOVIC P, TIRALONGO F.

**New Evidence of a Fish-Bird Interspecific Feeding Association between the European Seabass and the European Shag in the Mediterranean Sea**

Aquatic Ecology

CAZZOLLA GATTI R, VELICHEVSKAYA A, GOTTESMAN B, DEVIS K.

**Grey Wolf Shows Signs of Self-Consciousness with the Sniff-Test of Self-Recognition (STSR)**

Ethology, Ecology and Evolution



72 DORNINGER C, HORNBERG A, ABASON DJ, VON WEHRDEN H, FELLER R, ENGLER J-O, GILJUM S, SCHAFFARTZIK A, HUBACEK K, WIELAND H.

**Global Patterns of Ecologically Unequal Exchange: Implications for Sustainability in the 21st Century**

Ecological Economics

FABRIS F.

**The Philosophical Impact of Cybernetics on Waddington's Epigenetics**

In: Epigenesis between Philosophy and Life Sciences (Continenza B, Ceccarelli D, eds)

Paradigmi

FABRIS F.

**Cybernetics and Reductionism in Biology: New Historical and Philosophical Perspectives**

International Multi-Conference on Complexity, Informatics and Cybernetics: IMCIC2021

FISCHER D, FÜCKER S, SELM H, SUNDERMANN A.

**Nachhaltigkeit erzählen: Durch Storytelling besser kommunizieren?**

oekom

FISCHER B, GRUNSTRA NDS, ZAFFARINI, E, MITTEROECKER P.

**Sex Differences in the Pelvis Did not Evolve De Novo in Modern Humans**

Nature Ecology & Evolution

GRUNSTRA NDS, BARTSCH SJ, LE MAÎTRE A, MITTEROECKER P.

**Detecting Phylogenetic Signal and Adaptation in Papionin Cranial Shape by Decomposing Variation at Different Spatial Scales**

Systematic Biology

LACINY A.

**Among the Shapeshifters: Parasite-Induced Morphologies in Ants (*Hymenoptera*, *Formicidae*) and Their Relevance within the EcoEvoDevo Framework**

EvoDevo

LACINY A.

**Review of "The Stockholm Paradigm: Climate Change and Emerging Disease" by Daniel R. Brooks, Eric P. Hoberg, Walter A. Boeger**

History and Philosophy of the Life Sciences

LUDWIG D, KOSKINEN I, MNCUBE Z, POLISELI L, REYES-GALINDO L.

**Global Epistemologies and Philosophies of Science**

Routledge: London

LUEDERITZ C, CANIGLIA G, BURCH S.

**How Do Small Businesses Craft Strategies? Examining Collective Agency to Bridge the Planned versus Emergent Dichotomy in Sustainability Strategy**

Business Strategy and the Environment

MENÉNDEZ LP.

**The Peopling and Diversification of Humans in the Americas: A Bioanthropological Review of 150 years of Debate**

Journal of Anthropological Sciences

MENÉNDEZ LP.

**An Integral Study of Diet Composition and Diet Hardness in Late Holocene Southern South American Populations**

In: Trends in Biological Anthropology. Volume III (Mahoney Swales D, Nystrom P, eds)

BABAO Proceedings Annual Conference 2015

MENÉNDEZ LP.

**Una introducción al concepto y cálculo del error de medición en estudios morfológicos**

In: Avances en Antropología Forense (Quinto-Sánchez M, Gomez Valdez JA, eds)

Universidad Nacional Autónoma de México: Mexico City

MENÉNDEZ LP, BUCK LT.

**Evaluating Potential Proximate and Ultimate Causes of Phenotypic Change in the Human Skeleton over the Agricultural Transition**

In: The Convergent Evolution of Agriculture in Humans and Insects (Schultz TR, Peregrine P, Gawne R, eds)

MIT Press: Cambridge, MA

MITTEROECKER P, GRUNSTRA NDS, STANSFIELD E, WALTENBERGER L, FISCHER B.

**Did Population Differences in Human Pelvic Form Evolve by Drift or Selection?**

Bulletins et mémoires de la Société d'anthropologie de Paris



74 MÜLLER GB, ABOUHEIF E.

**Evolutionary Developmental Biology**

Oxford Bibliographies, Oxford University Press: Oxford

NUÑO DE LA ROSA L, MÜLLER GB.

**Evolutionary Developmental Biology: A Reference Guide**

Springer: Cham

POLISELI L, LEITE C.

**Developing Transdisciplinary Practices: An Interplay between Disagreement and Trust**

In: Global Epistemologies and Philosophies of Science (Ludwig D, Koskinen I, Mncube Z, Polisele L, Reyes-Galindo L., eds)

Routledge: London

RAMPELLI S, TURRONI S, MALLOL C, HERNÁNDEZ C, GALVÁN B, SISTIAGA A, BIAGI E, ASTOLFI A, BRIGIDI P, BENAZZI S, LEWIS CM, WARINNER C, HOFMAN CA, SCHNORR SL, CANDELA M.

**Components of a Neanderthal Gut Microbiome Recovered from Fecal Sediments from El Salt**

Communications Biology

SARTO-JACKSON I.

**Narratives in Health Care: A Case for Psychoeducation Drawing on the Biopsychosocial Model**

Balkan Journal of Philosophy

SARTO-JACKSON I.

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

Vernon Press: Wilmington

STUHLTRÄGER J, SCHULZ-KORNAS E, KULLMER O, JANOCHA MM, WITTIG RM, KUPCZIK K.

**Variability in Molar Wear Patterns Reveals High Versatility in Dental Behavior within One Chimpanzee Subspecies (*Pan troglodytes verus*)**

PLoS ONE

VIANNA FRANCO MP, RIBEIRO LC, ALBUQUERQUE EM.

**Beyond Random Causes: Harmonic Analysis of Business Cycles at the Moscow Conjecture Institute**

Journal of the History of Economic Thought

WALKER D, WEGER J, FOSTER K, BONANNO A, KUMAR S, LEAR K, BASILIO R, GERMAN L.

**Environmental Governance: Broadening Ontological Spaces for a More Livable World**

Environment and Planning E: Nature and Space

WEITZER J, LAUBICHLER MD, BIRMANN BM, BERTAU M, ZENK L, CANIGLIA G, JÄGER CC, STEINER G, SCHERNHAMMER E.

**Comment on Alley, SJ, et al. As the Pandemic Progresses, How Does Willingness to Vaccinate against COVID-19 Evolve?**

International Journal of Environmental Research and Public Health

WEITZER J, STEINER G, JÄGER C, BIRMANN BM, BERTAU M, ZENK L, CANIGLIA G, LAUBICHLER M, SCHERNHAMMER E.

**Vaccine Hesitancy and Trust in Government**

Journal of Public Health

WHITE S, MENÉNDEZ LP.

**Biosocial Complexity and the Skull**

In: Behaviour in our Bones (Hirst C, ed)

Elsevier: Amsterdam



76 **4.4 Journal *Biological Theory***

**Volume 15, Issue 1:**

BONIOLO G, CAMPANER R.

**Life Sciences for Philosophers and Philosophy for Life Scientists:  
What Should We Teach?**

DeGREGORI J, ELDREDGE N.

**Parallel Causation in Oncogenic and Anthropogenic Degradation  
and Extinction**

SCHNEIDER T.

**Can We Talk About Feminist Epistemic Values Beyond Gender?  
Lessons from the Gut Microbiome**

SMITH SE.

**Is Evolutionary Psychology Possible?**

FORSDYKE DR.

**Aging, DNA Information, and Authorship: Medawar, Schrödinger,  
and Samuel Butler**

**Volume 15, Issue 2:**

MARTINS DOS REIS CR, LUVINSON ARAÚJO LA.

**Extended Evolutionary Synthesis: Neither Synthesis Nor Extension**

WENDLER H.

**Philosophical Primatology: Reflections on Theses of Anthropological  
Difference, the Logic of Anthropomorphism and Anthropodenial,  
and the Self-Other Category Mistake Within the Scope of  
Cognitive Primate Research**

LEVIN M.  
**Revisiting Burr and Northrop's "The Electro-Dynamic Theory of Life" (1935)**

IBANEZ S.  
**The Evolution of Ecosystem Phenotypes**

SMIT H.  
**The Cartesian Conception of the Development of the Mind and Its Neo-Aristotelian Alternative**

**Volume 15, Issue 3:**

AFFIFI R.  
**Engaging the Adaptive Subject: Learning Evolution Beyond the Cell Walls**

GRIFFITHS PE, MATTHEWSON J.  
**Diseases Are not Adaptations and neither Are Their Causes**

FORSDYKE DR.  
**Revisiting George Romanes' "Physiological Selection" (1886)**

BALARI S, LORENZO G, SULTAN SE.  
**Language Acquisition and EcoDevo Processes: The Case of the Lexicon-Syntax Interface**

HAIDLE MN, SCHLAUDT O.  
**Where Does Cumulative Culture Begin? A Plea for a Sociologically Informed Perspective**



78 **Volume 15, Issue 4:**

TANG S.

**Pre-Darwinian Evolution Before LUCA**

SOTO AM, SONNENSCHNEIN C.

**Revisiting D.W. Smithers's "Cancer: An Attack on Cytologism" (1962)**

FULLERTON B.

**Does Art Bring Us Together? An Empirical Approach to the Evolutionary Aesthetics of Ellen Dissanayake**

MORRISON DM.

**Disambiguated Indexical Pointing as a Tipping Point for the Explosive Emergence of Language Among Human Ancestors**

RICHARDSON K.

**In the Light of the Environment: Evolution Through Biogrammars Not Programmers**

ROES FL.

**On the Evolution of Virulent Zoonotic Viruses in Bats**

WILEY JC.

**Psychological Aposematism: An Evolutionary Analysis of Suicide**

## Referees for Volume 15

RIADH ABED  
RAMSEY AFFIFI  
JAN BAEDKE  
ANN-SOPHIE BARWICH  
RAMRAY BHAT  
MARION BLUTE  
DANIEL BROOKS  
ZACHARY BURTON  
ANDREW BUSKELL  
RICHMOND CAMPBELL  
GUSTAVO CAPONI  
LINNDA CAPORAE  
CHARLES CARTER  
BERNARD CHAPAIS  
MATHIEU CHARBONNEAU  
SAM CLARKE  
GREGORY COOPER  
SOPHIE DE BEAUNE  
ANDREAS DE BLOCK  
NEI DE FREITAS NUNES-NETO  
ERIC DESJARDINS  
ANTOINE DUSSAULT  
CHARBEL EL-HANI  
NILES ELDREDGE  
PAUL EWALD  
ALAN FISKE  
Q. FULLER  
BRUCE GLYMOUR  
JAMES GRIESEMER  
JOEL HAGEN  
MANUEL HERAS-ESCRIBANO  
PHILIPPE HUNEMAN  
SVERKER JOHANSSON  
RICHARD JOYCE  
JONATHAN KAPLAN  
ANTON KILLIN  
EUGENE KOONIN  
AARON KOZBELT  
ÁDÁM KUN  
ROBERT LAYTON  
TIM LEWENS  
ROBERT LICKLITER  
SAM LIN  
KATHERINE LIU  
FRANCESCA MERLIN  
IRINA MIKHALEVICH  
ROBERTA MILLSTEIN  
ALESSANDRO MINELLI  
JOHN MITANI  
DONALD MORRISON  
GERD MÜLLER  
PARASHKEV NACHEV  
KARL NIKLAS  
MICHAEL O'BRIEN  
D. KIMBROUGH OLLER  
JUN OTSUKA  
KARENLEIGH OVERMANN  
EMILY PARKE  
TREVOR PEARCE  
MAKMILLER PEDROSO  
JEFFREY PETERSON  
CHARLES PIGDEN  
RONALD PLANER  
ARNAUD POCHEVILLE  
PAOLO ROGNINI  
NILS ROLL-HANSEN  
JOAN ROUGHGARDEN  
SOPHIA ROUSSEAU-MERMANS  
ISABELLA SARTO-JACKSON  
ROBERTO SERRA  
JOAN SILK  
SUBRENA SMITH  
VASSILIKI BETTY SMOCOVITIS  
YOAV SOEN  
KIM STERELNY  
SONIA SULTAN  
KRISTEN SYME  
STÉPHANE TIRARD  
TOBIAS ULLER  
DENIS WALSH  
RASMUS WINTHER



## 80 4.5 Scientific Presentations

CANIGLIA G.

### **Politics and Power in Sustainability Transitions**

(with Binz C. and Ahlborg H.)

International Association for Sustainability Transitions, IST, Klosterneuburg

FABRIS F.

### **New Transnational Perspectives on 20th-Century Organismic Biology**

ESHS 2020 "Visual, Material and Sensory Cultures of Science," Bologna

GRUNSTRA NDS, LOUYS J, ELTON S.

### **Pleistocene Differentiation in a Successful Generalist Primate:**

### **Evidence from Modern Cranial Morphology in Longtailed Macaques**

10th Annual Meeting of the European Society for the Study of Human Evolution (ESHE), online

GRUNSTRA NDS

### **Evolutionary, Functional and Theoretical Morphology of Mammals:**

### **From Primate Skulls to Bat Pelvises**

Young Researcher Meeting Morphology, Deutsche Zoologische Gesellschaft, Vienna

FISCHER B, GRUNSTRA NDS, ZAFFARINI E, MITTEROECKER P.

### **Patterns of Sex Differences in the Pelvis Did not Evolve De Novo in Modern Humans**

10th Annual Meeting of the European Society for the Study of Human Evolution (ESHE), online

LACINY A.

### **Investigating Parasite-Induced Morphologies in Ants – Common Problems and Possible Solutions**

Young Researcher Meeting Morphology, University Vienn

LACINY A.

### **Of Worms and Shapeshifters – The Phenotypic Consequences of Mermithid Nematode Infection in Ants**

Insects: Infection & Immunity, Royal Entomological Society, online

LACINY A.

### **Ants, Parasites and (a Lack of) Systematics**

Network of Biological Systematics Austria, NOBIS Young Researchers' Day, online

MENÉNDEZ LP.

**300,000 Years of Evolution in Homo Sapiens: Origins, Expansions, Evolutionary History and Ecology**

Escuela Nacional de Antropología e Historia (ENAH, Mexico), online

MENÉNDEZ LP.

**Convergencias morfológicas en poblaciones humanas de climas fríos provenientes de Asia, Norteamérica y Sudamérica**

Mexican Association of Biological Anthropologists (AMAB, Mexico), online

MENÉNDEZ LP.

**Comparative Analysis on the Differential Role of Population History and Selection during Human Morphological Diversification in South America**

89th Annual Meeting of the American Association of Physical Anthropologists, Los Angeles, CA

MENÉNDEZ LP, PROFICO A.

**Virtual Cranial Reconstruction and Evolutionary Rates: 10,000 Years of Morphological Evolution in Human Populations from the Andes**

Evolutionary Young Researchers Meeting in Morphology, University of Vienna

SARTO-JACKSON I.

**Sensation and Perception**

Webster Vienna Private University, online

SARTO-JACKSON I.

**Biocognition: Knowledge Accumulation in Biological Systems**

MeiCogSci Lecture Series, University of Vienna, online

SARTO-JACKSON I.

**Das soziale Gehirn**

SZB Hinterbrühl

SARTO-JACKSON I.

**Das soziale Gehirn**

SOS Kinderdorf, Pinkafeld

SARTO-JACKSON I.

**Warum ich weiß, was Du fühlst**

Brain Awareness Week 2020, Medical University of Vienna, online



82 SARTO-JACKSON I.

**Gehirnentwicklung und soziale Bindungen**

VHS Wiener Urania, online

SARTO-JACKSON I.

**Angeboren – Anerzogen?**

VHS Wiener Urania

SARTO-JACKSON I.

**Das soziale Gehirn**

Science Goes School, Initiative of the Government of Lower Austria, online

SARTO-JACKSON I.

**Panel Discussion — Predictive Processing: From Concept to Circuits**

Vienna Cognitive Science Hub's Predictive Processing Symposium, online

SCHNORR SL.

**Cultivating Health through the Study of Human-Environmental Interactions**

Hearing on Gene-Culture Coevolution, University of Vienna

SCHNORR SL.

**Ancient Foods, Fiber, and Bugs: Microbiomes and Functional Genetics to Discover Past Human Behaviors**

Proseminar Series, Department of Anthropology, University of Nevada, Las Vegas

STANSFIELD E, KUMAR K, MITTEROECKER P, GRUNSTRA NDS.

**Biomechanics of the Pelvic Floor Constrains the Evolution of the Human Pelvis: A Finite Element Approach**

10th Annual Meeting of the European Society for the Study of Human Evolution (ESHE), online

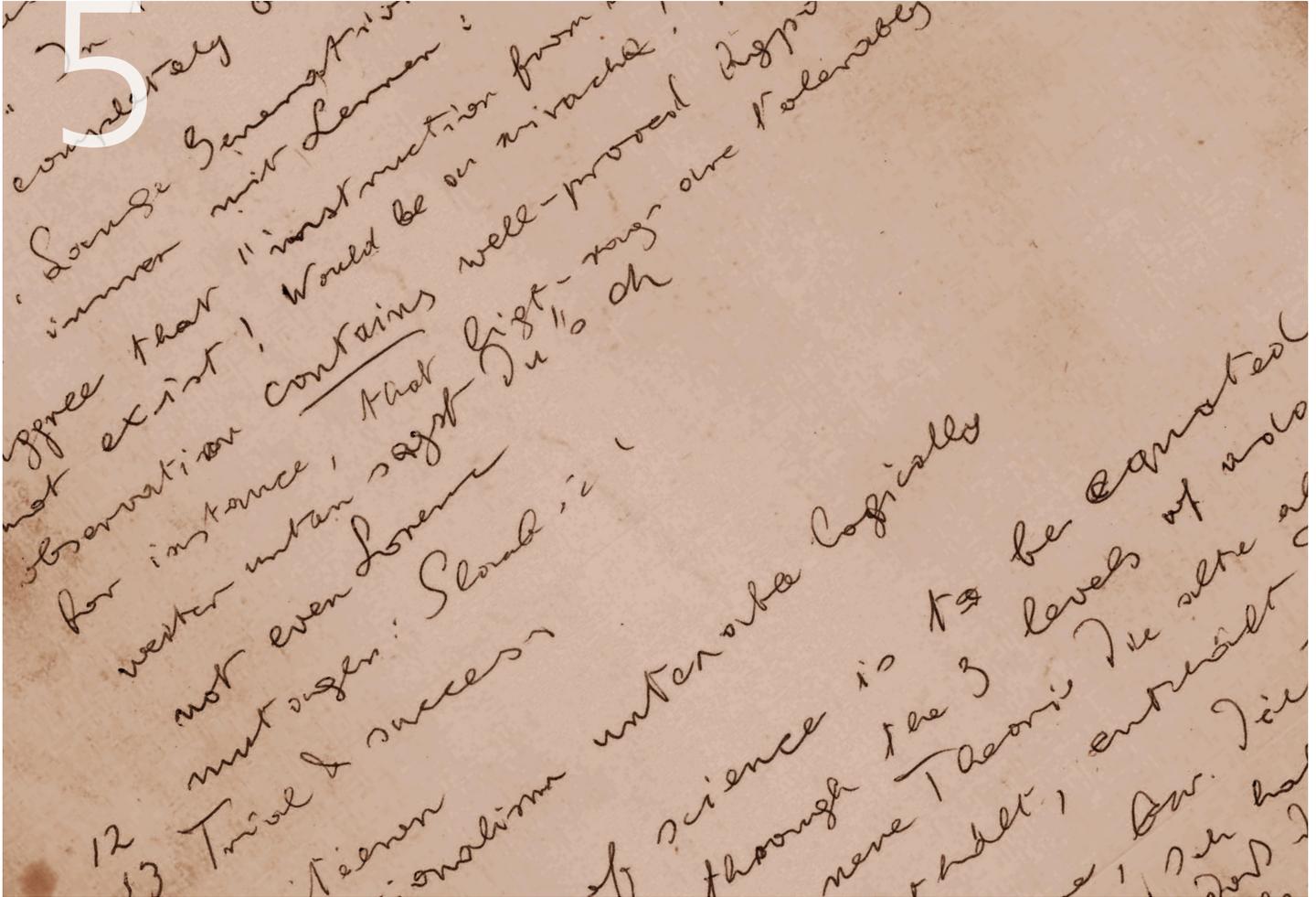
VEIGL SJ.

**Biology, Philosophy & Sociology in Two Minutes**

Woodstock of Biology - Physiological Irrelevant Conference, Tel Aviv University



## Further Activities



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

## 5.1 Transdisciplinary Research Project

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**Plastic Futures, Navigating  
the Packaging Dilemma in  
the Food Sector towards  
Sustainable Development**

**20 November &  
11 December 2020**

*FWF in #connectingminds*

*Organizers: Guido Caniglia (KLI), Thilo Hofmann (University of Vienna),  
Hilda Tellioglu (Vienna Technical University)*

### Topic

Plastic Future is one of the 8 workshops selected by the FWF out of 87 submissions in its newly created program #connectingmind, which aims to support transdisciplinary research at the science-society interface to address complex real-world problems. The online workshop took place on two different days and addressed the problem of plastic packaging for foods as a major dilemma in our societies. Massive use of plastics for packaging is essential to protect food, but it also contributes to increased pollution and waste legacies. There is an urgent need to create knowledge and build capacities to navigate this dilemma across multiple sectors of society and the economy. From grassroots initiatives to new business models, there are many attempts to reduce the negative effects of the overreliance on plastic packaging. However, there is a dearth of knowledge and systematic approaches that capitalize on and integrate the often-contrasting perspectives from scientific research and from societal stakeholders involved in different stages of the life-cycle of plastic packages for food, from production to consumption and disposal. In our workshop we brought together researchers from the natural, informatic, and social sciences as well as actors from society, business and policy world to reflect on promising action strategies that foster



- 86 (1) alternatives to conventional packaging and (2) new social norms and more sustainable social practices to navigate the packaging dilemma. We started developing together future-oriented research plans through transdisciplinary collaboration to navigate the packaging dilemma as a systemic challenge towards sustainable development.

### Participants

#### *Researchers*

MICHAEL HABIGER, Vienna Technical University  
GERFRIED MIKUSCH, Vienna Technical University  
DOMINIKA GLOGOWSKI, ArtECO/Industry  
INES OMANN, Vienna Business School  
THORSTEN HUEFFER, University of Vienna  
MICHAEL ZUMMSTEIN, University of Vienna

#### *Civil Society Participants*

K. POELZL, ALPLA Werke  
S. NADHERNY-BORUTIN, PlasticsEurope  
P. ERLACHER, Bio-Catering Gaumenfreundinnen OG  
G. SCATTOLIN, WWF Austria  
D. STANZEL, Verein Gartenpolylog  
S. SCHAUPP, Overtura – Solidarische Landwirtschaft  
B. STREICHER, Science Center Netzwerk  
B. IMHOF, Liquifer Systems Group GmbH  
G. MOSER-WAGNER, Institut für Interaktive Raumprojekte  
C. ROLLAND, Environmental Protection Agency of the City of Vienna

## 5.2 Grants & Prizes



### StartClim 2020 Grant GUIDO CANIGLIA & DOMINIKA GLOGOWSKI

2020-2021

*KLI & artEC/Oindustry*

Future-oriented research for sustainability aims to support interventions at the science-society interface where both researchers and societal actors generate knowledge about how to deal with wicked sustainability challenges of our time, such as climate change or loss of biodiversity.

Our institute is a “Home to Theory that Matters in the Life and Sustainability Sciences.” As an center of advanced studies, the KLI has recently started engaging in transformational research capitalizing on its excellent track record in evolution and cognition research. As part of this endeavor, we believe the arts can and should play a key role. Because of their creative and experiential nature, the arts can help generate new theories and practices that disclose imaginaries, foster learning, and empower people to move towards more sustainable and just futures.

With the StartClim 2020 grant, Guido Caniglia (KLI) and Dominika Glogowski (artEC/Oindustry) organized workshops involving KLI researchers, guest and local artists as well as scientists and other key figures engaged in citizen science projects. The workshops took place from November 2020 to April 2021 and made use of transdisciplinary methodologies that support synergistic work and mutual learning at the Science-Art-Society interface.



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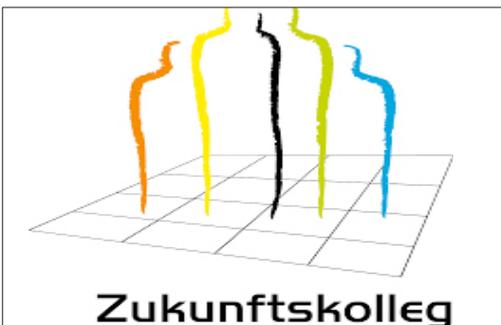


**Marie Skłodowska Curie  
Action COFUND  
STEPHANIE SCHNORR**

**2021-2024**

*EU Horizon 2020*

Stephanie Schnorr, currently a postdoctoral fellow at the KLI and previously a researcher at the KLI with her own funding (NSF grant), received a REinforcing Women In REsearch (REWIRE) Grant for her project “Microbial Networks of DHA Synthesis (MiNDS).” The grant is provided by the EU within the Marie Skłodowska Curie Actions COFUND initiative and fully funds Stephanie Schnorr’s project for 3 years.



**Zukunftskolleg  
HARI SRIDHAR**

**2020**

*University of Konstanz*

KLI Visiting Fellow Hari Sridhar was awarded a fellowship by the Zukunftskolleg Konstanz for his project “Naeem Revisits Naeem et al. 1994: Reading between the Lines of a Scientific Paper.”

### 5.3 Professional Development

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**Diversity and  
Awareness Training  
Workshop**  
ZARA

**16 November 2020**  
*KLI Klosterneuburg, online*

The need to develop a series of long-term work and action plans on diversity and awareness were prompted by internal and external incidents that happened this year. Internally, we faced challenges arising from creating and maintaining an institute that values and recruits fellows from diverse backgrounds with diverse research topics. Externally, the incidents that triggered a global Black Lives Matter movement clearly indicated that a tipping point has been reached. We all need to do our part.

As a first step of our collective reflection, we collaborated with ZARA (Zivilcourage und Anti-Rassismus-Arbeit) to organize our first "Diversity and Awareness Training Workshop." The workshop was based on experience-based and reflection-based exercises. It was also an opportunity to get to know each other better using a reflexive approach. Together with two diversity trainers, we reflected on prejudices, privileges, differences and strategies for dealing with diversity:

- Raising awareness on diversity on a personal and structural level
- Raising awareness of the effects of individual and social discrimination due to privilege or belonging to a minority
- Reflecting on one's own prejudices and stereotypes
- Analyzing different aspects of one's own identity and that of others
- Analyzing different aspects of one's own digital identity and speech styles

The training was led by Volker Frey and Dieter Gremel. Both trainers have been working with ZARA – Zivilcourage und Anti-Rassismus-Arbeit and ZARA Training for more than 15 years.



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**Professional Training & Fellows' Coaching**  
**Ruth Simsa**

**21 February 2020**  
*KLI Klosterneuburg*

This workshop provided skills for the KLI fellows' professional career, helped them to be aware about their mental models of their career, and supported them in finding clarity about their next steps.

The training provided a theory input about the systemic view of social systems and of organizations, the triangle between strategy, structure, and culture and the concept of role. Fellows had the opportunity to examine the role of the researcher, apply this concept to their current role at the institute and research community, and elaborate the concept of the role as researcher in a social system thereby clarifying expectations and understand role-taking, role-making, and role-shaping.

**5.4 Science Communication & Outreach**

In 2019, the KLI has established a new communication strategy using social media and other communication channels. This endeavor has increasingly gained momentum in 2020. The main purpose is to proactively strengthen our bonds with the multiple scientific communities connected to the KLI. This proved especially important during lockdown due to the COVID-19 pandemic because it ensured a constant, engaging connection with fellows and other institutes.

As part of this strategy, new communication formats were launched. For example, Lynn Chiu, on behalf of the KLI, interviewed KLI fellows and collaboration partners, published and disseminated these interviews and featured important papers published by KLI fellows and staff. As of 2021, the different activities of the KLI and achievements of KLI fellows and staff will be widely shared in the seasonal newsletter "KLife."



As every year, the KLI participated in the “European Researchers’ Night,” an international event funded by the European Commission under the Horizon 2020 program and coordinated by the Government of Lower Austria. In 2020, the researchers’ night took place as an online event.



The KLI showed movies produced by Biofaction of the work of two KLI postdoctoral fellows, Alice Laciny and Christian Doringner. The movies presented were accessible by the general public from 9 October to 30 December 2020.

## 5.5 Acknowledgment

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





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