tological data. Such a new 'data lake' can transcend the previous design choices, allow a wider spectrum of data registration, while allowing the integration, access and curation of previously accumulated data for the next 25+ years.

Big Questions

What is your BIG Question in Paleontology?

The goal of the Big Questions project is to develop a community-based vision to guide research in paleontology in the years ahead. To accomplish this goal, paleontologists from around the world were invited to submit their Big Questions and to participate in the working groups to further develop and refine those questions for publication.

FossilDiscovery

The application is developed from of two existing apps, combining the advantages of both Rockd and FossilFinder. It will allow users to upload fossil images and their data (e.g., GPS, measurements, preservation) and get identification from experts. Improvements are in collaboration with the FAU's Pattern Recognition Lab to gradually move to automated identification of fossil specimens. Amateurs will enjoy fossil identification as the app will have an implementation of a reward-based system of expertise. The app will also allow the professional scientific community to use verified data to study (regional) biodiversity patterns.

Thus, ***FossilDiscovery will be true citizen science*** and will create a network of amateur and professional paleontologists.

Science schools

Building on previous Analytical Paleobiology Workshops (APW) including new developments, we will hold annual science schools at the FAU in Erlangen. The science schools will focus on data analysis and subject-specific quantitative methods. Training content will include many hands-on exercises. The courses will be run by local staff as well as international experts on particular topics.

Application will be online on our website and reviewers, who will rate applications in a standardized fashion, will evaluate each application to decide on the participants regarding career potential, course readiness, access to relevant training resources at their home institution, potential to improve practical programming skills, and inclusiveness.

Meet the team

PI's Professor Wolfgang Kiessling (FAU, Erlangen)
Professor Manuel Steinbauer (University of Bayreuth)

PostDoc / Scientific contact
Dr Elizabeth Dowding (FAU, Erlangen)

Monitoring / General contact
Dr Barbara Seuss (FAU, Erlangen)

App development / databases
Michael Burger (Softmatch) & Dr Ádam Kocsis (FAU, Erlangen)

Summer Science School
Dr Ádam Kocsis (FAU, Erlangen)

project center news

Contact

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Questions ? Get in contact...
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Syn-Paleo

Strengthening Paleontology
The German hub for global cooperation

Over the last few decades, Paleontology has transformed from a largely descriptive subject to a predictive science with potential to elucidate global change impacts and evolutionary laws. Novel research directions, an increasingly quantitative approach, and new techniques offer many opportunities for Paleontology.

This innovative project is funded by the Volkswagen Foundation and suppported by the Friedrich-Alexander-University Erlangen-Nuremberg, and it invites all Paleontologists to collaborate.
The PI's are Prof. W. Kiessling (FAU) and Prof. M. Steinbauer (University of Bayreuth).

FAU Universität Bayreuth VolkswagenStiftung

About... Paleontology is a small subject at universities. In Germany, there are fewer than 50 professorships scattered across different locations. This fragmentation makes it difficult to develop common visions and research priorities. The initiative of the Volkswagen Foundation for the structural strengthening of "small subjects" focuses on this issue and promotes innovative ideas.

This longterm project will strengthen Paleontology structurally, reduce weaknesses, and build on the opportunities provided by the low number of actors in a small subject. At the Paleosynthesis Center we want to develop visions and strategies together with the global paleontology community.

What we do

- ✓ Formation of a *scientific advisory board* nominated by the scientific community in Germany
- ✓ Regular *scientific workshops* for the identification of a research agenda for paleontology (in Germany), with the initiation and implementation of cooperative, international projects
- ✓ Organization of *science schools* for PhD students and experienced scientists for the introduction of new quantitative methods including data analysis in paleontology
- ✓ The *interactive app* „FossilDiscovery": developed together with the Pattern Recognition Lab in Nürnberg-Erlangen; with the help of this app interested lay researchers can identify their own fossil finds and at the same time contribute their findings to the scientific community

Scientific workshops

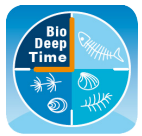
The best way to motivate structural changes and enhance personal networks in Paleontology is to engage the paleontological community in joint scientific projects. We will therefore establish repeated synthesis workshops to work on research questions that arise from a joint discussion of the paleontological community. Workshops will provide a place of inherent horizon scanning and bring together existing but disparate data, tools, and theories in new and perhaps unexpected ways.

Implementation

An open call for proposals is published every year. The scientific advisory board selects the most promising workshop topic(s) based on scientific and societal impact and the potential to overcome structural problems of the field. As a result of the Covid-pandemic, workshops were transformed into a online and eventually hybrid formats to cope with these challenging circumstances. With the gathered positive experience the new workshops in our second series follow this format with intensive onlinepreparation in advance of the in-person workshop in Erlangen.

First series of workshops

In the first series three workshops are supported by the project or supported by our PostDoc.



BioDeepTime - PI's Pincelli Hull (Yale), Marina Costa Rillo (ICBM, Univ. Oldenburg) and Seth Finnegan (UC Berkeley). *„In a rapidly changing world, there is an urgent need to understand how communities respond to environmental perturbations of varying magnitudes and rates"*. The approach of the workshop is to examine the turnover of communities, spanning from the Modern to millions of years in the past, in response to climate changes, including the current climate crisis to achieve the main goal: "*identify those climate change scenarios where community turnover scales in step, catastrophically shifts, or remains relatively stable*." This will help to evaluate and understand the relationship, in rates and magnitudes, between climate change and modification of biological communities.

Diversity Dynamics and Crisis in Paleontology (DDCP) - The advisory board decided to provide partial funding. PI's: Nussaibah Raja-Schoob (FAU) and Emma Dunne (FAU). When *„considering the global challenges of climate change and current diversity crisis, and the perspective palaeobiology can contribute to tackling these challenges, our field cannot afford exclusion of or mistrust by any group"*. With their workshop Nussaibah and Emma aim to bring together paleontologists from various cultural, racial, socio-economic and research backgrounds to colaborate with JEDI specialists. Their goals are to 1) identify and quantify the nature and scale of the diversity crisis in paleontology and how it affects research output, and 2) evaluate the current state of paleontology in order to be able to dismantle identified barriers to resources and opportunities.

PaleoNovelty - PI's: Tim Staples and John Pandolfi (both University of Queensland, Australia). The PI's want to *„examine strengths and weaknesses of past uses of the term* ‚novelty' *in ecology and paleoecology as a team of interdisciplinary researchers."* The key message is that *„paleontological research (is) critical to understand the extent and drivers of ecological novelty, placing modern patterns in a deep-time context"*. The goal of the workshop is to develop a standardized definition and measure of novelty for application across scales and disciplines.

NEW Second series of workshops

Both workshops will be on database management. The benefit of funding both - BITE and IRAL - is that they can operate in synergy and also will build on BioDeepTime.

Biotic Interactions in Deep Time (BITE) - PI's: Devapriya Chattopadhyay (IISER Pune, Department of Earth and Climate Science) and Aleksandra Skawina (University of Warsaw). *„Biotic interaction plays an important role in the evolution of groups through time."* A collaborative initiative to develop a standardized database is needed as it will allow researchers to quantitatively evaluate the relive role of abiotic and biotic drivers of evolution through time. It will also contribute to conservation efforts by predicting future changes in biotic interactions in relationship with diversity and climatic fluctuations. Thus, the primary objective of the planned workshops is to develop a standardized way to report ancient biotic interactions.

Integrated Record of Ancient Life (IRAL) - PI's Ádám Kocsis (FAU) and Emma Dunne (FAU). *„Compilations of fossil data are fundamental to modern paleontology."* Multiple databases exist, each focusing on specific domains of paleontological research. Unifying the data service in a single, Big Data framework can open new dimensions of paleontological research and more equitable global cooperation. The proposed workshops are intended to pave the pathway to a new, globally integrated infrastructure for paleon-