



Strengthening Paleontology

The German seed for global cooperation

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

About...

Paleontology is a small subject at universities. In Germany, there less than 50 professorships scattered across different locations. The fragmentation makes it difficult to develop common visions and research priorities. Over the last few decades, Paleontology has been transforming from a largely descriptive subject to a predictive science with underestimated potential to elucidate global change impacts and evolutionary laws. Novel research directions, an increasingly quantitative approach, and new techniques offer many opportunities for Paleontology.

The initiative of the Volkswagen Foundation for the structural strengthening of "small subjects" focuses on this issue and promotes innovative ideas. The paleontology of the FAU has prevailed with its concept against numerous applicants in the competition. This long-term project will strengthen Paleontology structurally, reduce weaknesses, and build on the opportunities provided by the low number of actors in a rare subject.

At the Paleosynthesis Center we want to develop visions and strategies **together**. As an example, "what are the most important questions of paleontology currently and how can we answer them collectively?"

Concept

The aim of the strategic concept is to strengthen palaeontology not only at the university location Nuremberg-Erlangen, but also as a subject in Germany. In a SWOT analysis, the influence of palaeontology in the field of environmental sciences is identified as a particular strength of the discipline, while its weakness is its lack of focus in terms of content and methodology, with the result that the subject is not able to innovate enough, especially due to the lack of agreement on common methods.

The application sees as a new opportunity the possibility to influence policy advice, and as a continuing threat the lack of career prospects for students due to the decline of the hydrocarbon industry. The strategy concept combines a bottom-up networking process with methodological innovations in the digital age.

The following package of measures proposed:

1. Formation of an elected eight-member scientific **advisory board** from the entire scientific community in Germany.
2. Organization of two **international workshops** per year for the identification of a research agenda for paleontology in Germany and the initiation and implementation of cooperative projects.
3. Organization of four-week **science schools** for PhD students and experienced scientists for the introduction of new quantitative methods including data analysis into paleontology.
4. The **interactive app** „FossilDiscovery“ is being 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.

I. Why a scientific advisory board?

The Synthesis Center is an initiative for all paleontologists

They are represented by a scientific board of 8 international peers (PI Prof. Wolfgang Kiessling) who decide on the strategic focus and synthesis workshop topics. The strategic expert body reflects a balance of young and more experienced scientists and has a much more equal gender balance than the overall subject.

II. Scientific workshops

The best way to motivate structural changes and enhance the personal network in Paleontology is an engagement of the paleontological community in joint scientific projects.

We will therefore establish repeated synthesis workshops that assemble international scientists across the subject and related disciplines to work on research questions that arise from a joint discussion of the paleontological community. These cooperative science workshops and the associated projects will provide a place of inherent horizon scanning and bring together existing but disparate data, tools, and theories in new and perhaps unexpected ways.



Workshop Implementation

Workshops will take place in spring and fall of each year. Science workshops will be held at FAU in the newly established educational center. An open call for proposals will be announced every year. A scientific advisory board will select the most promising workshop topics based on scientific and societal impact and the potential to overcome structural problems of the field.

III. Science schools



Based on previous Analytical Paleobiology Workshops (APW) and regarding new developments, we will hold annual science schools within the new educational center.

The science schools will focus on data analysis and subject-specific quantitative methods. Training content with many hands-on exercises will be defined and continuously updated in interaction between lecturers and attendants. The courses will be run by local staff as well as national and international experts on particular topics.

The initial science school will be held in the framework of the APW, for which PI Kiessling has committed himself for 2021 and will initially be held for graduate students. They will be joined by up to three postdocs and professors in the final week.

Application will be online on our website and reviewers, who will rate applications in a standardized fashion, will review 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. Starting in the third year, students will also be admitted on a first-come, first-served basis and the course will be reduced to two weeks.

IV. Interactive app

FossilDiscovery

A new interactive application

The application will be developed on base of two already existing apps and combine the advantages of both Rockd and FossilFinder. It will allow users to upload fossils and their data (e.g., locality/GPS-data, measurements, preservation) and get identification by volunteering experts. Improvements will be continuously and in collaboration with the FAU's Pattern Recognition Lab. This will allow to gradually move to automated identification of fossil specimens.

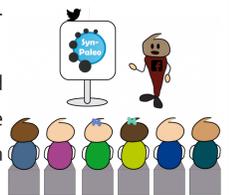
Amateurs will enjoy fossil identification – FossilDiscovery will have an implementation of a reward-based system of expertise. The application will also allow the professional scientific community to use verified data to study (regional) biodiversity patterns – thus, FossilDiscovery will be true citizen science and will create a network of amateur and professional paleontologists.

Outreach

Interaction between professional paleontologists and the public is currently very limited with public talks, popular-science articles, notifications on social media, and reportages on TV.

However, over centuries amateur researchers have contributed to science and professionals have benefitted.

The project aims to enhance communication and cooperation between public and professionals to increase public interest and visibility since paleontological data are next to everyone's garden. We also want to counteract the biased public impression that Paleontology is still largely devoted to digging out dinosaur bones.



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Homepage

Paleosynthesis Center

