THE UNIVERSITY OF ARIZONA

COLLEGE OF SCIENCE Ecology &



## **Professional development Opportunity**

## Teaching the evolution of biological complexity

## National Science Foundation-funded summer workshop for K-12 teachers

We are scientists and teachers working on the evolution of biological complexity and teaching this subject in the K-12 and college classrooms (1-3). Our framework is the major evolutionary transitions in hierarchical complexity that have occurred during the history of life on earth, such as the transition from unicellular life to multicellular organisms. We use social principles, such as cooperation and conflict, to teach this subject; we find these principles are familiar to students in their lives and serve as points of engagement for them.

As part of a research project on this topic funded by the National Science Foundation (https://www.nsf.gov/awardsearch/showAward?AWD\_ID=2029999), we seek applications from K-12 teachers for an in-person summer 2025 internship to be held in the Michod lab (https://michodlab.arizona.edu/) in the Department of Ecology and Evolutionary Biology at the University of Arizona (Tucson AZ main campus). This workshop is co-directed by Dr. Michod (michod@arizona.edu) and Dr. Dinah Davison from Kansas State University (dinahdavison@gmail.com).

Teachers will develop instructional materials for teaching hierarchical organization and complexity in their classroom and will test them during the school year. The time commitment will involve one intensive week, likely during July 2025. The exact summer dates are to be determined, depending on the schedules of accepted teachers and lab members. Teachers will be asked to report back for a one-day workshop during the coming school year after implementing their instructional materials in their classroom. There is a \$1,600 stipend the workshop, which will run for 1 summer week and 1 day during school year (likely on a Saturday). A certificate for professional development (PD) hours is available.

Teachers will receive research training by participating in on-going research projects on hierarchical organization and complexity in the volvocine green algae model system (4) for studying biological complexity. Based on the teachers' interests and the grade level they teach, teachers may learn skills such as microscopy, collecting algae from nature, maintenance of algae cultures in the classroom, genetic analysis, studying population growth, and using molecular genetic techniques.

Interested teachers should email the following to either Dr. Michod or Dr. Davison (addresses above) with the subject line "NSF summer internship: [Your full name]." Please, include (i) a few paragraphs briefly introducing yourself, describe what interests you about this project and list any relevant classes you have taught or will be teaching next year (ii) a curriculum vitae or resume, (iii) black out dates when you could not participate during summer 2025

More information about our work can be found at http://michodlab.arizona.edu/ and https://dinahdavison.net/. Please contact Dr. Michod or Dr. Davison for any questions. Informal inquiries are welcome!

In the Michod lab at the University of Arizona where the workshop will be held, we value our inclusive climate because we know that diversity in experiences and perspectives is vital to advancing innovation, critical thinking, solving complex problems, and creating an inclusive academic community.

- R. E. Michod, D. R. Davison, H. Sanders, J. S. Hoskinson, K. M. Gagnier, Translating research on evolutionary transitions into the teaching of biological complexity. *Evolution* (*N. Y*). **76**, 1124–1138 (2022).
- J. S. Hoskinson, D. R. Davison, H. Sanders, B. Jiménez-Marín, R. E. Michod, Translating research on evolutionary transitions into the teaching of biological complexity. II. A NGSS-aligned framework for teaching the hierarchy of life. *Evol. Educ. Outreach.* 17 (2024), doi:https://doi.org/10.1186/s12052-024-00209-w.
- 3. D. R. . Davison, J. S. . Hoskinson, S. R. La, B. Jiménez-Marín, R. E. Michod, Translating research on evolutionary transitions into the teaching of biological complexity: III. Tools for teaching the hierarchy of life. *Am. Biol. Teach.* In press. (2025).
- E. R. Hanschen, D. R. Davison, Z. I. Grochau-Wright, R. E. Michod, Evolution of individuality: a case study in the volvocine green algae. *Philos. theory Pract. Biol.* 9 (2017), doi:http://dx.doi.org/10.3998/ptb.6959004.0009.003.