LAFAYETTE

THE Geological RECORD

NEWS AND HIGHLIGHTS
FROM THE DEPARTMENT
OF GEOLOGY AND
ENVIRONMENTAL GEOSCIENCES

From left to right: Brian Lejeune, Dru Germanoski, Lawrence L. Malinconico Jr., Tamara Carley, John Wilson, Ana Meyerson, David Sunderlin, Jennie Pinho, and Kira Lawrence.

Hello from Van Wickle Hall! Since there have been many changes in our department over the past few years, including personnel, program, and building enhancements (detailed on the following pages), we thought it would be a good time to share an update with you.

After more than four decades at the College, Professor Guy Hovis retired in 2014. His replacement, Professor Tamara Carley, who has expertise in igneous petrology and volcanology, joined us that same year. Our longtime mineral curator, Bill Metropolis, who worked diligently and very successfully to expand our collections, retired in 2018 and has been replaced by his understudy, Brian Lejeune. In addition to possessing a deep knowledge of minerals, Brian recently earned his Ph.D. in chemical engineering. After serving the College for more than 30 years, Robert Thomas, our part-time technician, retired in spring 2019. We recently hired Jennie Pinho to serve in the role of instrument support specialist. She is overseeing our ever-expanding suite of analytical equipment that supports coursework and student and faculty research.

I am pleased to report that Lafayette Geology and Environmental Geosciences program remains vibrant, with a continued strong emphasis on field work as well as geologic problem-solving for the modern era. We continue to offer a diverse array of interim field courses to geologically interesting places (e.g., Hawaii, Ecuador/Galapagos, New Zealand). We also provide a wealth of individualized research experiences to our students. We are proud of the innovative work our students, faculty, and staff have done and are doing. We have benefited tremendously over the past decade from support from the College as well as generous donations from alumni/ae. We are grateful for this support and are eager to share with you here how these contributions have transformed into physical, technological, and experiential enhancements that have impacted our program.

As you know, the connections formed at Van Wickle don't end after graduation. We want to stay connected. Please keep in touch. Email us at geology@lafayette.edu. If you have particular interest in mentoring students, speaking in our seminar series, or otherwise sharing your expertise, we are always grateful to alumni/ae who want to share their knowledge and expertise with our motivated students. Please see the last few pages of this document for opportunities to engage with and/or help enhance our program.

Kira T. Lawrence

Kira T. Lawrence
MARKLE PROFESSOR AND DEPARTMENT HEAD

FACULTY & STAFF

Tamara Carley, ASSISTANT PROFESSOR
PH.D., VANDERBILT UNIVERSITY
igneous petrology, volcanology, geochronology, geochemistry
SINCE 2014

Dru Germanoski, DR. ERVIN R. VAN ARTSDALEN '35 PROFESSOR OF GEOLOGY
PH.D., COLORADO STATE UNIVERSITY
earth surficial processes (geomorphology), environmental geology, hydrogeology
SINCE 1987

Kira T. Lawrence, JOHN H. MARKLE PROFESSOR AND DEPARTMENT HEAD
PH.D., BROWN UNIVERSITY
paleoclimatology and paleoceanography, earth systems history, campus sustainability
SINCE 2006

Lawrence L. Malinconico Jr., ASSOCIATE PROFESSOR
PH.D., DARTMOUTH COLLEGE
applied geophysics, tectonics, structure, volcanology
SINCE 1989

David Sunderlin, ASSOCIATE PROFESSOR
PH.D., UNIVERSITY OF CHICAGO
paleobiology, stratigraphy and basin analysis, terrestrial ecosystem evolution, paleoenvironments
SINCE 2006

John R. Wilson, LABORATORY COORDINATOR
M.S., VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
remote sensing, geographic information systems
SINCE 2001

Jennie Pinho, INSTRUMENT SUPPORT SPECIALIST
M.S., LEHIGH UNIVERSITY
isotope geochemistry, carbon cycling, tectonics
SINCE 2019

Ana Meyerson, DEPARTMENT SECRETARY
SKILLFUL MENTOR OF GEOLOGY MAJORS
SINCE 2003

Brian Lejeune, MINERAL CURATOR
PH.D., NORTHEASTERN UNIVERSITY
SINCE 2018

MaryAnn Malinconico, RESEARCH ASSOCIATE
PH.D., COLUMBIA UNIVERSITY
SINCE 1989

ACTIVE FACULTY

At the **GEOLOGICAL SOCIETY OF AMERICA'S 2019 SECTION MEETINGS** in Portland, Maine, and Charleston, S.C.:

- Tamara presented "Icelandic Rhyolite Generation Influenced by Glacial Climate in the Late Pleistocene: Evidence from Oxygen Isotopes and Ages in the Zircon Record."
- Dru presented "Multidisciplinary Monitoring in Anticipation of the Removal of Several Low-Head, Run-of-River Dams—Bushkill Creek, Pennsylvania."
- Dave presented "Tracking Palms in the Fossil Record: Implications for Reconstructing Paleoenvironments, Paleoclimate, and Evolutionary History."
- Faculty mentored eight student projects and presentations at these conferences.

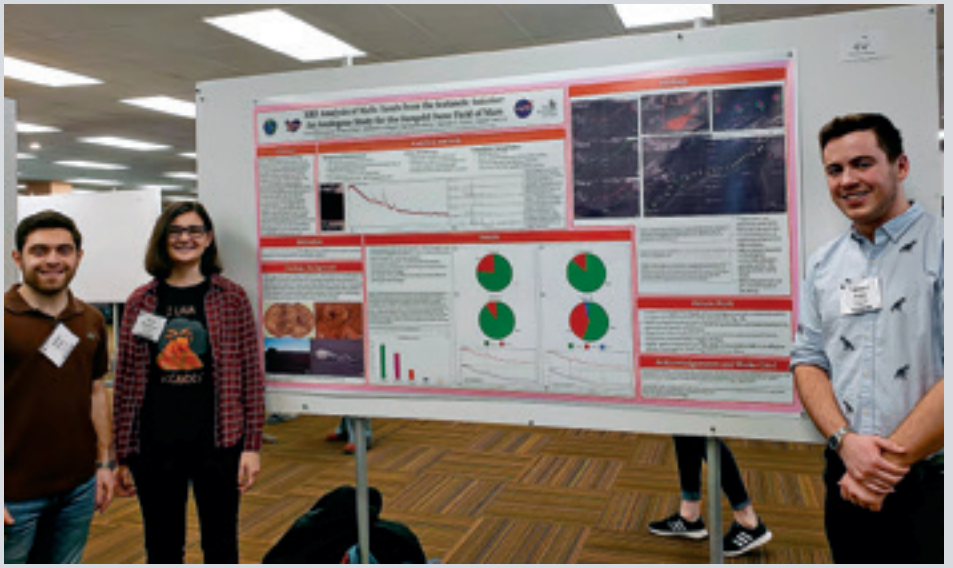
GEOLOGICAL SOCIETY OF AMERICA'S ICELAND EXPEDITION JULY 2019

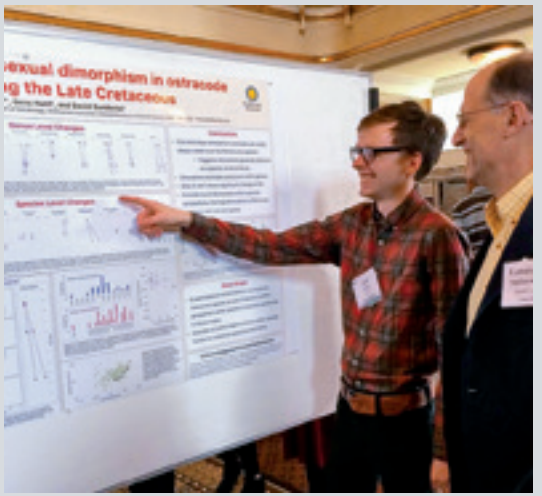
Tamara co-led a 10-day Iceland expedition (shown below) and co-authored a detailed guide book to educate and prepare tour participants. Amanda Leaman '15, a forestry technician for the USDA Forest Service in the Uinta-Wasatch-Cache National Forest in Utah, took part.

At the **GEOLOGICAL SOCIETY OF AMERICA'S SEPTEMBER 2019 MEETING** in Phoenix: Dave presented "Lowland and Coastal Vegetation in an Ancient Island Setting: The Paleoflora of the Early Jurassic Talkeetna Volcanic Formation, Talkeetna Mountains, Alaska."

At the **AMERICAN GEOLOGICAL UNION'S DECEMBER 2019 MEETING** in San Francisco:

- Tamara will present a poster "The birth of bubbles by spinodal decomposition: Solving the tiny bubble paradox." She also will give an invited talk: "Transitions between the Hadean, Archean, and modern world: Zircon Kds clarify formation conditions of Earth's earliest crust."
- Kira will give an oral presentation "A Comparison of Orbital-Resolution, Late Pleistocene, Alkenone and Faunal-Based Sea-Surface Temperature Reconstructions from the Southwest Pacific."
- Larry will be actively involved in the short course "Using Geophysics Data to Teach about Flooding, Landslides, and Climate Change in Undergraduate Majors' Courses."





ENGAGED STUDENTS

Most of our students who participate in individualized research opportunities present their work at regional and/or national conferences, and many of them eventually publish their research with their faculty mentors. The opportunity to present at a professional scientific conference is often transformative. Students hone their presentation skills, learn from the questions and feedback they receive, and expand their professional networks by talking and sharing insights with the wider geological community. Over the past several years, our majors have presented research at a range of different conferences, including AGU (American Geophysical Union), GSA (Geological Society of America) national and regional conferences, and LPSC (Lunar and Planetary Science Conference). Engaged alumni at the meeting often join us for an impromptu geology department reunion.

OPPORTUNITIES FOR STUDENTS

Fieldwork

Our curriculum continues to offer a variety of field-based opportunities that provide students with access to diverse geological environments. Our goal is to bring earth sciences to life for our students.

IN OUR BACKYARD: All courses, from introductory to upper-level, contain field experiences, exploring the varied geology within driving distance of Lafayette. Mesozoic volcanics and sedimentary rocks, a vast Paleozoic basin succession, and Proterozoic metamorphic suites are just a few of the unique geologic localities only a stone's throw from campus. The department also maintains a groundwater monitoring well-field at Lafayette's Metzgar Athletic Fields complex and a stream-monitoring network on the Bushkill Creek watershed adjacent to campus for hydrologic studies.

PHOTO COURTESY OF BILL STANK, PHOTOSYNTHPHOTO.COM

FURTHER AFIELD: Course field trips often take us beyond our local surroundings. Each fall, Larry and Dave take students in the Structure & Tectonics of the Earth, a unique two-semester sequence combined with Sedimentology & Stratigraphy, to Wyoming for a five-day field mapping and geological history project. Thanks to the generosity of an anonymous donor, this experience is now endowed, which ensures that this transformative learning opportunity can continue in perpetuity. Other course projects include sedimentary processes on the Jersey Shore, paleoecology of the Chesapeake Bay, and basin analyses in New York State and Connecticut.

AROUND THE WORLD: Department faculty teach several immersive field courses in exotic locations, including Iceland, Hawaii, Ecuador & the Galapagos Islands, New Zealand, and the National Parks of the western U.S. These special learning opportunities, which are offered during the January interim session or over the summer, enable students to observe and interact with the region's unique geological record and the local environmental issues there.

On & Off-Campus Study

Special research projects and off-campus learning opportunities enable students to deepen and expand their educational experience.

INDEPENDENT STUDENT RESEARCH: Geology majors are encouraged to participate in research experiences to gain knowledge and skills that enhance what they learn in the classroom. Almost half of our majors participate in an individualized research experience. Field- and lab-based research has taken students to Alaska, England, France, New Mexico, California, Nevada as well as New York City, Washington, D.C. and other field areas closer to the College.

SPECIAL PROGRAMS: Lafayette geology students take part in a variety of semester-long off-campus educational opportunities through the College's study abroad program. In recent years, students have studied internationally including programs in the United Kingdom, Tanzania, and New Zealand, as well as domestically in the programs at the Marine Biological Laboratory and Sea Education Association (SEA) in Massachusetts.

LC GEOLOGY

OUR FACILITIES & TECHNOLOGY

We prepare the geologists of the future using a wide array of methods, ranging from traditional tools to new, cutting-edge technologies. Van Wickle also houses extensive mineral and fossil collections, which our faculty and staff are working to make more accessible to our students and the broader Lafayette community. Here are a few new features.

DIGITAL FIELDBOOK

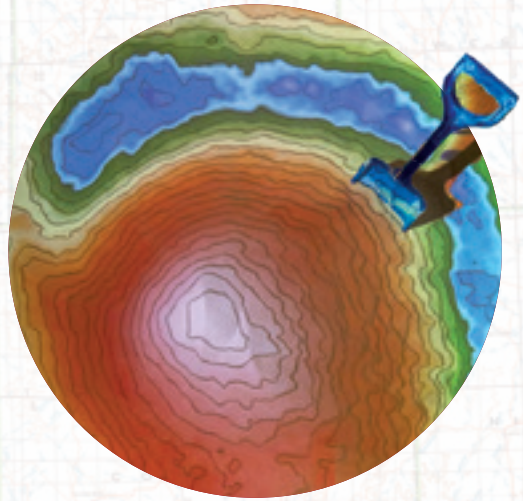
Since 2012, Larry and Dave have been collaborating with Computer Science and Information Technology Services to develop GeoFieldBook, a digital tool designed to complement or replace a paper geology field notebook. The app integrates the iPad's GPS, camera, and data management capabilities to allow geologists to record structural and formation information, log geo-location data, link images to records, input predefined formation names, and then export the data to formatted .csv files for easy integration into digital mapping and analysis applications. Larry and Dave also led the development of a stratigraphic column drawing app called StratLogger, which has been used in our sedimentology and stratigraphy course. Both GeoFieldBook and StratLogger are available on Apple's AppStore for free.

XRD

Our PANalytical Empyrean X-ray powder diffraction system was purchased with a $265,000 grant from the U.S. National Science Foundation. This state-of-the-art instrument is capable of performing phase analysis at high temperatures, enabling an understanding of Earth's history. The XRD is also capable of the analysis of solid objects with computed tomography.

AUGMENTED-REALITY SANDBOX

Tamara and John added an augmented-reality sandbox to our museum space. This resource helps students better visualize two-dimensional depictions of three-dimensional landscapes. It has become a much-loved feature of our building by students and visitors to Van Wickle alike.



MINERAL/PETROLOGY CLASSROOM

The mineralogy/petrology classroom has undergone a complete transformation to become a high-tech learning laboratory. Petrographic microscopes can be connected into the room's electronics, allowing images from any microscope to be displayed on the screens at the front of the room. All microscopes are Wi-Fi enabled such that students can take photographs, and annotate them directly on their computer for use in coursework and research. The classroom also features 12 different rock materials in the countertops, enabling the work surfaces of the room to serve as educational resources.

DIGITAL DISPLAY BOARD

Through the generosity of an alumni, our museum has been enhanced with a digital display board, which displays geological content ranging from current geologic events (e.g. recent volcanic eruptions, hurricane storm tracks, sea ice extent) to pictures of our students in the field and presenting at research conferences. The display also allows our classes to have a medium for sharing end-of-semester projects. For example, students in our Volcanology courses have made videos detailing the dynamics of their chosen volcanos. Students in a variety of our courses present their work at a formal end-of-semester poster session. Their posters are subsequently displayed here.

OPPORTUNITIES TO ENGAGE WITH AND CONTRIBUTE TO OUR PROGRAM

We are grateful for the donations that have enabled us to make a range of physical, technological, and experiential enhancements to our program. As we continue to strive to be a cutting-edge, top-notch department, there are ongoing projects we would like to expand and new initiatives that need support to become a reality.

Rendering of proposed Van Wickle Hall rock garden

Outdoor Experiential Learning Classroom

Hands-on learning enhances our students' ability to evaluate scientific questions, make and record observations, and conduct critical analysis. We have the opportunity to further experiential learning experiences for our students by adding a rock garden outside Van Wickle Hall. This new campus feature will include large specimens of the local stratigraphic succession and structural and exotic rock elements. The garden will be complemented by a geologic cross-section installation inside Van Wickle. Rocks will be sourced from various quarries representing Precambrian through Jurassic time periods. In the future, we hope to add a community space built from geologic materials outside the south entrance of Van Wickle to serve as an outdoor classroom and gathering place for departmental functions.

An on-campus rock garden will give introductory students the opportunity to see rocks that will enhance classroom and lab instruction. It will also provide students in upper-level courses the opportunity to use the rocks to solve geological problems and gain additional exposure to rocks they encountered in the field. The garden and gathering space will attract attention to the geology program from prospective students and the entire campus community.

In order for this project to come to fruition, we need your help! An anonymous donor has stepped forward and agreed to fund a portion of this project, but we are in need of additional support to make it a reality.

If you are interested in helping to bridge the gap between conceptual and hands-on learning for Lafayette geology students, please see below.

Support the Next Generation

Lafayette strives to continuously build on its strengths and reinforce its standing among the nation's most outstanding undergraduate institutions. The College set an ambitious goal with the recently concluded Live Connected, Lead Change campaign, which raised funding to ensure the College can admit students of the highest caliber without regard to their families' financial means. Living and learning with people from a wide range of backgrounds and experiences is at the heart of a residential liberal arts education. Our department supports this initiative and recognizes that incoming students may need assistance to have the full Lafayette experience. Every student should have the opportunity to take every course offered in the course catalog. We are committed to that. Below are ways in which we were working to ensure all students have access to the full suite of educational opportunities in our department.

- **HENRY DARWIN ROGERS FUND:** This endowed fund supports student research and provides funds for field and/or lab work as well as for students to travel to professional conferences. The fund also enables students to have the resources they need to conduct research projects and present their work to the scientific community, which promotes their academic enrichment and professional development.

- **LAWRENCE AND MARYANN MALINCONICO FUND:** The Malinconicos have generously created a fund to help students participate in one of our department's interim courses offered by our department. The fund provides students who would otherwise not be able to participate the opportunity to take courses in unique and geologically interesting locations. The fund seeks to ensure that these opportunities are accessible to all students.

- **GEOLOGY GENERAL SUPPORT:** In addition to supporting research and field work, support for student awards, equipment, and transportation are among critical needs that can be addressed through general support for the department. When you make an unrestricted gift to the geology department, you provide funds to update labs and enrich programming, ensuring today's students continue to receive an outstanding academic experience. To support our faculty and students, visit development.lafayette.edu, and select "Give to Lafayette." Under "designations," select "areas of your choice." Check "other," then "continue." Under "selected designations," add the name of the geology fund (above) you wish to support.

Participate in Our Seminar Series

Join us as a presenter or guest at our departmental seminar series. Most presentations are on Fridays at noon in Van Wickle 108.

See our schedule:
geology.lafayette.edu/seminar-series

Contribute to Our Alumni/ae Biographies Project

We are seeking additional profiles for our Alumni/ae Biographies Project (ABP), which highlights the diverse and impressive accomplishments of our graduates.

You can find it at geology.lafayette.edu/alumni-biography-project
If you would like to be featured, please contact John Wilson at wilsonj@lafayette.edu

FOR MORE INFORMATION ABOUT SUPPORTING OUR PROGRAMS: CONTACT MATT KEEFE 610-330-3083, KEEFEM@LAFAYETTE.EDU

DEGREE PROGRAMS

The Department of Geology and Environmental Geosciences offers an A.B. degree and two B.S. tracks: traditional geology and environmental geology. Each degree provides a broad background in the various disciplines of the geosciences.

visit us:
geology.lafayette.edu | *email us:* **geology@lafayette.edu**

LAFAYETTE COLLEGE

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FOR A DEEPER LOOK AT OUR SOCIAL SCENE:

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