

THE IUP GEOSCIENCE ALUMNI NEWSLETTER

GEO TIDINGS

In this issue

**50th Anniversary Celebration Photos
Designing the new IUP Science Building**

Cover Photo: IUP students take a break while mapping near Little Molas Lake, Colorado

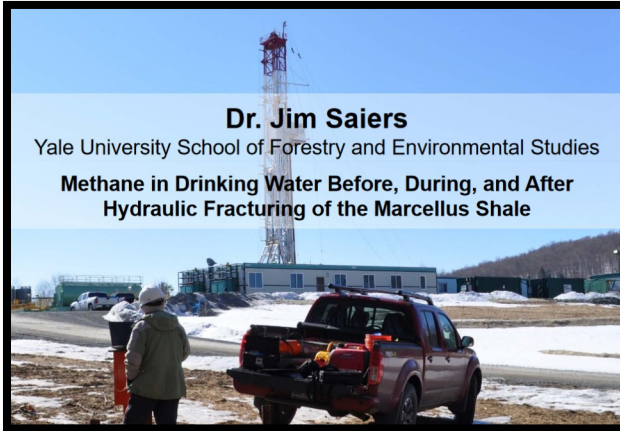


Our 50th Anniversary Celebration



The Geoscience Anniversary Banner being carried in the Homecoming Parade by department faculty, current students, returning alumni and friends of the department.

James Saiers '89 flew in from Yale to serve as our Distinguished Alumni Speaker for the Friday Seminar.

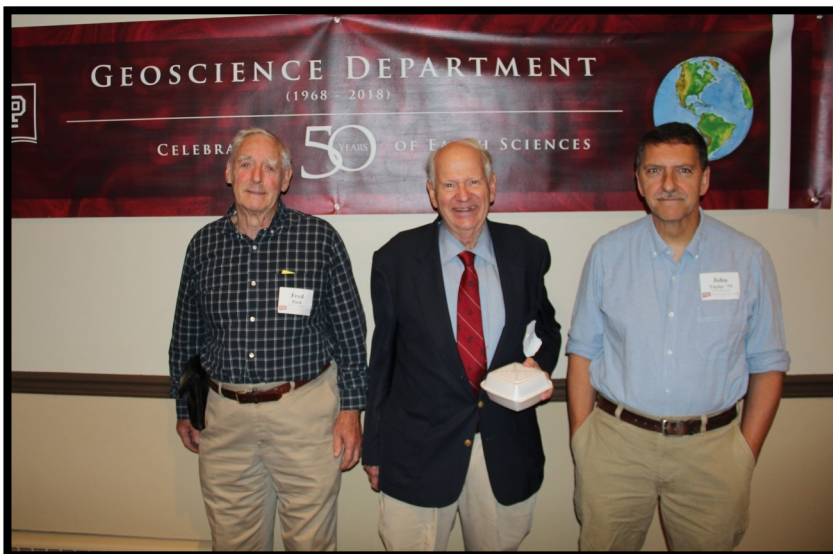


Dr. Jim Saiers
Yale University School of Forestry and Environmental Studies
Methane in Drinking Water Before, During, and After Hydraulic Fracturing of the Marcellus Shale

Steve Smith '01 (who took most of these great photos) shows off his 50th Anniversary T-shirt.



Retired geoscience professors Fred Park, Joe Clark, and John Taylor '75 at the 50th Anniversary Banquet.



Pictures from the previous 25th Anniversary Banquet courtesy of alumna Holly (Smeltzer) Smythe '78.



Our 50th Anniversary Celebration



Tables at the banquet displayed photos of former faculty members Paul Prince, Bob Woodard and Walt Granata, along with booklets from four decades of student presentations at Geoscience Days!

Alumni traveled from places as far away as Texas to celebrate with us. Pictured here: Christa Ziegler with Yvonne Branan, both Class of '01.



Alumni from the department's stellar first decade reunited: John Taylor '75, Carla Kertis Brezinski '78, Dave Brezinski '77, John Repetski, '69. Eric Yocum '78, Tom Moore '76 and Pat Imbrogno '78.



Current and retired Geoscience faculty attending the reunion included (from left): Tom Moore '76, Jon Lewis, Steve Hovan (chair), Ken Coles, Yvonne Branan '01, Fred Park (retired), Karen Rose Cercone, Joe Clark (retired), John Taylor '75 (retired), Nick Deardorff, and Katie Farnsworth.

New Science Building Updates

Preliminary Design Approved by Council of Trustees

A preliminary design by the Pittsburgh architectural firm of Perfido, Weiskopf, Wagstaff & Goettel has been approved by the IUP Council of Trustees. These conceptual sketches show what the building will look like in its current form. The round tower will house a new planetarium (see facing page more on that) as well as innovative teaching spaces. There will be an outdoor courtyard leading from the Oak Grove to a glass-walled atrium, and a mix of shared research and teaching labs along the upper floors.

The university plans to send the project out for bids by the end of 2019. If all goes well, final completion of the building is expected 30 months later, in the spring of 2022.

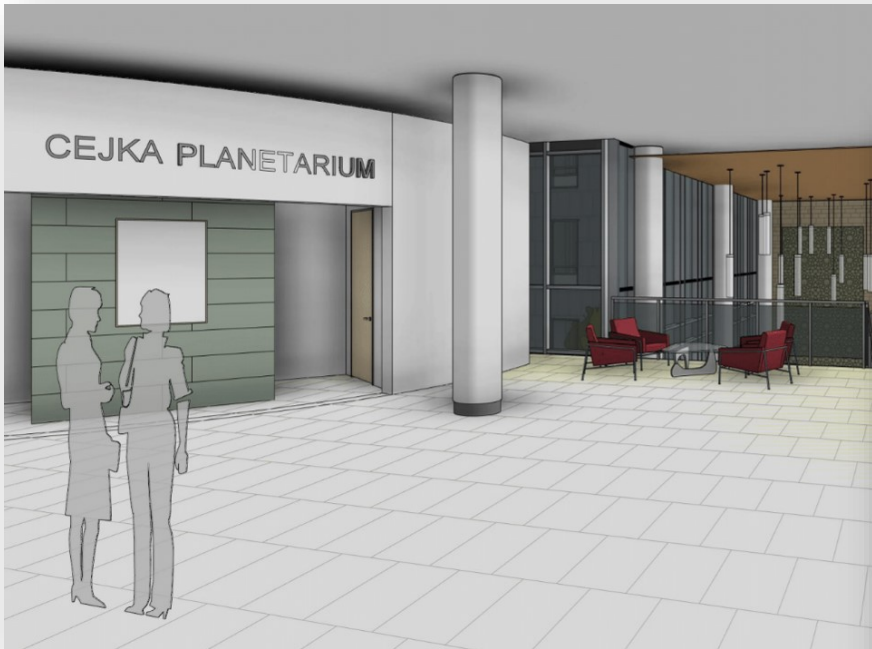


Leonard Hall Demolition Kicks Off Construction Process

Over the summer and fall of 2018, Leonard Hall was torn down to make room for construction of the Science Building. In the picture, our College Dean Deanne Snively is standing in the footprint of the future Oak Grove entrance, with the new North Dining Hall visible in the background.



Our New Planetarium Will Be Named in Honor of Tim & Deb Cejka '73



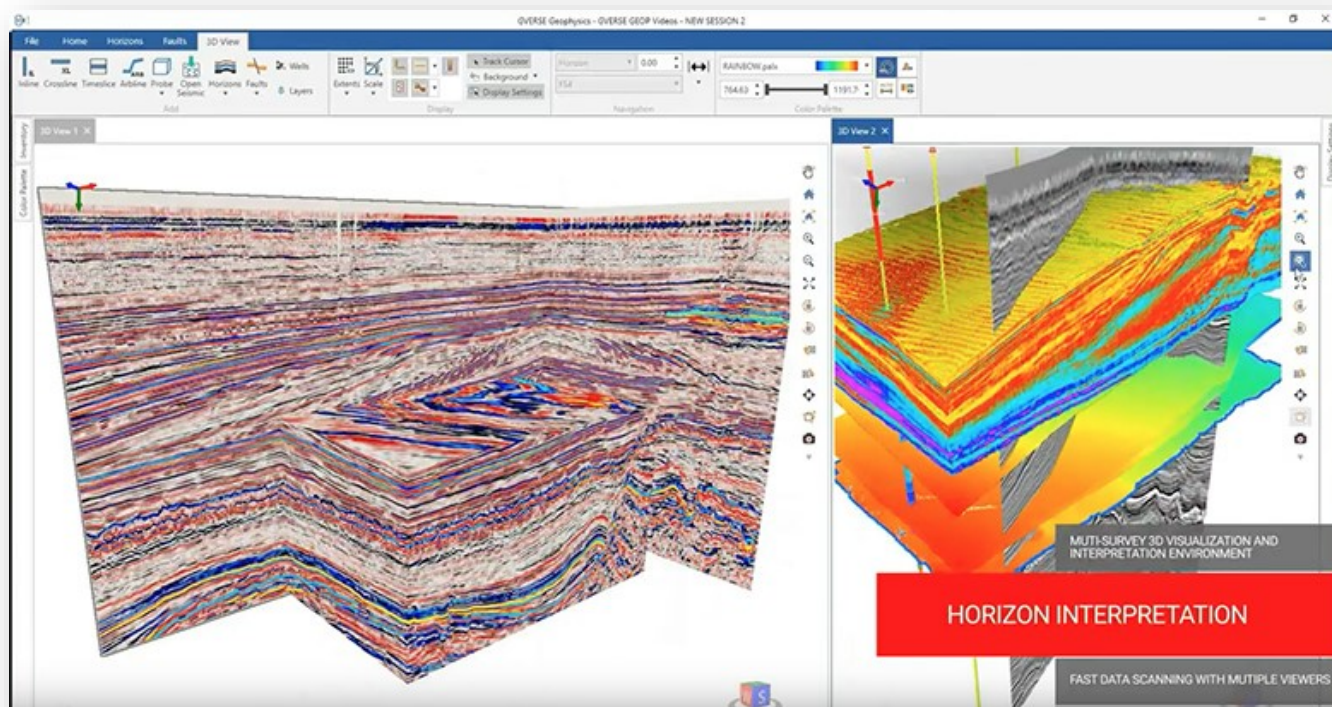
Earlier this spring, IUP alumnus and retired Exxon-Mobil Exploration Company CEO Tim Cejka and his wife, Deb (also an IUP alum), announced a \$2 million pledge to help build our new Science Building. On May 10, 2018 the IUP Council of Trustees approved a resolution to honor this enduring gift by naming the new planetarium and its adjacent atrium lobby in honor of Tim and Deb Cejka. Since their return to western Pennsylvania, the Cejkas have been stalwart supporters of our department and our college, giving generously of their time as well as their financial resources to support the university. We can't thank them enough!

Tim Cejka Joins the IUP Council of Trustees

The Pennsylvania State Senate confirmed four appointments to the Indiana University of Pennsylvania Council of Trustees on October 17, 2018. One of the new trustees is our very own alumnus Tim Cejka '73, who also serves on the College of Natural Science & Math's Advancement Board as well as co-chairing NSM's Imagine Unlimited Campaign.

"One of IUP's strengths has been that the Council of Trustees includes people with various backgrounds and skills," said Samuel Smith, Council of Trustees chairman. "The Council of Trustees are very excited to have Laurie and Tim join us, as they bring two fresh and unique perspectives to help us meet the challenges we have before us. The distinguished resumes that they possess will complement and energize the IUP trustees as we work to strengthen IUP's position in the competitive world of higher education."

IUP Receives \$2.8 Million Software Grant



IUP geoscience students will soon be able to use specialized stratigraphic software for research and class projects. This opportunity was made possible by LMKR, an international petroleum technology company, which has generously provided IUP with its GeoGraphix® and GVERSETM software platform valued at \$2.8 million thanks to the efforts of IUP alumnus Pat Imbrogno '78. IUP will be the only university in the northeastern United States to be able to provide this opportunity to students

LMKR became aware of the department's need for software through a connection with IUP alumnus Patrick Imbrogno '78, a Pittsburgh area geologist and owner of GEO-COM, LLC. Becoming familiar with the advanced tools provided by GeoGraphix® and the GVERSETM platform will help IUP students carry out energy research and prepare for future jobs in the oil & gas industry.

Peter Batdorf, LMKR's territory manager, said "We wanted to provide IUP students with a suite of industry-leading, highly sophisticated and robust tools that optimize the efficiency of petroleum and natural gas exploration and production and that give students an advantage when vying for highly competitive jobs in the oil and gas industry."

Designed to benefit nonprofit academic institutions that train the future geoscientists for the oil and gas industry, the LMKR University Grant Program gives access to some of the industry's most powerful geological and geophysical software packages. The program's goal is to ensure that the best and brightest students enter the work force trained in the technology they will need to be successful in their careers.

Our deepest thanks go out to both LMKR and Pat Imbrogno for making this amazing gift possible!



About LMKR

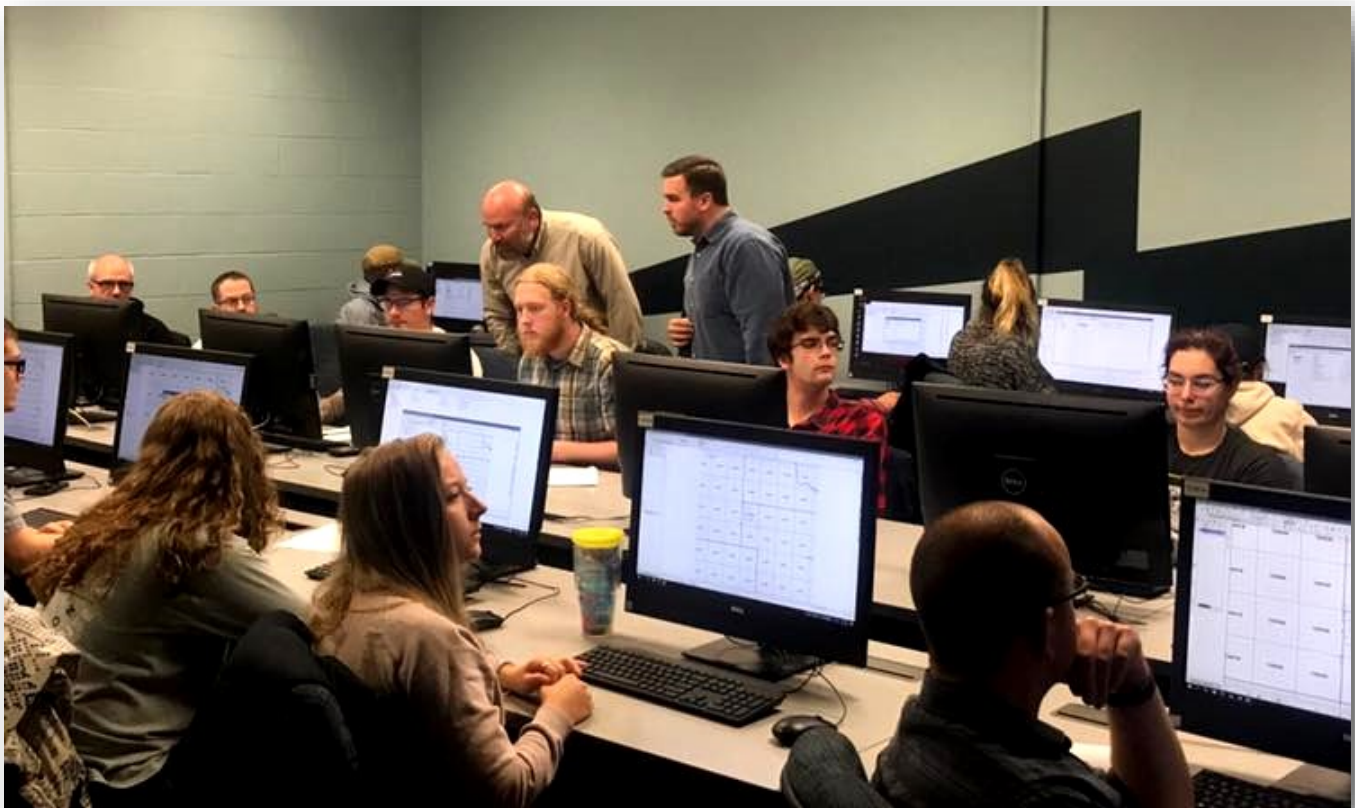
LMKR is a petroleum technology company offering technology solutions and E&P data services focused toward lowering the risk associated with exploration and production of conventional and unconventional resource plays.

GeoGraphix Training at IUP

Following the award of our software grant from LMKR, several IUP alumni visited campus to help us learn how to use this powerful software package. In addition to Pat Imbrogno '78, whose efforts were instrumental in obtaining the software, our visiting 'trainers' were Mike Jarvis '08 (left) and Mallory Zelawski '07 (center), being introduced here by Steve Hovan at the one-day workshop they presented to our students.



Both Mike and Mallory have had extensive experience with the software throughout their careers in the oil and gas industry, and both were kind enough to take the time to travel back to IUP and spend a day training our students and faculty members so that they can use GeoGraphix tools to interpret subsurface data. Dr. Jonathan Warnock (lower right, below) intends to add this tool to his upper-level classes and it will also be used by students working on oil & gas research projects in the future.



New Scanning Electron Microscope at IUP

This summer Dr. Deardorff, along with Drs. Warnock, Lewis, and Hovan of the Geoscience department and several other collaborators at IUP and one from Slippery Rock, received \$425,829 from the National Science Foundation to purchase a Scanning Electron Microscope (SEM) with Electron Dispersive Spectroscopy (EDS), as well as some ancillary equipment. In addition, the School of Graduate Studies and Research at IUP has generously offered to purchase an Electron Backscatter Diffraction (EBSD) instrument to add to the SEM. This instrument suite will greatly increase our analytical capabilities at IUP and significantly enhance the research productivity of our faculty and their undergraduate trainees. It will also allow us to introduce state-of-the-art high-resolution imaging and analytical techniques to our students with an instrument that many of our majors will see and potentially use throughout their careers.

The SEM has long been one of the standard tools for micro-analytical scientific research. SEMs are capable of millimeter to nanometer scale imaging of flat, polished surfaces (e.g., petrographic thin sections) or 3D surfaces (e.g., bone or ceramics) in high vacuum, or more delicate 3D objects (e.g., biological samples) in low vacuum. Although primarily considered to produce qualitative analyses, quantitative analyses can also be completed via image processing using 2D image analysis software to measure attributes such as area percent and particle counts (e.g., determining crystallinity for multiple mineral phases). Additionally, known image magnification provides scale by which surface morphologies and fea-

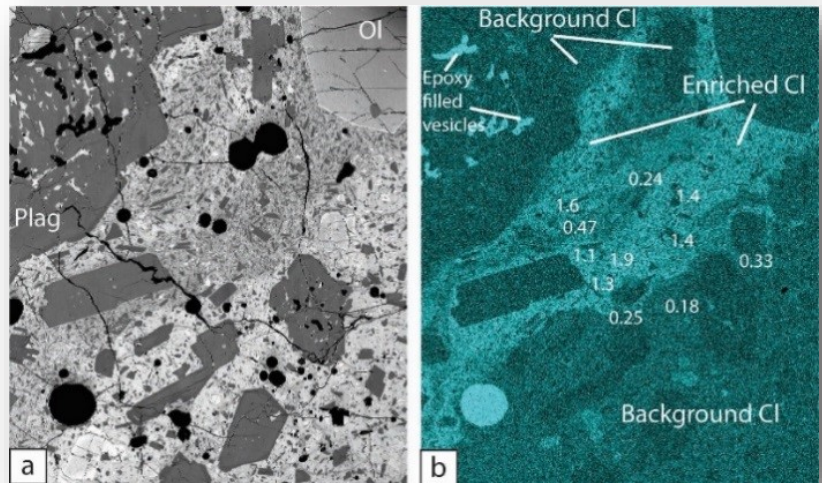


Fig. 1 – (a) Back-Scattered Electron image of microcrystalline inclusion shown as dark diagonal strip from bottom left to top right. (b) Cl x-ray map showing counts of EDS scan. Bright areas are enriched in Cl. Numbers are Cl concentrations in weight % from electron microprobe analysis.

tures may be quantified (e.g., knife cuts on bone by prehistoric peoples; surface features of diatoms).

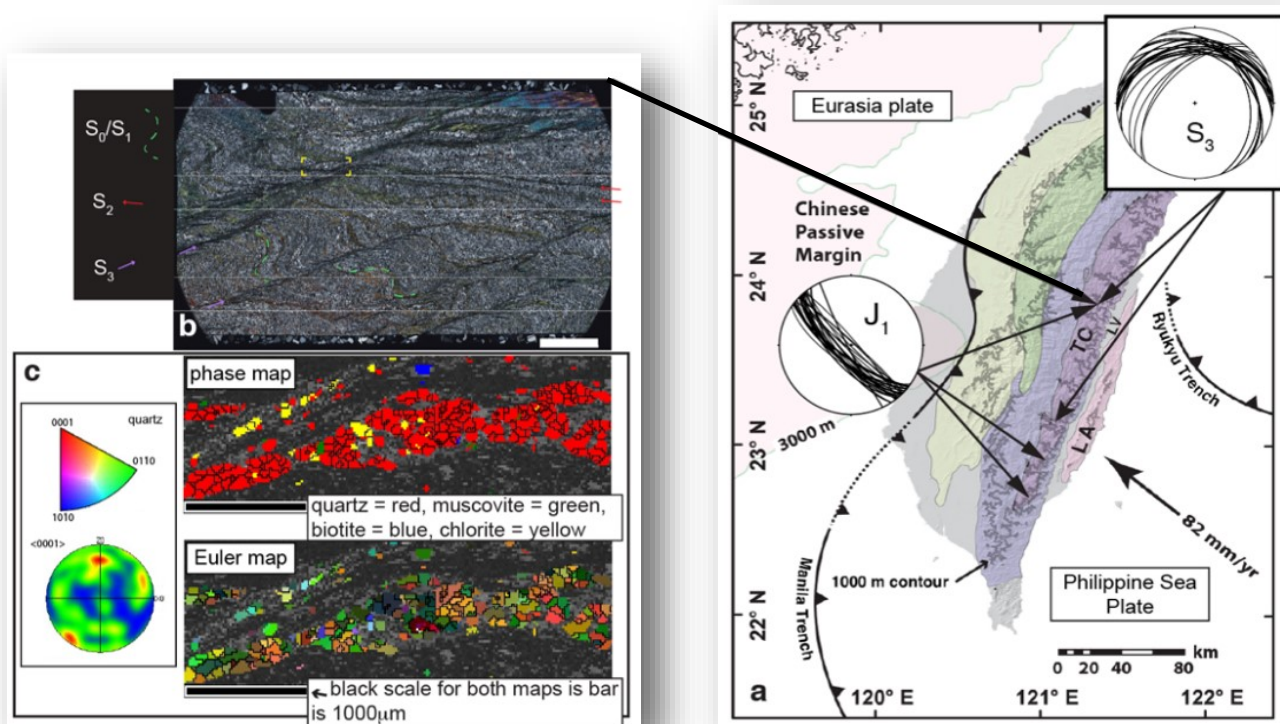
Energy-Dispersive Spectrometers (EDS) analyze X-rays of all wavelengths simultaneously and produce a spectrum of energy intensities with peaks at characteristic energies, allowing detection of elements present within the specimen. EDS can be performed using point analysis to examine a single phase and area scans by rastering or scanning over an area. EDS area scans provide elemental mapping of an area allowing researchers to map relative concentrations and spatial distributions of various compositions (e.g., quartz vs plagioclase, clinopyroxene vs orthopyroxene) or phases (e.g., minerals vs glass). This allows for rapid mineral or particle identification based on subtle concentration variations (see Fig. 1b). EDS is an excellent tool for detection and determining the relative proportions of major elements and for creating x-ray maps of the major elements.

New Scanning Electron Microscope at IUP

Electron Backscatter Diffraction (EBSD) analysis uses backscattered electrons on a steeply tilted sample for optimal conditions to produce a diffraction pattern on a phosphor screen. These diffraction patterns are used to determine a material's microstructure, often for mineral phase identification, grain size distributions, and determination of crystal lattice orientation, commonly as an alternative to slower Transmission Electron Microscopy. EBSD is commonly used in geoscience to (1) assess crystal lattice preferred orientations (LPOs) in plastically deformed rocks, (2) determine mineral nucleation sites and growth directions, and (3) calculate strain or sense-of-shear or mode-of-shear in sheared rocks. See figure 2 for some preliminary work by Dr. Lewis using EBSD.

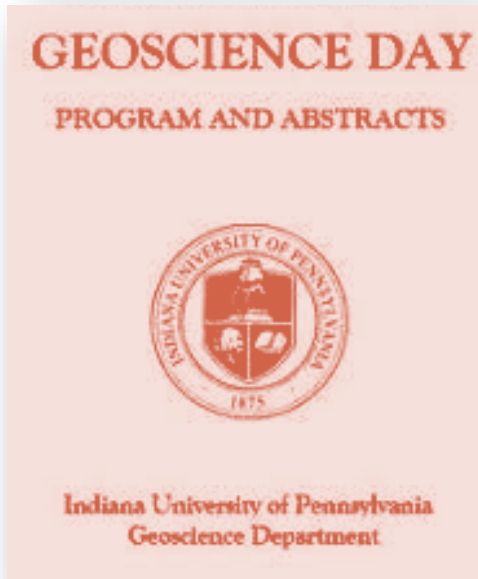
This instrument suite will truly be transformative to IUP research and potentially to the region. It will enhance our research environment by promoting new collaborations on campus, across campuses, and with industry and non-profit partners. We are in the process of purchasing a Prisma E SEM and EDS and EBSD instrumentation from ThermoScientific. The instruments are projected to arrive and be installed in February 2019. Contact Dr. Deardorff if you are interested in using the instrument suite!! And if you are on campus, stop by (location TBD) to check out our new SEM lab.

Fig. 2 Tectonic setting of Taiwan (a) showing lower-hemisphere, equal-area plots of the youngest metamorphic fabric (S_3) and cross-cutting mode-I fractures (J_1) in the Tananao schist (map from Mirakian et al., 2013). The accreted Luzon Arc (LA) makes up the Coast Range, the suture is the Longitudinal Valley (LV) and the metamorphic core is the Tananao Complex (schist, TC). (b) Composite photomicrograph of polished thin section from oriented sample collected along the Shoufeng River. White bar is 5mm long. Yellow outline is area mapped at (c). (c) Preliminary EBSD maps provided by R. Bernard at UT Austin. Upper plot shows phase mapping, lower plot shows Euler map with some suggestion of lattice preferred orientations. Inset at left also suggests quartz c-axis preferred orientation.



Join Us for Another Celebration!

SAVE THE DATE — THE 45TH ANNUAL GEOSCIENCE DAY AND GEOSCIENCE BANQUET WILL BE FRIDAY, APRIL 26, 2019



Alumni are invited to join us for our annual celebration of geologic research at IUP on the final Friday in April. We will once again have our senior research presentations at the HUB Monongahela Room in the morning, where students will talk about research projects ranging from Marsh Creek flooding in Indiana County to dinosaur excavations in Utah. The morning session will be capped off by a presentation from our featured alumni speaker, **Pat Imbrogno '78**.

That evening, the faculty and students along with friends, family and alumni will gather at the Rustic Lodge, to give out awards and honor the graduating seniors. Please make plans to help us toast our 50th year at IUP and 45th Geoscience Day celebration!

A Second Goldwater Scholar for Geoscience

Aaron Seidel, a senior geoscience major has been named a winner of the Goldwater Scholarship, becoming the eighth IUP student, and second Geoscience major, to win the award. The Goldwater Scholarship honors Senator Barry Goldwater and was designed to foster and encourage outstanding students to pursue careers in the fields of mathematics, the natural sciences, and engineering. It is the preeminent undergraduate award of its type in these fields.

Aaron was the only Goldwater Scholar from a PASSHE institution among the 22 Pennsylvania recipients of the award this year. He is a member of the Cook Honors College at IUP and is mentored by Dr. Greg Mount, Department of Geoscience, and Dr. John Benhart, chair of the Department of Geography and Regional Planning.

Aaron has already earned a BS in Geoscience and is currently half-way through the coursework for a BS in Applied Mathematics as well. He is taking classes in environmental engineering now and plans to graduate from IUP in about two and a half years with three degrees. The award will cover Seidel's expenses for the 2018-19 school year. Congratulations on a distinguished academic career, Aaron!



IUP Students Win Research Awards

IUP Geoscience students Erin Johnson, Nicole Lees, and Jillian Mathews were invited to present their senior research projects at a joint meeting of three professional societies in Pittsburgh on April 18, 2018. The IUP students swept three out of the six awards given out by the Pittsburgh Geological Society, the American Society of Civil Engineers, and the Association of Environmental and Engineering Geologists.

Erin Johnson's senior project, "Determining Factors Affecting Flow Rate from Legacy Wells in Indiana, Pennsylvania," was selected as the best submission by the Association of Environmental and Engineering Geologists. Along with students from Slippery Rock and Kent State universities, she was asked to give an oral presentation on her research to a crowd of over 60 professional geologists and engineers.

Jillian Mathews' senior project, "Impacts of Urban Environments on Marsh Run, Indiana County, PA," was presented as a poster and was selected for an award by the American Society of Civil Engineers. Nicole Lees' senior project, "Determining the Paleo-geographical Origin of *Allosaurus Fragilis* from Within the Cleveland Lloyd Dinosaur Quarry (Price, Utah) Using Biogenic Apatite $\delta^{18}O$ Values" was also presented as a poster and was selected for an award by the Pittsburgh Geological Society.

Students from the IUP Geoscience Department have frequently been invited to present their research at the professional student night event in the past, but this is the first time that IUP students have won more of the awards than any other geology program in the tri-state region. Congratulations to our outstanding seniors!



Front row, right to left: IUP Students Erin Johnson, Jillian Mathews, and Nicole Lees.

Alumni Spotlight: Ralph Feather '71



I have retired from Bloomsburg University as a full professor as of June 30, 2018. During my 13 years at BU, I was promoted to Associate and then Full Professor. I received the Provost's Award for Excellence in Research and Scholarly Activity. I continue to write and have been an author, contributing author, consulting author, or standardized test practice consultant on over 70 titles.

I served many years on BUCC (Bloomsburg University Curriculum Committee) and as Chair of the General Education Council. During my 13 years at BU, I served two years as Chair of the Department of Educational Studies and Secondary Education, which then merged with the Department of Early Childhood and Elementary Education to become the Department of Teaching and Learning. The Department of Teaching and Learning in the College of Education has recommended me for Emeritus standing. The granting of this honor is to occur in December. I was also invited as a guest of the BU President and Foundation at our Homecoming Celebration, which unfortunately fell on the same day as the Geoscience Department's 50th Anniversary Banquet.



The photo on the left was taken at the founding of the Eta Omicron Chapter of Sigma Chi Fraternity at IUP. As one of the chapter founders, I am shown on the far right, receiving the official charter from Grand Consul, M. Craig Nason.

The fraternity began as a local organization at IUP in 1969 and received its charter from the national Sigma Chi in 1973. With the four years as a local fraternity, Sigma Chi Delta, our fraternity

has been a part of IUP for 49 years. This means the fraternity has been on campus continuously longer than any other fraternity on campus. We celebrated our anniversary this past November in Indiana.

Editor's Note: Ralph Feather received numerous awards and honors over his distinguished career as a K-12 teacher and university educator. These include: the Provost's Award for Excellence in Research and Scholarly Activity at Bloomsburg (2009), the Outstanding Teacher Award from ACEI (2008 and 2007), Teacher of Distinction (2000), the Presidential Award for Excellence in Science Teaching (1991), the Award for Excellence in Earth Science Teaching, GSA (1991), and the Outstanding Earth Science Teacher Award, NAGT, Eastern Section (1984).



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John Repetski '69

New job? Does retirement count? I went Emeritus this past January. Keeping my labs, office, etc., so now I'm going to USGS about 5 half-days per week, working on unfinished projects (including co-projects with fellow alumni Dr. Taylor '75, Jim Loch '83, and Dave Brezinski '77), involving Alaska, US Great Basin, and Appalachians. Importantly, I'm trying to curate and protect the USGS 100+ years of conodont collections, reprints, etc., and hoping that the USGS wises up and hires another conodont researcher. You can't map or thermally evaluate bedrock, surface and subsurface, without 'ground truthing.' And you can't age-date sedimentary rocks better than with their fossils. Finally, AI has not advanced to the point that conodonts (or most fossils) can be found, extracted, sorted, and identified / analyzed without human eyes, hands, and brain.

Really enjoyed my Homecoming trip to IUP and visiting with students, staff, and fellow alumni. My favorite 'treat' was seeing Mr. Park and Connie Sutton, whom I will always thank for teaching me not only the 'pet' scope and planetarium, but for being so instrumental in launching my interest in geoscience. Whoa, you can make a career and get paid for doing what most folks have to wait to do on vacations! And, it's useful and important, too!

Happy holidays and best wishes to all for 2019!

T.R. Moore '76

This past Winter Semester (no, I'm not going to call that "Spring Semester") I taught an Intro to Geology class for the folks at Bethany College. Not having done Intro since my days as a teaching assistant decades ago, I will be forever thankful to Karen Rose Cercone for giving me a wonderful set of PowerPoint slides, a tip on a good textbook and other assists. Of course, I had to add to the PowerPoint slides to bring it up to my usual student "Death by PowerPoint" lectures. It would have helped if at least a majority of the students had bought, rented or even borrowed from classmates

the textbook. That and bother to come to class. The over all "experience" was something I am unlikely to repeat, even if it was half the drive for me from Waynesburg as it is to Indiana for IUP classes. Consulting has been slow, but then 1) I have not been really beating the bushes for work and 2) most of my peer contacts took retirement or changed jobs when the downturn hit about 3 years ago, and my networking did not keep up.

"Slowly I turn. Step by step..." marching toward something like real retirement. I just ordered up the paperwork to take my been-waiting-all-along pension from Phillips Petroleum (the 22 years that ended the last day of December, 2002). Medicare paperwork comes next, so that I can stop making sizeable contributions to the UPMC robber barons monthly and go back to my preferred doctor that they wouldn't let into their network since he is tied in with WVU Medicine. (Highmark is not the only competition they are trying to push out.) Then, I can start getting something back from years of taxes, maybe, if not bilked out of it by today's politicians. That and other potential outrages have led me to more involvement (all in the background) in local grassroots politics. Don't assume that my politics align with most of the oil and gas industry types, but I won't foist any of that on you here.

Muffie is still fully engaged caring for her mother. Mamma will be 100 in mid-December; tough old Missouri farm girl. Son, Duane, aeronautical engineer for Bombardier in Wichita, Kansas, is about to finish up with the flight testing of their new Global 7000 corporate jet. He had to complicate the grind at work by moving to a different house, with a small acreage, in the local area there. I got to help with the move--as if I haven't done enough of that over the years. (We got it done a whole lot faster than getting Dr. Taylor out of his lab and office in Weyandt will take, with much less whining. He'll probably try to stretch 50 years into 100.) Duane's wife, Kaley, and the three young ones, Gabriel (8), Lydia (6) and Eli (3), are enjoying the new digs. Daughter, Aileen, as well as her husband Nathan, work for the Arvest banking system in Northwest Arkansas. She's in the trust department,

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helping all those rich, early Walmart investors. She does volunteer work for the Crystal Bridges Museum of American Art, so I guess the fine arts degree is of some use to her.

Pat Imbrogno '78

The Imbrognos took a trip to Italy last summer. Planes, trains and automobiles! We visited the food makers in Bologna, Leather jackets for the ladies and the statue of David in Florence. A wine tasting lunch in the Tuscany area was also enjoyed. Of course we visited Rome and saw the sights. But the main reason for the Imbrognos was to get back to our ancestral homeland in Alta Villa Calabria! We saw a 700 year old church my great grandfather carved the alter for! It was great to see. After four days on the Amalfi coast and a trek up Mount Vesuvius it was back home again. A great experience.

Terry (Kohler) McConnell '80

I'm still working as a permanent Adjunct Professor at UPJ. Last March during spring break we took the Geology Club to Scotland. An amazing trip even though we couldn't confirm a sighting of Nessie at Loch Ness.



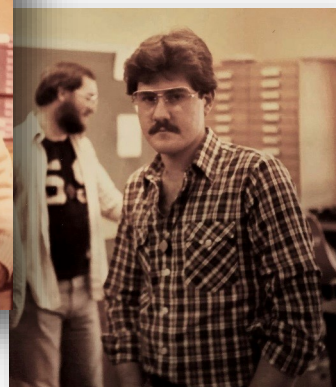
Cate (Grube) Brier '81

My family and I live in Chillicothe Ohio. I'm retired for now. I have one daughter in college majoring in Music Education and another daughter who is a Junior in high school.

I found some old photos of students in the department from about 1980. The first shows Ron Andzeli '81, Jeanne Renig, and Bruce Brown '80 in the Mineral Room. The second one is of Gary Neuder '82 and Mark Ios '81 in the Paleontology Room. Enjoy!



OLD SCHOOL COOL



Gary Smarsh '81

I enjoyed being able to attend the IUP Homecoming activities again and in particular, the 50th anniversary of the Geoscience department. It was very nice seeing the professors who all helped me achieve my Geology degree way back when, which allowed me to enter the work force in multiple disciplines (oil/gas industry, Geotechnical, coal waste, & finally groundwater/environmental along with a PG status in both TN & PA-currently inactive). I was caught off-guard when Dr. Taylor called out my name as was TIM Nuss when his young picture was shown! Ending employment with the NJDEP eventually helped me retire early and am now just using the free time to determine what to do next including returning to the best part of the state, Western PA. During this time, recent trips back to Gillette WY and Death Valley/SoCA have taken place where I had the opportunity to reside

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while working for Dowell in WY and schooling in CA at Whittier college for their winter/spring geology camp. Our trips back to Death Valley now include pedal biking through the contiguous states largest National Park/no one else there in February!

Jeff Miller '92

Last year my wife Anne and I moved back to Tasmania, Australia to work for the Australian Antarctic Division. Anne (B.S. Geology, University Of Michigan) is currently at Casey Station studying impacts of hydrocarbon contamination, I work for the Operation Group conducting annual resupplies of stations via icebreaker. During the much more boring off season I work as an environmental consultant in Hobart. Anyone visiting Tasmania should give us a hoiy at milljeff888@hotmail.com.



The resupply voyages have enabled me to see some wonderful places. My favorite destination so far has been Macquarie Island, a UNESCO World Heritage Site where Australia maintains a small research station. Besides its incredible wildlife, which includes 3.5 million breeding penguins, albatross and other seabirds, and over 80,000 elephant seals, it is geologically fascinating as well, being the only place on earth where rocks from the earth's mantle are being actively exposed above sea level.

While I failed to get any cool pictures of pillow basalts or other extrusives, the local wildlife provided plenty of wonderful shots.



Jen (McCardle) Copperthite '94

This year has brought a lot of changes for me and my family. After teaching at Fauquier High School for 24 years in Warrenton, VA, we moved to Huntsville, AL. My husband works for Aerojet-Rocketdyne, and they shut down the Gainesville, VA offices and moved us here. Our oldest did stay behind to continue his engineering studies at Virginia Tech. I have decided not to go back to teaching, but I'm currently in the process of being hired at Space Camp as an educational presenter!



We spent Thanksgiving in Vegas, and our family has a tradition that everyone gets to choose an activity while away. I chose visiting Red Rock

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Canyon right out of the city. My kids have really never taken a vacation, but they have been on many educational field trips. Both of my boys took my earth science class, but they got a refresher course. We also discussed aquifer issues in the Vegas area while visiting the Hoover Dam.

Aaron Hicks '94

To the surprise of absolutely no one, Aaron now runs a cannabis analysis lab in Phoenix, Arizona. He and Lisa enjoy the company of retired racing greyhounds, and several hundred thousand baby orchids in sterile tissue culture.



Barbara (Osgood) Kutchko '97

I have two exciting new developments to report. First is that I am a ***Society of Petroleum Engineers Distinguished Lecturer*** this year. This means I will be traveling around the world giving lectures on my research on foamed cement. Here is an article that my doctoral institution, CMU, wrote about it:

<https://www.cmu.edu/cee/news/news-archive/2018/11-2018-kutchko-named-spe-distinguished-lecturer.html>



It's going to be grueling but exciting.

The second news is that I was a finalist for the Samuel J Heyman Service to America Awards. The Sammies are named in honor of the Partnership for Public Service's late founder who was inspired by President Kennedy's call to serve in 1963. I didn't win but it is an incredible honor just to be nominated and then make it to the finalist category. Here is more information:

<https://www.energy.gov/fe/articles/netl-s-barbara-kutchko-named-finalist-samuel-j-heyman-service-america-medals>

My work continues to be exciting. I work with an amazing group of scientists who are not only wonderful colleagues but many have become my closest friends.

Mark Zellman '99

It's been a few years since I last sent an update for the newsletter, and since then a lot has happened. I've changed jobs and I'm now working for BGC Engineering in Golden, CO. BGC is a Canadian-based company that specializes in engineering geology and geologic hazards, mostly for midstream oil and gas and mine-related projects. The bulk of my work still includes Quaternary geology, seismic hazards, and landslides.

In addition to the BGC project work, I continued to be involved with research of active faults. The Colorado Geological Survey just published our report on the Cheraw fault, which includes new mapping and results from a new paleoseismic trench. I've also been involved with research on the Teton fault in northwestern Wyoming. Over the past few years I've been part of a research team that has remapped the fault and opened 7 new paleoseismic trenches to answer questions about the timing of large surface rupturing earthquakes, rupture length, and slip rate. Most of our trenches were opened by hand, with shovels and picks, except for one very large USGS-funded trench at the Jackson Hole ski resort.

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We'll be opening another trench in August 2019 at the southern end of the fault. The work has been done in partnership with researchers from the USGS, Idaho State, and Wyoming Geological Survey. I just started a phase of the study that includes partners from Occidental College and University of New Hampshire that is funded by an NSF grant to evaluate roles of active tectonic and climate on the landscape evolution of the Teton Range. One really interesting aspect of this study is that we'll be using high-resolution ages of disturbance intervals in lake sediments (which provide indirect evidence strong shaking) to better -constrain the coarse ages from paleoseismic trenches (which provide direct evidence of large earthquakes). This should improve our overall understanding of timing of big earthquakes since the late Pleistocene.

In other news, my kids continue to grow like weeds. They are now 5 and 3 (almost 6 and 4), and they excel at keeping my wife and I exhausted. As for my wife, she is wrapping up her PhD and is ready to collect her silver diploma from the Colorado School of Mines. She'll be defending her work on the Paleocene-Eocene Thermal Maximum in early January, and then we'll be celebrating...hopefully with a trip to Hawaii.



I've attached a photo showing the view from our paleoseismic trench on the Antelope flats fault on the east side of Jackson Hole. The views of the range front were great, but it was so hot!

Bryan Sell '00

My family (wife and four-year old son) has happily settled in Vermont with a home on a green mountain just off the Appalachian Trail. Life could not be better.

My professional life continues to flux with respect to my family obligations. One of my jobs is part-time geology faculty at Castleton University. Currently my students are suffering through my first attempt at teaching mineralogy, which is more or less that same as I remember at IUP. It is one of these courses where it is impossible for most students to understand any of the broader implications, so the students memorize everything and hope for the best. It is as challenging to be a good teacher as it is to be a student in this class. Maybe even more so for the teacher as I now see the core concepts of mineralogy being fundamental to how we come to know, not just interpret, facts about Earth.



Among my many other career pursuits include my new gig as executive director of a non profit where I've been throwing myself into trail advocacy. The parallels with academic geology are striking to me: I'm still working with rocks, thinking about natural history and environmental impact, begging for money, collecting and analyzing data, and politicking for low-stakes gains. The last part is still frustratingly inconvenient, but acceptable because I get to be in the forest every day and spend plenty of time with my family.

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Greg Anthony '01

I am still Active Duty with the PA National Guard in Johnstown. I will be able to retire from Active Duty in less than a year, but see myself staying a little longer. One of the great things about being a pilot is getting a large scale view of some of the topography of our beautiful state. Some of my favorite areas are within the valley and ridge province east of the Allegheny Front. However, one of my favorite routes takes me down to the Seneca Rocks Formations in West Virginia. I try to make it an informative flight for my crew (as seen in the picture on the right).



The other notable news is I started my own business: [GACustomBlades](#). I enjoy the process of designing and making knives. My wife Kristy has been keeping myself and our son Hayden straight. Other than that, life continues in Western PA as normal.

Steve Smith '01

Our 2018 did not have the normal long travel that previous years had, but it was still busy enough. We are all doing well, and hope you are doing well. Our daughter Aurora is making it through sixth grade - middle school - at Porter Traditional School. She still enjoys reading as she got into the Harry Potter and Fantastic Beasts stage this year. She is still excited while learning about the history and science subjects. Aurora has also bridged into being a Cadet Girl Scout.

My wife Kate got a full time position this year as a special education teacher's assistant at Covington -Harper Elementary School, in Virginia. She is still involved with Girl Scouts as a leader for the troop of Cadet Girl Scouts that Aurora is in. Kate is still the cookie mom, so things will soon get crazy around here with so many cookies.

Meanwhile I have continued to do some Civil War reenacting and living history events with my group, the Liberty Rifles. This year the living history schedule included Saylor's Creek, Virginia; Brandy Station, Virginia; the anniversary program at Gettysburg, PA; and the Remembrance Day program at Gettysburg, PA (right).



The Honor Flights have also been a staple for the yearly activities. There was even a new item to participate in: being the photographer for the Society of the Honor Guard Tomb of the Unknown Soldier Reunion in Washington, DC in early November 2018.

Two of the better trips this year, were heading back to IUP for Geoscience Day in April and then attending the 50th Anniversary celebrations and Homecoming football game in early October. It was great to see all the awesome research being done these days and to also see some fellow alumni that I had not been able to see in years. Always a good time.

This year, there was no big family vacation due to having to replace our fence at the house and also getting a new driveway along with it. The new fence also required four trees to be taken down along a part of the existing fence line. There were still eight other trips to Pittsburgh to see family

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members and to attend a 40th birthday party, be the photographer for a cousin's wedding, and a family reunion on my mom's side.



Kate and Aurora also got to go to California to visit her sister and then took a trip to northeast Pennsylvania to see another sister, then headed to Massachusetts to visit her best friend. The planning is almost beginning for next year's family trip to Colorado. Some stops will be courtesy of some discussions with travelers to the IUP Geoscience Department's Rocky Mountain trip from summer 2018.

Our pup Jolly Roger turned three back in November, and has been as spoiled as ever. He made several trips to Pittsburgh with us this year, and has held his own with his buddy Thor. He has been sleeping with Aurora for a good bit of the year, so that has been great on everyone.

Joe Biondo '07

I left Pilot Thomas Logistics back at the start of 2017. The travel was taking a toll on my family. I went to a local company, Ligonier Construction as the Director of EHS. Under Ligonier, I oversee the Environmental Health and Safety of Ligonier Construction, Ligonier Trucking, Blacklick Energy and Pipeline Services, Derry Stone and Lime, Ligonier Concrete, and Bullskin Stone and Lime.

I occasionally run into my graduating classmates as they are working for EQT and Range

Resources as Geologists. Personally, I now have a 3 1/2 year old daughter Jessa, and a 1 1/2 old son, Dominic. The market in the area has seemed to stabilize for now with Oil and Gas prices. Hope everyone had a wonderful Thanksgiving and a blessed Christmas Holiday.

Kalin McDannell '08

2018 has been a whirlwind, last year my wife Jennifer and I (and our dog Juneau) moved to Calgary, Alberta where I accepted a postdoctoral position with the Geological Survey of Canada.

I have been working on a large Canada-wide project to determine the burial and erosion history of the Canadian Shield over the past 500 million years using thermochronology. It is quite a task, as the majority of those sediments are missing! I have been busy writing papers and just recently attended a conference in Germany. I'm also on the lookout for a tenure-track faculty position and have my fingers crossed. We love Calgary and it is a great city, the mountains are nearby and provide a great getaway to go hiking and relax in the Rockies.

Here is a picture of us at Lake Louise:



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Jeff Dereume '08

I am still employed at EQT in Pittsburgh, Pennsylvania, and continue to work in our asset development engineering group. After moving out of our geology group, I've spent the last year and a half focused on long term volume forecasting, long term resource forecasting, and developing and achieving corporate growth rates. With a restructuring of my working group following the split of EQT production and EQT midstream, I will now be working in our capacity systems planning group, working to ensure our development achieves the most favorable commercial gathering rates.

This past June I graduated from Robert Morris University with an MBA in finance. While this degree was particularly challenging, it has paid dividends in my split role with EQT. In September, my wife Kathryn, 2-year old daughter Evie, and dog Loki moved out of Lawrenceville after having spent 10 years in the city. It has been a slow adjustment living in the suburbs, but we are enjoying some room to roam and our garage.

Ellen Lamont '12

Namaste! Greetings from India!

This year has been one amazing ride full of change, challenges, learning, and exploration. As part of my doctoral research, in August, I uprooted and moved to India alone for a year where I am serving as a Fulbright-Nehru Research Scholar at the Wadia Institute of Himalayan Geology, Dehradun. If you are unfamiliar with the Fulbright program, it was established in 1950 by then U.S. Senator J. William Fulbright as a form of cultural and academic exchange between participating countries and the United States. The goal was to send "cultural ambassadors" between the countries to foster mutual understanding, respect, and ultimately peace. Since it's humble beginnings, it has grown and currently awards over 8000 fellowships to scholars in 160 countries. The activities of scholars range from conducting independent research or working in public health

to teaching English or leading short university-level courses and workshops.



Right, so what am I doing here? Well, when I'm not indulging in road-side chai, eating fragrant marsala dishes, shopping in the beautiful fabric markets, and exploring the rich cultural legacy across this diverse countryside, I am either in the office or out in the field investigating mountain range growth and evolution. The Himalayan Range can be broken into four major regions: the Tibetan Plateau, the High Himalayas (these are the iconic mountains), the Lesser Himalayas (the High Himalaya's large but less impressive brother), and the sub-Himalayas (the small foothills at the front of the range). My work is centered in the fourth, the sub-Himalaya.

If we consider that mountain ranges form by the progressive forward rupturing of new, stacked thrust sheets over time, then in a simplistic case, the foothills region of a range should represent the youngest growth of that range. Given that the Himalayas are active and have been for the last 20+ Ma, I am interested in how the growth of the range in its youngest portion has been affected, or not, by the rapid change in climate over the last 5 Ma. Climate has a direct impact on the erosional processes acting on a mountain range and thus has the potential to redistribute relevant forces and

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loads that control how the range develops or evolves. This has direct implications for hazard potential and mitigation.

Conducting research in India has been interesting, fun, and rewarding. The researchers and students at Wadia are experts in their respective fields and a great wealth of information. Their availability and willingness to help has been invaluable. The most exciting part however is interacting with the locals while doing fieldwork. In many places, the locals are intrigued about why a group of young people and foreigners are staring at rocks and are not shy about coming up and asking what you are doing. Many know English and are excited to ask me directly, but others will have conversations with my guide/assistant.

In the more remote places, few foreigners have entered their village in the recent past, so within only a few minutes the entire town emerges from their homes to follow us around like celebrities. In these places, the number of selfies I've been in with the local youth is immense. It's hard to enter any town without receiving a dozen or more invitations for chai and snacks; most of which we deny graciously. Other times, I spend more time fighting with the local monkey population than looking at the geology! I recently finished the first of three planned field expeditions, the final to conclude sometime in January (depending on when the snows arrive).

My Fulbright-Nehru Fellowship is set to end in the summer of next year, after which I will return to Oregon State University to process collected samples and write my dissertation. If you are interested in following my travels and my work, I am keeping a travel/research blog here: (<https://instructuralgeologyindia.wordpress.com/>). I am also happy to answer questions about my work or the Fulbright program as well — just email me at lamonte@oregonstate.edu.

Aaron Blair '13

I am almost through my third year with the U.S. Environmental Protection Agency (EPA) based out

of Philadelphia. My responsibilities at EPA revolve primarily around assisting state and federal agencies in developing Environmental Impact Statements (EIS) in accordance with the National Environmental Policy Act (NEPA). I focus on energy and infrastructure projects in the Mid-Atlantic region, which generally consists of interstate natural gas transmission pipelines, hydroelectric dams, and inter/intra state highways.

Recently, I was awarded a grant to work on a project with EPA colleagues at the Office of Research and Development in Newport, Oregon. I got to explore the beautiful coastal Oregon geology (photo is of Cape Lookout Beach, OR).



This was also great opportunity for me to visit EPA staff in a lab setting, to learn more about what they have gleaned through years of research on human health and ecosystem dynamics, and to determine how best to use this research in the Mid-Atlantic region. The ultimate goal of this project is to improve methodologies in the NEPA decision making process to better account for the economic goods and services provided by natural resources. We hope to publish a paper on our work in the near future.

On a personal note, my fiancée and I are looking forward to visiting the limestone cliffs of Thailand in two weeks to do some peak season rock climbing with friends!

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Dan O'Hara '14

This year has been an extremely productive one for me. I co-authored one paper that compiled and analyzed the geometry of different volcanic landforms (agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2017JF004369); and finally published my first primary-author paper, looking at how localized topographic perturbations (such as volcanics, or large landslides) can affect long-term landscape development (www.sciencedirect.com/science/article/pii/S0012821X18306575).

I also got the chance to explore much of Germany through a 3-week workshop on surface dynamics (highly-recommended to anyone who is interested (mres.uni-potsdam.de/index.php/2017/07/31/summer-school-2018-on-earth-surface-dynamics-part-1/)); and returned to IUP for a short visit to give a presentation on my research and talk with undergraduates about grad school.



Dan catching up with his former professors.

Finally, I interned at the Cascade Volcanic Observatory (part of the USGS) over the summer through the NSF Graduate Research Internship Program (GRIP), with the main goal of compiling and analyzing volumes of Quaternary volcanic edifices throughout the entire Cascades Arc (results of which will be presented at AGU 2018).

Currently, I'm planning to graduate from the University of Oregon with my PhD this coming summer. As such, I've mainly been playing the job-hunting game over the last couple months, with a focus towards professorships, postdoctoral fellowships, or government scientist positions.

Sage Wagner '14

Everything is going really well here in Texas. I finished up my MS at Eastern Carolina University and quickly found a job mudlogging. Great learning experience but not too keen on living conditions. Since then I've married the love of my life and have landed a great opportunity working for Terracon Consultants as a Staff Geophysicist in Midland TX.

We've been doing a lot of seismic work for wind farms and I have had great opportunities to manage/co-manage remediation projects for Plains Pipeline. Overall, I'm really pleased with Terracon. Solid safety culture and great work environment. We did 7 million in business last year with less than 30 employees on staff!

Sierra Davis '15

I graduated from the University of Rhode Island with my Master of Science in Oceanography in December 2017. My thesis and research there focused on coastal processes, including the use of remote sensing tools like LiDAR and side-scan sonar to monitor shoreline change along the southern shore of Rhode Island.

After graduation, I had the opportunity to compete for a NOAA Coastal Management Fellowship position and was awarded a position in Delaware. This is a two-year fellowship for post-graduate students interested in coastal management at the state level. I am working for Delaware's Department of Natural Resources and Environmental Control in Dover, Delaware.



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My primary project is to develop a methodology for prioritizing state-funded dredging projects. I have also assisted with other projects including coastal bathymetric surveying, creek fish trawls, beach nourishment permit applications, and biological monitoring of Delaware's marshes.

Although I've strayed a bit from traditional geoscience, I was reminded of my educational roots during the 50th Anniversary of the Geoscience Department earlier this fall. This event felt like coming home to see family and was a chance to say a final goodbye to Walsh Hall, learn about the new science building, and reminisce about the foundation that IUP built for me and so many fellow geologists.

Jon King '16

Currently I'm in Zambia serving in the Peace Corps as an RAP (rural aquaculture promotion) volunteer. I stay in the Southern Province in the village of Mubiana about 60 km north of Livingstone which is home to Victoria Falls!



I have learned to speak some of the local language, Tonga. There are 12 or so major languages but tons of dialects and niche languages. I can get around in Tonga but I probably speak like a kindergartener. In terms of day to day, most of it is spent maintaining my home, doing chores like fetching water, and visiting farmers.



Progress is a lot slower than I anticipated which just seems to be a side effect of development. I'm bringing in fish farming as something new to the village and its going to take time for people to be ready to try it. Luckily there are a couple really motivated farmers that keep me busy always wanting to try new things like agroforestry and beekeeping.



Other than fish farming RAP volunteers branch into other work as well like agroforestry, HIV/AIDS education, and gender work. I'm currently trying to start a women's' club in order to teach them some new income generating activities and maybe we'll start a village banking system together.

It sounds like a lot but I would be lying if I didn't say it was all very slow. Several times people don't show up to meetings or say they will do something but don't. Peace Corps is a rollercoaster of highs and lows, so much so that they give you a little chart about it in the first week

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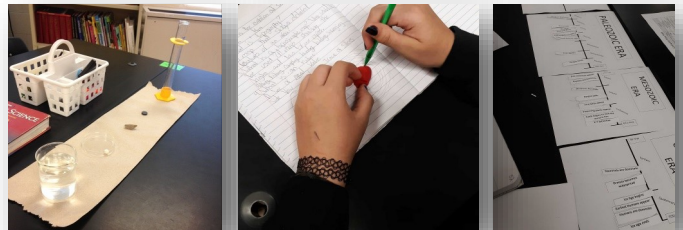
of training. However, I've been enjoying this experience for the most part. This is a good option for new college grads that want to see another piece of the world and get a taste for international development work. You learn a lot about yourself and the world in Peace Corps!



‘ Twalumba kupati!

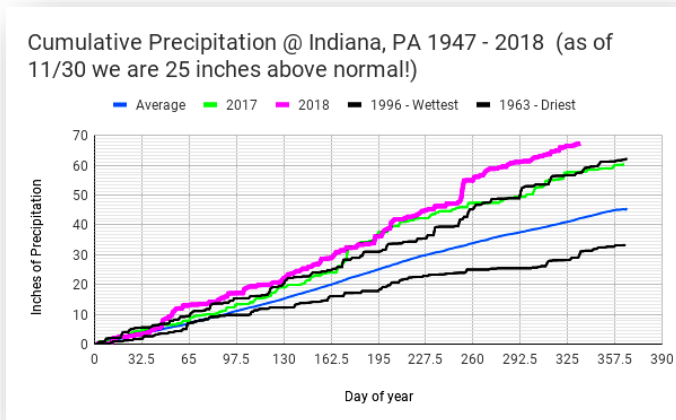
Rebecca Haase '17

This is my second year at Altavista combined school teaching 8th grade earth science. The pictures show some of the lab activities we have done so far in class. Things are going great in Virginia!



2018 Looks Like a Record Year for Rain in Indiana County, and IUP Geoscience Students Are Keeping Track of The Impact!

As some of our alumni already know, 2018 has been a year for the record books when it comes to precipitation rates for our area. This has contributed to on-going flooding and other stormwater issues in local watersheds, including Marsh Run. On the plus side, our stream research group under the direction of Professor Katie Farnsworth have had a lot of material to work with for their projects.



The three-day symposium included talks and poster presentations on a wide range of subjects, highlighting the interdisciplinary nature of science in the region. Kayla's presentation was in a session focused on runoff that included speakers from the US Geological Survey, the Erie County Health Department, and the National Weather Service. Her talk was titled "Researching Stormwater Runoff at the White Township Recreation Complex in Indiana County, Pennsylvania."

Geoscience student Kayla Kroczyński '19 presented her ongoing research on stormwater runoff at the 14th annual Regional Science Consortium Research Symposium on November 7, 2018. This symposium showcases the work of members of the Regional Science Consortium at Presque Isle.



Faculty News — Karen Rose Cercone

Karen Rose spent the past year engaged in a lot of student learning assessment work. For those of you who are not academics, that means proving to outside evaluators that we professors are actually teaching students what they need to know in our classes!



A year ago, Karen Rose was invited to be part of the new Teamwork Studies minor at IUP, a curricular initiative which was funded by a four-year NSF grant. Since then, she has been coordinating the learning assessment results from the courses that students take in this minor to help them work together in more effective teams.

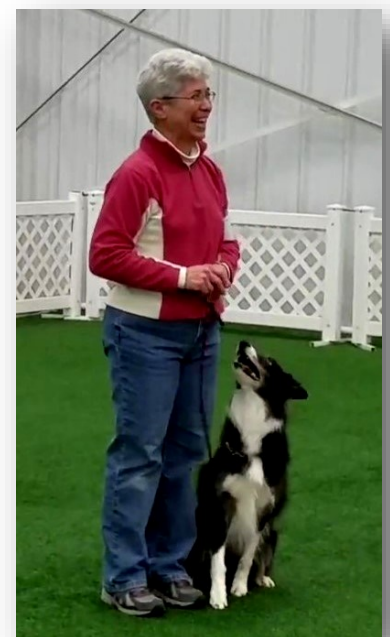
Karen Rose has also been helping the IUP Provost's Office get a university-wide program assessment database up and running this past year. This was one of the requirements for IUP after its last accreditation by the Middle States

Commission on Higher Education. The project has been so much fun that KR has agreed to serve a term as the Provost's Associate for Academic Programs and Planning next year, in charge of student learning assessment at all levels, from Liberal Studies introductory classes to academic program reviews.

Karen Rose will still be teaching introductory lectures and labs for the department, as well as the senior capstone Geoscience Seminar class (in conjunction with Ken Coles this coming spring). She will also take charge of our upcoming program review in 2019-2020, but she will be handing some of her other departmental duties over to the 'young folk' as she prepares to retire in another year or two.

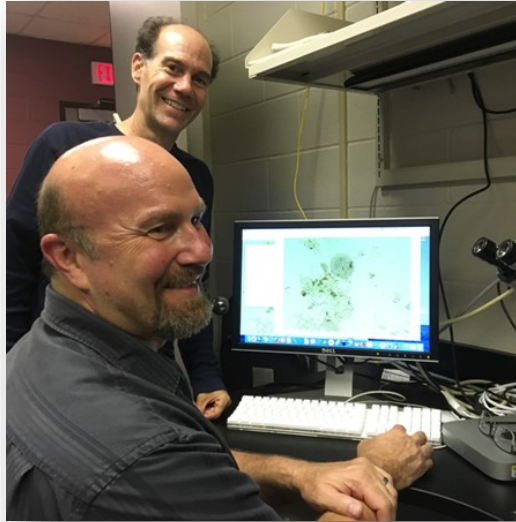
In the spring of this past year, Karen Rose and Julia traveled to Scotland, the Shetland Islands, and Iceland. The highlights of their trip were the columnar basalts of Fingal's Cave on the Isle of Staffa (left), seeing James Hutton's angular unconformity at Siccar Point, and watching real Scottish border collies work sheep at the Great Glen herding trial.

With her own border collies, Karen Rose has been showing mostly in obedience trials this year. She is happy to report that ten-year-old Darwin (right) earned his Companion Dog Excellent title this fall with two first place ribbons. (We won't mention that no other dogs qualified in his class.)



Faculty News — Steve Hovan

Hovan enjoyed a slight break from the teaching schedule last year completing his third sabbatical during Fall 2017. But this time, he wised up and worked with a colleague at the University of Kauai (Dr. Stephen Taylor) where they began to build a teaching/research program for undergraduates that incorporates micropaleontological



records from the deep sea to enhance their understanding of how scientists approach global records of climate change. As part of a larger curriculum involving global climate history, students will process and examine sediment cores for evidence of glacial events recorded throughout the oceans (even in the tropical Caribbean Sea). Hovan is deeply grateful to his host for his hospitality during his sabbatical and for helping him to secure accommodations along the eastern shores of Kauai complete with a set of very friendly wild boar that greet him each morning looking for leftovers from breakfast!

Upon returning to IUP, Hovan continued efforts on his two main research projects: a) deep sea sedimentary records of climate change and b) understanding environmental issues associated with “legacy” abandoned oil/gas wells in Pennsylvania. Working with teams of students from IUP and Indiana High School, Hovan expanded data collection on cores from KN223 recovered from the subtropical Atlantic Ocean floor. Students are looking at several proxy records including carbonate content, stable isotopes, and dust flux/size to characterize changes during key intervals of climate transitions over the last few million years (e.g. develop-



ment of northern hemisphere glaciation during the late Cenozoic and cyclical changes in ice volume). Hovan also continues his work with partners across campus and at the DEP trying to address safety and environmental concerns about methane emissions from abandoned “legacy” wells that are scattered throughout western and northern PA. With support from SAFER-PA and the PA Dept. of Economic and Community Development, Hovan and co-PI Bob Wilson (IMAPS) completed work on **WELLMapper**,

a new phone-app tool designed to give the public easy access to PA’s inventory of oil and gas well locations and provide a way to share the location and condition of the large number of abandoned well locations currently unknown and/or not included. The hope for this project is to vastly increase the number of abandoned wells included in the database and thus provide new data about their environmental condition thereby helping the state to prioritize efforts to properly plug them.



Apple

Android

And finally, Hovan recently began working intently on a new effort to recruit students directly into SMET at very early stages in their academic career.

Hovan has made several visits to the Chicago area where he has focused on a promising young scientist named Leo Alexander Lee, born in early August. The data are too early to determine the effectiveness of these efforts, but he’s committed to the project and will keep you posted!

Faculty News — Jon Lewis

Jon Lewis is continuing to stay busy with the usual mosaic of activities that constitutes an academic career. On the teaching front he had the good fortune to work with Drs. Deardorff and Hovan to teach Geology of the American Southwest in August of this year. The class focused on traditional field skills in southern Colorado, starting with pace & compass mapping, some Q geology mapping and measuring a stratigraphic section near Durango and ending with two substantial bedrock mapping projects around Molas Pass near Silverton.

The students are shown here in front of a textbook angular unconformity.

On the research front, Jon remains busy. He did field work in Taiwan in January with his long-time collaborator Tim Byrne and his graduate student Mike Chojnacki from UConn. They battled record cold and rising waters on a 5-day guided trek up the Dalun River. In July he returned to Taiwan with IUP students Lindsey Aman, Lauren Donati, Ross Bolesta, and the UConn team to conduct more fieldwork.



Pictured L-R are, Austin Patch, Jordan Kulak, Tyler Sherretts, Shane Parker (kneeling), Rock Brenner, Copeland Cromwell (on Rock's shoulders), Ian Darragh (in back), John Grozanick, Victoria Lewis, Sara Trio, Ross Bolesta, Kayla Kroczyński, Lindsey Aman, Ryann Knowles and Nicole Kelley.



Members of Team Tecto (Ross Bolesta, Lindsey Aman, Jon and Lauren Donati) perch on a boulder of pillow lava along the Hongyeh River in the eastern Central Range of Taiwan.

This December at the AGU meeting in DC, Lindsey will give a talk on our initial findings! Lauren and Ross will be there to ask hard questions and otherwise lend support. This year's AGU meeting will keep Jon and many other IUP folks busy; a large IUP contingent will be attending/presenting. Be sure to let us know if you will be there.

The NSF-Funded STEMSEAS project (<http://mlp.ideo.columbia.edu/stemseas/>) is also keeping Jon busy. During 2018 STEMSEAS sailed a total of 48 students from all over the U.S. (including IUP student Katie Jo Campbell!), on five ship transits. Katie Jo braved the Bering Sea in October and reported her experiences on Instagram ([kcampbell6996](https://www.instagram.com/kcampbell6996)) and shared what she learned with a YouTube video (https://www.youtube.com/watch?v=9v_uLBahw8E). She also posted to the STEMSEAS Wordpress blog. Jon hopes you will check out all the STEMSEAS activities online.

At the AGU meeting in December Jon and his Columbia University co-PI (and Pittsburgh neighbor!) Sharon Cooper will give an update on the impact that the STEMSEAS project is having on

Faculty News — Jon Lewis

its participants. They recently published a piece in *Oceanography* describing how STEMSEAS came to be and what they hope to accomplish with the project (<https://doi.org/10.5670/oceanog.2017.405>).

In the realm of service, Jon started a three-year term on the International Ocean Discovery Program (IODP) Science Evaluation Panel (SEP) this year. This Summer the SEP met in Potsdam Germany to evaluate an incredible array of proposals to drill through the seafloor. Jon next meets with the SEP in January at Scripps Institute of Oceanography.



In the meantime, Jon and Sharon Cooper continue to plot innovative ways to make the most of U.S. oceangoing assets in the name of education and outreach. He'll keep GeoTidings updated with news of any new developments.

Jon is very happy to report that Team Tecto graduates are continuing to do great things. Here is just a sampling of their accomplishments:

- Cate Bressers is continuing her seismology studies at Penn State and will be headed to Shell Oil down in Louisiana in the coming months for a fulltime position. Congrats Cate!
- Allie Berry has recently moved to Syracuse to work with Environmental Products and Services of Vermont. Congrats Allie!
- Our most recent graduate, Amy Clegg is

working at Skelly and Loy, Inc. in Pittsburgh and enjoying putting her geology training to practical use. She's been busy training (HAZWOPER etc.) and conducting Phase I and Phase II studies in the region and beyond.

- Other grads continue to thrive in the realm of environmental consulting. Last we heard, Matthew Magill was working with AMEC Foster Wheeler in New Mexico and Anthony Ledonne was working (and still mountain biking!) closer to home, in the 'burgh.
- Mark Smith is continuing to grow his imaging company, Macroscopic Solutions, up in scenic Connecticut (<https://macroscopicolutions.com/>), and he too continues riding his bike.
- Dan O'Hara is a PhD candidate at the University of Oregon and was recently back to IUP to give a talk on applied mathematics as a S-COAM scholar.
- His bride, Team Tecto alumna Ellen Lamont, is working on her PhD at Oregon State and currently on a Fulbright Fellowship in India!
- Mike Jarvis is also thriving, up in Cranberry at Range Resources. He and fellow grad Mallory Zelawski were recently at IUP to run a workshop on GeoGraphix. Thanks Mike and Mallory!
- Tom Paronish who graduated some years back is working at NETL after having finished his MS at WVU.
- Going a bit further back in time, Kalin McDannell is now a postdoc in Calgary and entertaining the notion of an academic career.
- From that same timeframe, Aaron Bowser is working as a petroleum geologist in Dallas and recently got married. Congrats Aaron!

Some Team Tecto grads are not included here because Jon's lost track of them. If that includes you, or someone you know, by all means reach out to Jon with updates!

Faculty News — Ken Coles

After some years away from the largest of all geophysics meetings, Ken gave a poster presentation at the AGU conference in New Orleans, December 2017. Lots of planetary scientists are interested, it turns out, in ideas for teaching sky motion and related phenomena. These are part of the sky but not always part of student understanding when they arrive at IUP. While many AGU regulars are (justly) hooked on San Francisco as a venue, New Orleans did not disappoint. We hope to see some of you in Washington, D.C. this year.

Seeing the small seismometers based on the tiny Raspberry Pi computer at the 2017 AGU meeting, Ken mentioned it to Jon Lewis. Jon suggested they apply together for an ACPAC grant to purchase two of the three-component units. They were successful, and the seismometers are now being configured for use in teaching, though they also have potential uses for student research projects.



training science teachers in Pennsylvania merits rethinking on a statewide level as other professions beckon and new ideas are needed to keep teaching a rewarding and appealing career choice for scientists.

Ken and wife Priscilla took an (almost) entirely recreational trip to Scotland, England, and Wales in May and June. While the other goals and itinerary did not allow as many geological stops as Prof. Cercone made (see her article), they did get to Fingal's cave also. The Highland Boundary Fault that runs just north of Balmaha along the east shore of Loch Lomond juxtaposes conglomerates and serpentine. (Photo) This corresponds geologically to the Dover fault in Newfoundland that some past IUP geology students have visited on a half dozen trips over the decades. And the beautiful island of Iona (the sun came out just as they got there) was rewarding not only for the history and ancient buildings (the Book of Kells is said to have been

written there), but for a view of Lewisian (in other words, Canadian Shield) granitic gneisses. (Photo) These clearly document the origin of northwest Scotland on the Laurentian side of the proto-Atlantic that closed up during the Paleozoic orogenies and left behind those serpentines. Field trip, anyone?



Two student teachers are currently completing their training in the Geoscience Department, Nate Zlockie and Gabi Zuccolotto. The Earth and Space Science Education program, which had as many as 25 students just 15 years ago, is now much smaller, as are IUP's other science education programs. The future of recruiting and

Faculty News — Katie Farnsworth

Once again it feels as though the years fly by faster and faster. Rumor has it that is the way it works as you age! The spring semester was bookended by events involving high school students and science. The academic year started out with another great day of volunteering as a science judge for the National Ocean Sciences Bowl regional competition. This quiz bowl competition focused on ocean sciences is always a fun day. The end of the semester saw the INTEL International Science Fair returning to Pittsburgh. I was lucky enough to spend a few days at this amazing event judging the Earth and Environmental Sciences Section. Each time I have done this it increases my hope for the future, those kids are outstanding!

Over the spring semester and into the summer I was happy to host a visiting scientist from Lawrence University in Wisconsin. Dr. Deanna Donohue arrived in April and began working on planning an air quality study in the area. She has been working on particulate plumes from resource extraction activities in a variety of locations around the country. Over the summer, two of her students joined her, and conducted fieldwork using a heavily instrumented trailer around the county.

I have been extremely active in our local Indiana County Stormwater Education Partnership. This group brings local government, environment and conservation groups, academia, businesses and citizens together on a monthly basis to talk about what is happening with regards to stormwater and what we can encourage others to do to decrease flooding issues in our streams due to stormwater runoff. We have had rain barrel and rain garden workshops, given tours of current practices to visiting groups from Pittsburgh and provided outreach to many on this issue.

My participation is due to the ongoing work we have monitoring the local streams here in Indiana, PA. This involves monitoring water discharge, temperature and water quality in our 'urban' streams. Along with colleagues in the Biology Department, we received a grant to expand the connection between the Indiana area schools and IUP. We have been working with teachers and students on stream monitoring and building place-based curriculum to bring local data into the classroom.

I was honored this summer to receive the Evergreen Award from the Evergreen Conservancy for our ongoing work here in town and throughout Indiana County with regards to water quality and quantity issues. It was also an honor to present at our college Science Inspires lecture series about the stormwater work in the area. It was perfect timing, right after the remnants of TS Gordon came through the area. 2018 has been the wettest year in at least 75 years for our area, but lucky for our town we did not see the flooding like we did in 2017 (or the sun for that matter!).

The fall has been busy with working with our college committee and the architects on finalizing plans for the new science building. We will be sad to leave Walsh Hall next year but look forward to the new building in 2022! The stream monitoring work has continued through the fall. Many thanks to my students for all the hard work they put in making sure the equipment is functioning and collecting data. I participated with colleagues in a local outreach event entitled "2 Scientists Walk Into A Bar", where we took science outreach out to our local brew pub. Not a bad way to spend an evening, talking science in a nice relaxed atmosphere.



Dr. Katie Farnsworth and Dr. Ken Coles along with other IUP science professors (and a fossil colleague) shared their passion for science.

It was great to see many of you at our 50th Anniversary and at other events and talks throughout the year. Don't be a stranger! It may be harder to find us next year, but come for a visit!

Faculty News — Nick Deardorff

This morning, while my 5-year-old and I caught snowflakes on our tongues while waiting for his bus to take him to kindergarten, I was reflecting that this has been a pretty good year.

Over the summer I was granted tenure and promoted to Associate Professor, which has been a life goal for quite some time. Additionally, I received two grants from the National Science Foundation (NSF). The first was for a Scanning Electron Microscope (SEM) with some analytical equipment, such as Electron Dispersive

Pennsylvania and Appalachian geology to better prepare our students for their future careers. This will be a collaborative effort between IUP, Kutztown, Edinboro, West Chester, and California Universities, where students and faculty from each university will be involved. Eventually we hope to open it to all PASSHE geoscience programs. This is a huge endeavor, so we will be meeting to work on organization and logistics for the program this January in Pittsburgh, before fine-tuning the details. We hope to run this course for the first time during summer 2020.



This summer, I was able to have some fun by participating in our three-week summer field course to Colorado. For this trip Drs. Lewis, Hovan and I took 15 students to southwest Colorado and hiked around the San Juan Mountains. We spent a week around Durango, and then two weeks near Silverton and Molas Lake. This area is truly spectacular with phenomenal geology. Taking students to incredible places like this is why I became a geology professor.

Spectroscopy (EDS) and Electron Backscatter Diffraction (EBSD). This was a large collaborative effort and the fourth submission for this instrument suite. Needless to say, we are VERY excited about receiving this \$425,829 grant and, rather than stressing about getting the money, I am now stressing about where to put it until our new science building is completed. I consider this a good kind of stress...mostly. This top-of-the-line instrument suite will greatly improve the analytical capabilities on campus and will be used by researchers from numerous disciplines.

The second NSF grant is for a workshop to design a new 6-week geology summer field course that will be held in the region and focus largely on

Although many of the hikes were quite rigorous (our base camp was at 10,500ft at Molas Lake), the students were very enthusiastic and engaged in the course for the duration. They took each challenge in stride, as IUP students do, and persevered no matter what we threw at them. I was very impressed with our student's ability to focus on the geologic problems at hand and also enjoy the splendor of one of the prettiest terrains I have ever encountered. Everyone (including the faculty) learned some new things, about geology and perhaps themselves, and truly enjoyed this experience.

I am now in my sixth year at IUP and each year keeps getting better...and a whole lot busier somehow..

Faculty News — Greg Mount

It's been a busy fifth year. My 2018 lab alumni (Santoro and Kelley) are off doing great things as graduate students. They still participate in lab activities and will have a great presence at AGU. At AGU, the lab will participate in nine abstracts with a large number of collaborators with topics that cover geoscience education, near surface geophysics, critical zone geophysics including seismic, resistivity and ground penetrating radar (see list at right). I am also a convener for a critical zone observatory geophysics session. Come see us!



Summer 2018 saw the first iteration of NSF-funded project *GPEXtra: A Geoscience Pathway Field Experience in Near Surface Geophysics to Promote Recruitment and Retention of Transitional Students in Quantitative Geosciences* (July 2017-2020). Along with collaborators from Rutgers, Temple and Penn State, we hosted 23 students from backgrounds that are underrepresented in the geosciences and brought them to the field to learn about near surface geophysics. Application and selection of this year's cohort is happening as I type, we expect to have about 24 participants this year. You can follow our fieldwork and research on Instagram—look for [@drjmount](#).

2018 AGU MEETING

Cambiero, J.,² McDonald, Y.,² O'Neil, P.,² Pope, G.,² Keating, K., **Mount, G.J.**, Nyquist, J., Brantley, S.L., (2018), Imaging the critical zone structure using seismic refraction in Garner Run at the Susquehanna Shale Hills Critical Zone Observatory.

McDonald, Y.,² Cambiero, J.,² O'Neil, P.,² Pope, G.,² Keating, K., **Mount, G.J.**, Nyquist, J., Brantley, S.L., (2018), Characterizing the subsurface of the Critical Zone in the Garner Run Catchment at the Susquehanna Shale Hills Critical Zone Observatory using Electrical Resistivity.

Keating, K., **Mount, G.J.**, Nyquist, J., Hayes, J.L., Gates, A.E., Brantley, S.L., O'Connell, K., Iverson, E. (2018), Using a near-surface geophysics and critical zone science field experience to broaden the participation of underrepresented minorities in the geosciences.

Mount, G.J., Hayes, J., Del Vecchio, J.M.,² Silverhart, P.,² Wayman, C.,² Brantley, S.L. (2018), Near-surface Geophysical Characterization of Cole Farms in the Susquehanna Shale Hills Critical Zone Observatory, Pennsylvania, USA.

Hayes, J., **Mount, G.J.**, (2018), Teaching near-surface geophysics in the critical zone: examples from a field-based multi-method jigsaw.

Accardo, N.J., Nyblade, A., Gu, X., **Mount, G.J.**, Brantley, S.L. (2018), Chemical vs physical influences on weathering at the Susquehanna Shale Hills Critical Zone: Preliminary Results from a 3D seismic imaging experiment,

Rasul, H.,² Hayes, J., **Mount, G.J.** A Hydrogeophysical Characterization of Karst Hydrology at the Dickinson College Farm.

Sirianni, M.,² **Mount, G.J.**, Comas, X. Using capacitively coupled resistivity and ground penetrating radar to investigate limestone bedrock heterogeneities under different subtropical wetland communities in Big Cypress National Preserve, Florida.

Kelley, N.,* Santoro, N.,* **Mount, G.J.**, Herndon, E., Singer, D. Contaminant source characterization in the Huff Run watershed: Resistivity imaging of a contaminant flow path in a passive acid mine drainage treatment system.

Faculty News — Jonathan Warnock

In the past year I've finally gotten to the point where I can say I've taught all of my geology major classes at least once. I look forward to refining and developing them as I move forward. However, some classes have been quite successful the first time around. In Paleontology, I took two weeks in the middle of the semester to present students with a critical thinking exercise. The students spent all of their lecture and lab class time (and plenty of time outside of class) analyzing an artificial bonebed. Students were expected to map each of the more than 200 bones, as well as describe any alterations (like rot and scavenging) to the bones. In the end, each group of students had to determine which facies were represented in the bonebed, what processes emplaced the bones, and what the minimum number of individuals represented was. The students were very enthusiastic about the exercise! I look forward to running it again and coming up with other innovative teaching exercises to engage students' minds.



Things progress well on the research front as well. I was accepted to sail with the International Ocean Discovery Program this Spring! I will be at sea for 60 days, collecting sediment cores from off the southern tip of

South America and off the coast of the Antarctic Peninsula. As a micropaleontologist, I will be providing age estimates to the cores while at sea. Once back home with samples in hand, I will be reconstructing sea surface conditions such as salinity, temperature, sea ice extent, iceberg flux and nutrient content. The goal of the mission is to understand the history of the Antarctic Peninsula since the Early Miocene.



This summer saw another successful field season at the Cleveland-Lloyd Dinosaur Quarry, with five IUP students, including a recent grad, participating. This year we focused on stratigraphy and paleo-environmental mapping. In addition, students got experience jacketing bones for removal from the quarry. Joseph Peterson, my colleague at the University of Wisconsin Oshkosh, and I are in the process of writing a grant and collaborative agreement with the Bureau of Land Management to continue to provide these opportunities to our students in the future. However, there is very little money in vertebrate paleontology research, so as always, we accept volunteers! Come spend a few weeks digging in the desert.

Faculty News — Yvonne Branan

The past year has been full of a couple of fun activities for me. In January, I was able to volunteer at the National Ocean Sciences Bowl in Pittsburgh. My teenage daughter volunteered as well, and it was great to see how impressive the students were!

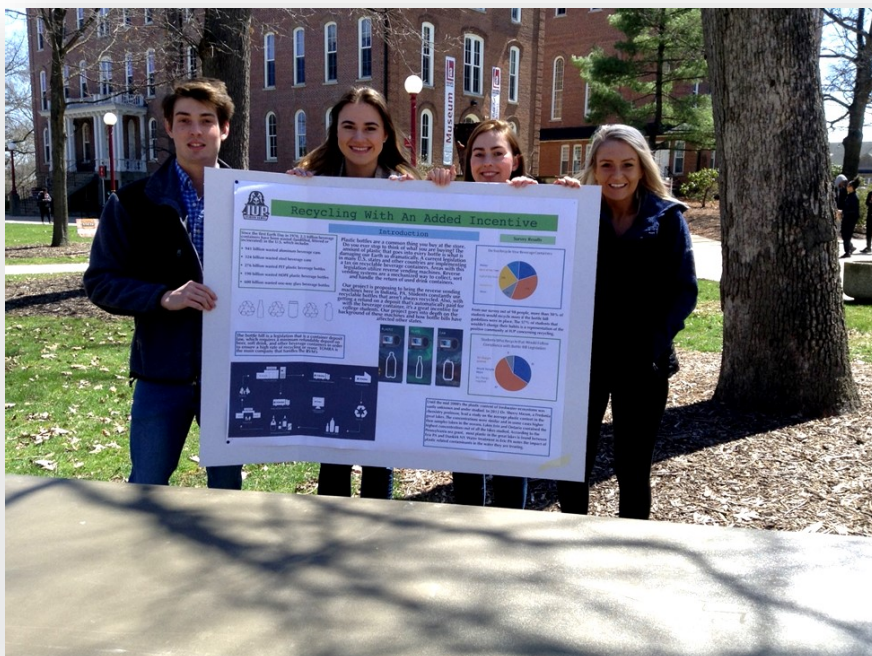
We also had the chance to celebrate the department's 50th anniversary recently. It was so good to be able to see so many alumni make it back to IUP for this – thank you to all who took the time to make that happen!

The most interesting and enjoyable thing I was able to do this year was to teach Introduction to Sustainability to a very diverse class. This included all undergraduate class levels from a variety of majors (Biology, Geology, Interior Design, Accounting, Geography, Fashion Merchandising, Sociology, and Psychology). The students were so engaged in learning how to make the world a better place! They formed cross-disciplinary work groups based upon a sustainability related topic and planned local action projects that had the potential to positively impact the health of our campus.

Student research groups examined topics, such as “Could we have container deposits and reverse vending machines on campus?”, “What is the state of waste awareness on campus?”, and “What are the benefits and costs of rooftop gardens? “, “Could clothing drives be a sustainable approach to fast-fashion?” and “Can college students afford to

eat sustainably?” Several of these groups even went through the rigorous process of becoming ‘Human subjects research training’ certified with me, in order to complete their studies.

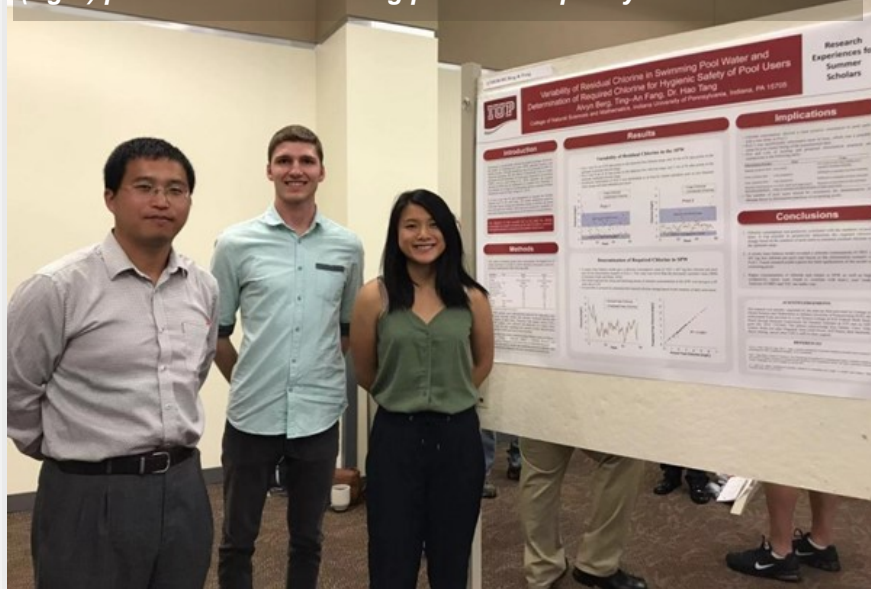
After researching their projects, both through scholarly research and networking with local experts, they shared their findings with the entire campus at the annual Earth Day celebrations in April. These included poster presentations and a clothing swap in the Oak Grove and a Recycling and Composting 101 educational outreach session.



We also had multiple speakers come to our classroom and took several local field trips: a small sustainable farm, Tanoma Wetlands educational park, and a Montauk Energy facility where they are processing landfill methane gas for pipeline readiness. I certainly hope to get the opportunity to teach a course like this again in the future!

ENVE Faculty News — Hao Tang

Dr. Tang (left)'s students Alwyn Berg (middle) and Ting-An Fang (right) present their swimming pool water quality research.



and water-health nexus to my lab.

My efforts this year were put into the applications of sustainable physicochemical processes to address challenging water environment issues. This was done through continuous writing of research proposals for external grants to support the prospective students, and mentoring the young researchers under the already funded USGS project, the RESS project, and the NSF teamwork project.

Thanks to the undergraduates and master's students who worked hard in my water quality and treatment laboratory, my group has generated fruitful outcomes. As I'm writing this note, 9 out of 11 papers we submitted this year have been accepted by well respected journals including *Environmental Science & Technology Letters*, *Water Research*, *Science of the Total Environment*, and so on (A detailed annual publication list of my lab is available online at <http://iblog.iup.edu/htang>).

We've made steady progress in the small fields of shale gas produced water treatment, acid mine drainage treatment, and swimming pool water treatment. I'm glad to see that the new environmental engineering program continuously attracts good students with strong interests that lie in the areas of environmental aquatic chemistry, water quality, sustainable water treatment technologies, and the water-energy

To date, there have been 5 IUP students in my lab who have published in peer-reviewed journals, and 3 of them have published twice. In addition, 3 of them have published as the first author. Looking into the next year, I am striving to make publishing at the current pace a normal scholarly activity in my lab, and to continue establishing the lab identity by publishing.

Alwyn Berg (left) and Ting-An Fang (right) worked in Dr. Tang' Water Quality Laboratory during the summer of 2018. The two undergraduates were the first- and second- authors of the most recent two journal publications of Dr. Tang's research group.



Emeritus Faculty News — John Taylor '75

Aside from a splendid birding trip to Florida with his brother Wil Taylor ('82) and their nephew Scott Simms in late April and early May, John remained firmly rooted at home over the last year, working diligently on fossil collections from Alaska, the Yukon, and Nevada. Faunas from carbonates interstratified with the Whale Mountain Volcanics on the Alaskan North Slope held center stage through the first few months of 2018. The final paper (Johnson et al., 2018), in which the faunas provide some of the most compelling evidence that those volcanics were not extruded on the Laurentian carbonate platform, but instead constitute an accreted fragment of Iapetus Ocean floor (the Whale Mountain Allochthon), will come out later this year in GSA Special Paper 451, a compilation of papers on Circum-Arctic Structural Events.

John's focus shifted later in the year to collections made with James Loch ('83) from the Windfall Formation in Nevada a decade ago. The impetus for resurrecting that project was a controversy raging in the international geological community over the suitability of the agnostoid arthropod *Lotagnostus americanus* for defining the base of the highest of ten global stages into which the Cambrian System is being divided. The information extracted from large collections of well-preserved specimens of *Lotagnostus* recovered from deep marine, siliceous coquinas in the Antelope Range in 2008, along with conodonts extracted from the same rocks by John Repetski ('69) at the USGS, dealt (what should be) a crippling blow to the candidacy of *L. americanus* for defining the base of Stage 10. The data presented on the Windfall material in posters at an international conference in Xi'an, China in August and at GSA in Indianapolis in November, refute the claim

that *L. americanus* was a single, highly variable and almost globally distributed species in the late Cambrian.

Most recently, John has enjoyed processing some spectacularly well-preserved trilobites collected from deep marine limestone conglomerates near Nadaleen Mountain in the western Yukon, Cambrian deposits similar to the famous boulder beds in the allochthons of Quebec and Newfoundland. Although work on these collections has just begun, it is already clear that the faunas there include plenty of new species that need to be described (e.g. the new species of *Loganopeltoides* whose cranidium and pygidium are shown here), and hold valuable information on the age of those deposits and their relationship to the extensive volcanics in the vicinity.



Emeritus Faculty News — John Taylor '75

The Nadaleen Mountain faunas are significant for several other reasons. First, they are the first collections that John has processed not at IUP, but at the “Taylor Institute” on Warren Road near the Indiana Mall. (That’s 2160 Warren road, for any alumni who might want to stop by for a visit and a tour of the facilities.). He and number-one-son Adam spent a considerable amount of time this fall emptying his research lab to pass it along to Jonathan Warnock, who waited patiently for nearly three years for the old guy to move all those rock-filled cabinets out of 133 Weyandt.

Secondly, the nice material suggests he finally has gotten through to his colleague Justin Strauss at Dartmouth that he prefers fossils that have NOT been contorted like pretzels and are encased in matrix that does NOT adhere to the fossils as tightly as high-grade epoxy! Perhaps Tyler Allen ('15), who has been working in Justin’s lab and assisting him in the field in recent

years, had a hand in convincing him to land the helicopter on rocks that don’t look like they were stirred with a stick. Regardless of the cause, John is delighted to have really nice material to work on at home where he has spent most of his time since Joanne’s knee replacement surgery in late October. After a rocky (no pun intended) start, her recovery has been proceeding well, but it will be a while before she can relieve John of the lion’s share of Kait-duty, laundry (in the basement), etc.

The next monumental chore on the John’s IUP agenda is emptying his office by the start of the spring 2019 semester, a move necessitated by the relocation of Geoscience Department and faculty offices in advance of the demolition of Walsh Hall next summer. Fossil collections and a gazzillion papers and books to be transported home to the Institute. Hmmm, wonder what Tom Moore is doing next month.

Emeritus Faculty News — Joe Clark



Great to attend the 50th Anniversary Banquet and to see so many former students, including some from the Pleistocene (aka the seventies).

Watching progress on our new Science Building, but so far only an empty lot with excess siltation. Where is Katie Farnsworth when we need her? But not looking forward to the big move(s) in a year or two.

Limited geologizing with my older daughter’s rehab from a ruptured brain aneurysm more than one year ago, but pleased with her improved progress of late. Thus a chance to catch up on some much neglected California geology, including an opportunity to clarify some Tertiary age discrepancies with USGS colleagues. Unfortunately, my two primary California coworkers have passed on and another is working mainly from home as the California USGS is contemplating a move from Menlo Park to the Ames facility in Mountain View.

Best to All,

Joe Clark

IUP's 2018 Summer Field Workshop: Geology of the American Southwest

This past summer, 15 intrepid geoscience majors set off with three faculty mentors (Drs. Jon Lewis, Steve Hovan, and Nick Deardorff) on a three week field workshop in the mountains of Colorado. Some alumni might remember GEOS 405 as a grand tour through the national parks and monuments of the Colorado Plateau, but it has evolved over the years into a field-mapping course that gives students the skills they need to collect and analyze geologic data.



Several of the mapping projects were carried out at high elevation, and many required long hikes from base camp to reach the area of interest. This meant that students had to rise to the challenge of being out of cell phone range for several days — but it was worth it to get photos like these!

The Geoscience Department uses alumni donations to the IUP Foundation each year to make sure that students from all socio-economic backgrounds can afford the costs of these long field workshop. We want to make sure that no one has to forego learning about geology in the best possible classroom — outside!

We thank all of our loyal alumni for their donations through the years that have allowed us to mentor and prepare the next generation of geoscientists for their work.



Please Stay in Touch!

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If you use the website link above, click on the gray box to view other IUP funds. Scroll to the end and then choose 'other'. You will be asked to fill in one of the specific account numbers below.

The Geoscience General Fund (224530)

The Joseph C. Clark Research Scholarship (630545)

The Walter Granata Memorial Fund (224784)

The Paul Prince Memorial Fund (224783)

The Next Generation Field Geology Fund (224789)



Thanks from All of Us!