I am sorry to bring you sad news but Xiaobing Zhou’s wife Yan Fang passed away March 28, 2016, after a long battle with cancer. Yan was a bright and happy spirit and everyone who knew her was the better for it. Please keep Xiaobing and his family in your thoughts. Brad Rutherford taught Xiaobing’s course load this spring so that Xiaobing could attend to his wife.

The Geophysical Engineering Department requested and was awarded $23,465 in one-time-only funds to for electronics equipment for our electronics laboratory. In the past, we shared an electronics laboratory with the Electrical Engineering Department but now we maintain and run our own laboratory that we use to support our electronics course: PHSX 322.

In addition, the Department received $15,431 from Montana Tech capital equipment finds for a hyperspectral imagining system. This system will be used to support Xiaobing’s remote sensing courses and research.

Newmont Mining Corporative provided $12,000 to help us to continue to expand our Digital Acoustic Sensing (DAS) Laboratory. Kal Miah is working to bring this laboratory to national prominence.

On Friday, October 7, 2016, we will have our annual Industrial Advisory Board (IAB) meeting in Butte, Montana, to coincide with Homecoming weekend. The IAB provides industry input to our program and this is an important part of our assessment process. Please feel free to contact me if you are interested in serving on the IAB. As a related matter, we have our every-six-years accreditation visit from ABET starting Sunday, October 9, and continuing through Tuesday, October 11. The IAB is an important component of the accreditation process and we take IAB input very seriously.

Montana Tech is in the middle of a major Capital Campaign to raise funds to support important campus goals including a number of endowed professorships. The Geophysical Engineering Department can grow and strengthen by recruiting an outstanding researcher and teacher to fill an endowed chair. If you would like to help us meet our fundraising goals and help support an endowed professorship, then please contact me and we can discuss how you might help.
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INDIVIDUAL GIFTS
Faculty News

John Getty:
This last year was busy preparing to teach some classes for the first time and finishing up the SNaP project.

I taught the venerable Physics 1 – Mechanics for the first time last Fall. I understand why Jim Girard gets so excited by this course. The room seemed to brighten throughout class each day as the material sank in and the student’s light bulbs lit up. I also taught for the first time Xiaobing’s Electronics for Scientists course. I have taught similar courses for many years, but the non-electrical engineering students enrolled in this course made for a unique and interesting experience.

The three-year Survey of Native Proppant project closed at the end of 2015 and we presented the results to the Montana Board of Oil and Gas Conservation in February. We are looking to get the report published through the Montana Bureau of Mines and Geology open file program sometime before the end of the year. Two of the students that worked on the project, Alicia Kastelitz and Rachael Wilford had a poster on the project accepted for presentation at the prestigious Posters on the Hill event for our Washington representatives. Beverly Hartline graciously covered for me so I could focus on preparing for finals. This is the first time Montana Tech has been represented at this annual Council on Undergraduate Research event.

I have been asked to serve as chair of the ASTM section D18.26.03 on Materials for Hydraulic Fracturing. In addition, I will be teaching Physics II – Heat, Sound and Optics for the first time this next far semester. Looks to be another busy year!

Jim Girard: Jim continues to teach physics and manage the physics lab.

Curtis Link: Curtis Link retired from the Department in 2013. He is Professor Emeritus of Geophysical Engineering Department. After part of a year working for Geolex in Helena, he is back at Montana Tech as Director of the Freshman Engineering Program.
Marvin Speece: Graduate student Mason Porter finished processing and interpreting seismic data from the Flathead area, Montana, that were donated to us by alumnus Hugo Pulju. He defended in the fall, 2015, and his research appears in the journal Structural Geology. Brad Rutherford continues to work on his paper for the journal Tectonics that discusses the regional tectonics of northwestern Montana. Graduate student Meltsem Akam defended her thesis about the processing and interpreting a Vertical Seismic Profile (VSP) that was collected in 2007 as part of the ANtarctic geological DRILLing (ANDRILL) Program. Her results show that seismic anisotropy that she observed in the converted P to S data is likely due to regional fracture orientation in the southern Ross Sea.

I am working with Mary MacLaughlin from the Geological Engineering Department at Montana Tech on a National Institute for Occupational Safety and Health funded project to demonstrate the use of fiber optics for enhance mine safety. Fiber optic sensing technology has advanced to where ground motion can be monitored using fiber optic cable. We have installed fiber optic cable in an underground mine and soon will record seismic events with the cable and compare the results to convention seismometers.

Xiaobing Zhou: I continued to teach Gravity and Magnetic Exploration, Elements of Geophysics, Electricity and Magnetism, Field Geophysics, and Remote Sensing for both upper level undergraduates and graduates. I am funded by the state of Montana on a two-year project Enhancing Montana’s Energy Resources: Research in Support of the State of Montana Energy Policy Goals, in collaboration with researchers from both Montana Tech and Montana State University. My role in this project is two-fold: estimation of the area of the Coal-Bed Methane (CBM) water retention ponds in the Montana Powder River Basin from satellite remote sensing data and hyperspectral monitoring of algae. The objective is to investigate how to make use of the CBM water ponds by growing algae and simultaneous sequestration of CO2 to produce value-added products. In addition, a manuscript Bulk electrical conductivity response to soil and rock CO2 concentration during controlled CO2 release experiments: Observation and analytic modeling by graduate student Scott Jewell and others was published in Geophysics. I also began to collaborate with researchers in Nanjing University of China in applying remote sensing techniques to snow/ice and salinity monitoring. Two visiting scholars from China will join us soon to do research on remote sensing image segmentation/classification and the ionosphere effect on radar remote sensing.

Khalid Miah: I worked on diverse projects this summer. One of the projects involved quantifying nano-materials fiber alignment from SEM (Scanning Electronic Microscope) images. I am collaborating with other Montana Tech engineering/science faculty members as one of the co-PIs on this ARL (Army Research Laboratory) funded project. I am mentoring/supervising two graduate students (1 MS and 1 PhD) in the image processing aspects of this project. In addition, I am also mentoring one undergraduate student on his SURF (Summer Undergraduate Research Fellowship) project. This past fall/spring, I mentored another undergraduate student on his URP (Undergraduate Research Program) project. I was a reviewer for the 2016 SEG (Society of Exploration Geophysicists) Annual Meeting expanded abstracts, and the student grant proposals for the MAS (Montana Academy of Sciences). I was elected to serve on the board of MAS representing Montana Tech.
Mohamed Khalil: It was a great pleasure to work as a faculty member in the Geophysical Engineering Department last year. I enjoyed teaching resistivity, petro-physics, and physics for both graduates and undergraduates. I really enjoyed the challenge of teaching. For research, I presented a research paper at the Symposium of the Application of Geophysics to Engineering and Environmental Problems (SAGEEP) at Denver, Colorado. In addition, a project with the Montana Bureau of Mines and Geology has been started to study the hydro-tectonic regime around Lolo-Creek, Montana, by using resistivity methods.

Paige Payne: Paige was hired September 1, 2016 as the Administrative Associate I for the department. Her background includes construction, bookkeeping and office management.

Recent Publications

Recent publications:


Khalil, M. A., Santos, F. M., and Speece, M. A. 2016, A static shift correction for 2-D resistivity data through frequency domain electromagnetic data: Symposium on the Applications of Geophysics to Engineering and Environmental Problems, Abstract S8.

Recent Publications, continued


Recent MSc Theses:


Natalia Krzywosz, 2015, Investigation of Ambient Seismic Noise using Seismic Interferometry in Western Montana.

Mason Porter, 2015, Cordilleran Front Range Structural Features in Northwest Montana Interpreted from Vintage Seismic Reflection Data.

Meltem Akan, 2016, Processing and Interpretation of Three-Component Vertical Seismic Profile Data, Ross, Sea, Antarctica.

2016 Senior Design Project:

FIELD CAMP 2016