

## Note from the Morton K. Blaustein Chair

Welcome to the latest edition of the Earth & Planetary Sciences Newsletter. As I write, the first hints of spring are evident, a welcome relief from the hardest Maryland winter in many years. Earth & Planetary Sciences is undergoing a renaissance too. We anticipate the retirement of several senior faculty in 2014, and late last year, we learned of the passing of Dr. Lawrence Hardie. Lawrie, a distinguished authority on geochemistry and sedimentology, was a member of our department for half a century and was a mentor and friend to generations of us.

Simultaneously, new growth is in our midst. In Fall 2013 we welcomed several people to Earth & Planetary Sciences. Five new graduate students, Anna Scott, Hannah Susorney, Olga Tweedy, Xiaokang Wu, and Xu Yang, arrived to begin studying towards their PhDs. Two new postdoctoral fellows also arrived, supported by generous donations to our department. Dr. Maylis Landeau, the Blaustein Postdoctoral Scholar, is an expert on the fluid dynamics and evolution of planetary interiors and joins us from L'Institut de Physique du Globe in Paris. Dr. Rolando Saunders is the Glenadore and Howard L. Pim Postdoctoral Fellow. Rolando holds a PhD in Atmospheric Science from the University of Wisconsin, Milwaukee, and is studying the impact of global change on particulate matter and human health. Faculty news includes two noteworthy items: Prof. Ciaran Harman recently received a joint appointment in Earth & Planetary Sciences. Ciaran is an Assistant Professor in the Department of Geography & Environmental Engineering in the Whiting School, with world-class expertise in landscape hydrology. Profs. Naomi Levin and Ben Passey announced the arrival of their first child, Aaron Samuel Passey, in the New Year. Welcome and congratulations to you all!

Thanks, as always, to our donors. Your gifts make a tremendous difference. They inspire and catalyze our activities, especially at the uncharted boundaries between fields.

With best wishes for 2014,



Thomas W. N. Haine



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## Seminars & Lectures

### Bromery Seminar Series - 12:00 PM on Thursdays

Check our website for any changes <http://eps.jhu.edu>

- February 6–Lori Glaze
- February 13–Ralph Kahn (Cancelled due to weather) Look for reschedule date.
- February 20–Ciaran Harman
- February 27–Jonathan Petters
- March 6–Eric King
- March 13–Sean McMahon
- March 27–Carla Rosenfeld
- April 3–Adele Morrison
- April 10–Ralph Kahn
- April 17–Marcus Sarofim
- April 24 – Mary–Louise Timmermans
- May 1–Ryan Abernathey

## In Memory of Lawrence A. Hardie January 13, 1933 – December 17, 2013

Lawrence ("Lawrie") Alexander Hardie, Professor Emeritus of Geochemistry and Sedimentology, died on December 17, 2013, in Seaside, California, with his family at his side. He had suffered from Alzheimer's disease.

For nearly 50 years, Lawrie inspired students and colleagues at Johns Hopkins through his devotion to science, his personal integrity, and his commitment to the welfare of others.

Born in Durban, South Africa, Lawrie's formative years were affected by his family's tenuous financial conditions as well as the social and political upheavals in his home country. He attended University of Natal, where he was inspired to switch from chemistry to geology by the eminent geologist Lester King. In 1960, he began his Ph.D. in Geology at Johns Hopkins with Francis Pettijohn and Hans Eugster. He completed his Ph.D. in 1965 and joined the Hopkins faculty, rising to Full Professor by 1974. He served as Chair from 1992-1995 and in 2006. By his retirement in 2007, Lawrie had mentored more than 30 Hopkins Ph.D. students, many of them having since gone on to leadership positions in academia, industry, and government.



Lawrie Hardie, Summer 2004

Lawrie's comprehensive study of evaporites led to the hypothesis, since verified, that seawater has undergone long-term variations in its major ion composition. He demonstrated that these seawater variations are linked to plate tectonic processes at mid-ocean ridges. This work has revolutionized the study of calcifying marine organisms and their role in the global carbon cycle. He also made fundamental contributions to the understanding of dolomitization and cyclic deposition of carbonate. In recognition for his work, he was awarded the 2003 Francis J. Pettijohn Medal for Excellence in Sedimentology by the Society for Sedimentary Geology.



Lawrie with his first (Tom Tourek, 1970, left) and last (John Lucjaz, 2000, right) students.

Lawrie made invaluable contributions to the educational mission of the Department, allowing students to witness geologic processes firsthand, taking them to far-flung locations such as the Florida Keys, the Gulf of California, the Italian Dolomites, and the Atlantic Barrier Islands. He also taught geology in the evening college for many years.

Along with his wife Glenys Hardie and his two children, Debbie Buettner and Russell Hardie, Lawrie is survived by five grandchildren. A memorial service is planned for Spring, 2014 in Maryland. Friends and colleagues are encouraged to contact the Department for additional information.

## Thank You to Our Donors

We are indebted to the following alumnae, alumni, friends, and organizations for contributing to the Department from July 1 to December 31, 2013.

Robert W. Adams, Ph.D.

Dr. Steven E. Boyer

I-Ming Chou, Ph.D.

Dr. Edward H. M. Chown

Elaine Eugster, Ph.D.

Harindra J. S. Fernando, Ph.D.

Donald G. Hadley, Ph.D.

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Richard B. Palmer, Ph.D.

Pierre Sauve, Ph.D.

Mrs. Roberta Meares Spang

Mr. Edward J. Wall

Mr. John P. Witzenbocker IV

Dr. Lyndon A. Yose

Chen Zhu, Ph.D.

*Please accept our apologies if we missed your name on the above list. If you will let us know, we would be most grateful, and will make sure we acknowledge your gift in the next newsletter. Your gifts mean more to us than you may realize. We are a small department. We remember all of our alumni and we are grateful that, through your gifts, you still support and are interested in the Department and its scholarly activities. Some of the things your gifts allow us to do are: admit more graduate students, pay for student summer field and laboratory work, maintain Singewald Field Camp and purchase equipment, teaching and research materials and equipment that are not covered by the department's operating budget. Your generous gifts make a significant difference to the Department of Earth & Planetary Sciences and we thank you.*

## In The News

### Transient Water Vapor at Europa's South Pole



Darrell Strobel

The recent publication of water vapor plumes erupting from Jupiter's icy satellite Europa (Roth, L., J. Saur, K. D. Retherford, D. F. Strobel, P. D. Feldman, M. A. McGrath, and F. Nimmo, *Transient Water Vapor at Europa's South Pole*, *Scienceexpress*, 12 December 2013, *Science*, 343, 171-174, 2014) gave one of astrobiologists' favored locations for exploration of life in our solar system a big boost. It was part of a Hopkins program of research using the Hubble Space Telescope to remotely explore the Galilean satellites dating back to the discovery of an oxygen atmosphere around Europa in 1994. The Hopkins team includes Profs. Darrell Strobel (EPS), Paul Feldman (Phys. & Astro.), plus Dr. Melissa McGrath, formerly Space Telescope Science Institute, now chief scientist at NASA's Marshall Spacecraft Center. She is also an EPS and Physics and Astronomy Postdoctoral Fellow, who was elected to the Johns Hopkins University Society of Scholars in 2013.

The lead author Lorenz Roth, now at South West Research Institute, spent the Fall 2010 semester as an EPS visiting graduate student from the University of Cologne working with Profs. Feldman and Strobel on the reduction, analysis, and interpretation of Hubble Space Telescope data acquired from observations of the Galilean satellites. With his Hopkins training, he led the discovery of water vapor plumes on Europa. Dr. Kurt Retherford is also at SWRI and earned his Ph. D. in physics at Hopkins analyzing HST data on Io.

Prof. Joachim Saur, the second author and the Principal Investigator, spent the Fall 1995 semester, between his Diplom (Master's) and Ph. D., at the University of Cologne, working with Prof. Strobel modeling Jupiter's magnetospheric plasma interaction with Europa's atmosphere. Prof. Strobel was the 2nd reader of his Ph. D. Dissertation. Later Joachim Saur was an EPS Postdoctoral Fellow from 2001-2002 and a Senior Research Scientist, JHU/Applied Physics Laboratory 2003 – 2005, before returning to the University of Cologne as a full professor of geophysics in 2005.

To read more go to: <http://www.nature.com/news/hubble-spots-water-spurting-from-europa-1.14357>

### Intel Science Talent Search



Lucas Winch

Lucas Winch, a senior at Baltimore Polytechnic Institute and a Geoscience Ingenuity intern in the E&PS Open Earth Systems project, has been chosen as a semifinalist in the 2014 Intel Science Talent Search.

The title of Lucas' project is "Origins of Large Igneous Provinces." The goal of his work was to characterize the conditions in the mantle where large igneous provinces (LIPs) formed during the past 330 million years. Working with OES team members (Raj Goswami, Linda Hinnov, Evan Reynolds, and Peter Olson), Lucas reconstructed the position of dozens of ancient LIPs events, showing that they tend to form in between high and low temperature regions on the core-mantle boundary.

The Intel Science Talent Search is the most prestigious pre-college science competition in the U.S. One of 300 semifinalists, Lucas and Poly will each receive \$1000. Some 45 finalists will be selected later in 2014. To read more go to: Baltimore Fishbowl: <http://www.baltimorefishbowl.com/stories/two-baltimore-students-named-semifinalists-in-intel-science-talent-search/>

Intel Science Talent Search: <https://student.societyforscience.org/intel-sts-2014-semifinalists>

### Grant Title: In Hot Water and Harm's Way: Modeling to Promote Regional Resilience to Repeated Heat Waves and Hurricanes



Ben Zaitchik

Communities are interested in becoming more resilient to weather extremes but often lack the tools and resources to fully understand the problems and make good decisions. This lack of understanding is understandable given the complex and interrelated nature of the impacts from extreme events. Communities need to design solutions for infrastructure management, land use planning, public health, and emergency management, understanding how each is related to the other. The problem is exacerbated in regions subject to repeated extreme events.

A new NSF-funded project that includes multiple JHU departments along with co-investigators from Georgetown University, George Mason University, and Resources For the Future, will develop an integrated model of the impacts that repeated hurricanes and heat waves have on vulnerability across the mid-Atlantic United States. Assistant Professor Ben Zaitchik, a co-investigator on the project, will be working with his students to develop heat wave mapping and prediction systems and hurricane wind strength estimates to support the integrated modeling effort. Ultimately, this project aims to improve our understanding of physical, structural, and social aspects of hazard response, and to inform resilience strategies that will help to prevent repeated hazards from becoming repeated disasters.

To read more go to: <http://hub.jhu.edu/2013/10/28/guikema-modeling-grant-nsf>

## In The News Continued

### Veblenite



David Veblen

$K_2\text{Na}(\text{Fe}_5^{2+} \text{Fe}_4^{3+} \text{Mn}_7^{2+\square})\text{Nb}_3\text{Ti}(\text{Si}_2\text{O}_7)_2(\text{Si}_8\text{O}_{22})_2\text{O}_6(\text{OH})_{10}(\text{H}_2\text{O})_3$  is the recently-named mineral Veblenite (Cámara et al., *Mineralogical Magazine*, **77**(7), 2955-2974, 2013). Veblenite is found in Newfoundland and Labrador and acknowledges the accomplishments of a distinguished Professor in Earth & Planetary Sciences. Quoting from the paper: "The name is in honor of David R. Veblen in recognition of his outstanding contributions to the fields of mineralogy and crystallography. He has established himself as one of the foremost experts in the use of transmission electron microscopy in geology and has made significant contributions to the polysomatic approach in mineralogy. The new mineral species and its name have been approved by the Commission on New Minerals, Nomenclature and Classification of the International Mineralogical Association. The holotype specimen of veblenite is at the Royal Ontario Museum in Toronto Canada."

### Studying archaeological histories form space



Michael Harrower &amp; Ben Zaitchik

Ben Zaitchik and Michael Harrower had the following article posted in the winter edition of the Johns Hopkins Magazine and reposted on the Hub in mid-December.

Michael Harrower and Ben Zaitchik of the Krieger School use satellites to study archaeological histories. Here, a Worldview-2 satellite image of an oasis near Yanqul, Oman, has been laid over a topographic image from Japan's Advanced Land Observing Satellite. In this image, various wavelengths of light are selected to highlight things not visible to the naked eye—the type and health of modern vegetation, shown in shades of orange, and variability of ground surface texture and composition, shown in shades of blue, green, and gray. These details of the modern landscape inform hypotheses and models on the locations and productivity of irrigated agriculture in the ancient past. To read more go to: <http://hub.jhu.edu/magazine/2013/winter/archaeology-from-space-satellites>  
Written by Dale Keiger.

### Fullbright Visitor



Dr. Nitish Dogra

Dr. Nitish Dogra, a Fulbright-Nehru Environmental Leadership Program Fellow from India and an MPH alumnus from the Bloomberg School of Public Health began his affiliation with the Department on September 17, 2013 for a period of four months. During his time here his work involved advanced modeling relating climate and health data. Dr. Dogra is currently based out of New Delhi where he is employed with IHMR, a Hopkins collaborating institution, as an Assistant Professor and Convenor for the Centre for Climate Change and Environmental Health.

## Welcome in 2013

### Graduate Students



Anna Scott



Hannah Susorney



Olga Tweedy



Xiaokang Wu

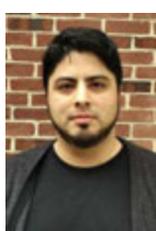


Xu Yang

### Postdoctoral Fellows



Maylis Landeau



Rolando Saunders

## Sedimentary Geology Trip

Naomi Levin's Sedimentary Geology class took two field trips to Western Maryland during the fall semester. Mackenzie Fisher (E&PS senior) is showing off her skills with a Brunton compass and Kirby Runyon (E&PS graduate student) is pointing to a Devonian tree root.



Mackenzie Fisher



Kirby Runyon

## Graduate Student Outings

Members of the E&PS Department embarked on two adventurous hikes during the Fall semester. The first hike was to Mineral Hill, where mining for iron ore and eventually copper ores began shortly before the Revolutionary War. Mineral Hill is located within the Liberty Complex that was metamorphosed during the Taconic Orogeny when the arc was sutured to the continent. This process allowed for iron and copper ore rich minerals to be brought from depths where they can now be collected at the surface due to mining processes. A group of E&PS graduate students and Post docs headed out to collect minerals. The second hike was to Gunpowder State Falls along the Lost Pond trail. We discovered "Potrocks" along the river edge where the water eroded "potholes" into the folded metamorphic rocks and the pond was really lost. A Halloween BBQ was held for the Department, where everyone enjoyed good food, and great company.



Mineral Hill



Gunpowder Falls State Park



## Welcome Back

Before getting too involved in our everyday studies and research, the Department gathered for our annual Welcome Back Event on September 13, 2013 at the Hard Rock Café in Baltimore's Inner Harbor.



## Blaustein Postdoctoral Scholar Positions in Planetary Sciences

Applications are invited for the Morton K. Blaustein Postdoctoral Scholar in the Department of Earth & Planetary Sciences. For more information go to: [http://eps.jhu.edu/Blaustein\\_Ad\\_2014.pdf](http://eps.jhu.edu/Blaustein_Ad_2014.pdf)

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## Alumni Corner

**Attention all Alumni-** We would love to hear from you and share your news in our next edition. Please contact Kim Trent @ [ktrent2@jhu.edu](mailto:ktrent2@jhu.edu). We look forward to hearing from you.

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