2012

# GSA Medals & Awards

Presented at the

*124th Annual Meeting*

of the

*Geological Society of America*

*5 November 2012*
*Charlotte, North Carolina, USA*

# PENROSE MEDAL

**Presented to**
**Raymond A. Price**

Raymond A. Price
*Queen's University (Professor Emeritus)*

### *Citation by Tekla A. Harms*

Just as it was my honor and great good fortune to have been his student, it is my honor to cite Raymond Price for the 2012 Penrose Medal from the Geological Society of America.

Born in Winnipeg, in the flattest part of Canada's prairies, Raymond Price went on to give geology an unparalleled understanding of a terrain so rugged it ultimately cost him three knee and two hip replacements. As an undergraduate at the University of Manitoba, Ray made two choices that have consequently reshaped our knowledge of orogenic belts; he elected to take a geology course to compliment his studies in physics and chemistry and he started his life-long collaboration with another Manitoba geology student, who we know as Mina Price. Graduating with honors in geology, Ray went to Princeton, where he completed a PhD in three years. For the next decade, he mapped the Canadian Rocky Mountain thrust belt as a research scientist with the Geological Survey of Canada and as the director of their Operation Bow-Athabasca. Over the years, he has published maps covering an area of some 20,000 square kilometers, or roughly the area of the Swiss, French, and Italian Alps combined. This, alone, is a staggering accomplishment. Moving from the GSC to the Department of Geological Sciences at Queen's University in Kingston, Ontario, and with his posse of 31 graduate students over 24 years, Ray continued to investigate the structure of the southern Canadian Cordillera. The Geological Survey of Canada called Ray back into service in 1981 first as Director General and next as Assistant Deputy Minister for the Earth Sciences Sector. (That his departure from Queen's immediately followed my arrival as a graduate student I choose not to take personally!) While holding these posts, Ray also served on virtually every commission and council of note associated with the earth and environment in North America, too numerous to report here but ranging from establishing the International Lithosphere Program, to Chairman of the Board of Trustees of the Sudbury Neutrino Institute, to President of our own Geological Society of America. Ray returned to Queen's a decade later and resumed his teaching and research career. His transition to Professor Emeritus over a decade ago has not curtailed his publishing, research, supervision of graduate students, or service to the Earth Science community - work that goes on to this day.

The foundation of Ray's research lies in his detailed understanding of the geometry of the Canadian Cordilleran thrust belt in space and time, developed from his extensive mapping. Ray has drawn balanced cross-sections and palinspastic reconstructions that demonstrate the three-dimensional character of the thrust belt with unparalleled precision. This has made the Canadian Cordilleran thrust belt an archetype among the world's orogens. Ray has gone on to build a comprehensive understanding of the kinematics, mechanics, and dynamics of thrust belts, in general. He is responsible for demonstrating the role of tectonic wedging over a broad range of scales, and addressed the mechanical paradox of thrust fault displacement with a dislocation model of fault propagation. Ray explored the role of gravitational body forces in thrust wedge propagation, and documented the interplay between original continental margin stratigraphy and subsequent thrust geometry.

With a breadth of vision equaled by few, Ray has been able to integrate the geology of the thrust belt with the evolution of the Canadian Cordillera as a whole, in all its complexity. Ray has documented the co-evolution of the thrust belt and its foreland basin, linking isostatic subsidence and pulses of clastic influx to thrust fault advances. He recognized the relationship of the amalgamation of outboard terranes to the collapse, thickening, metamorphism, and cratonward translation of the ancient continental margin along a basal decollement that rooted under the detached hinterland. Ray saw the role of extension in the final stages of Cordilleran development and identified the presence of metamorphic core complexes in western Canada. He demonstrated a link between major dextral strike-slip faults and core complex extension, synthesizing both with relative plate motion vectors in a single, evolving, regional strain ellipse.

The importance of Ray's body of work toward a general model of orogeny cannot be overestimated. It is reflected in the recognition that Ray has gained internationally. He has received distinguished awards from the Geological Societies of England and Germany, and from the French Government. He is a Fellow of the American Association for the Advancement of Science and a Foreign Associate of the US National Academy of Sciences. In his home country, Ray holds the Logan Medal of the Geological Association of Canada, the Douglas Medal of the Canadian Society of Petroleum Geologists, is a Fellow of the Royal Society of Canada, and an Officer of the Order of Canada, the highest civilian honor given.

Ray has a zeal for knowledge and deep sense of responsibility toward the future; he has the highest scientific ethic, a gentle and constructive candor, and unwavering generosity in the promotion of young scientists.

I know you will all join me in congratulating Ray Price on becoming the 2012 Penrose Medalist.

### *Response by Raymond A. Price*

This is a unique, unexpected honor: unique because of my esteem for previous Penrose medalists and because GSA has been my principal professional association for 56 years, unexpected because I know many people worthy of the Medal who have not yet received it.

I am deeply grateful to Tekla Harms and other colleagues for my nomination; and to my wife, Mina, for 56 years of encouragement and support, in the field and the lab, as well as at home. I am also grateful for my good fortune over the past 60 years, including exceptional mentors, scientific colleagues, and graduate students; and the outstanding research opportunities available to me during my association with the Geological Survey of Canada (GSC) and Queen's University.

In 1952, after one geology course, I was hired by the GSC for Geoff Leech's mapping team in the Purcell Mountains of SE British Columbia. Geoff, an extraordinary mentor and role model, so nurtured my fascination

with the mountains and my interest in geology that I switched from physics and chemistry to geology. With his help, I also obtained GSC field experience in the western Rockies, Canadian Shield and the Alberta foothills. After I arrived at Princeton, the GSC gave me a PhD-thesis mapping project along the continental divide in the southern Canadian Rockies. My GSC supervisor and prime mentor was Bob Douglas, a pioneer in elucidating the evolution of the Canadian Rockies. From 1958 to 1968, as a research scientist at the GSC, with Bob's support, I was given two regional mapping projects that spanned the width of the Canadian Rockies. One was along the U.S.A. border. The other, Operation Bow-Athabasca, a large helicopter-supported project to map the region between Banff and Jasper, included my esteemed colleague and close friend Eric Mountjoy and eight other GSC geologists. Besides these exceptional opportunities for a hands-on regional overview of the southern Canadian Rockies, I was also authorized to spend several summers studying thrust-related folding and the tectonic significance of meso-scale faulting and fracturing within this region.

At Queen's University I worked with many gifted graduate students, mainly in the Canadian and northern US Cordillera. I also collaborated with stimulating colleagues like Dugald Carmichael, John Dixon and Herb Helmstaedt. Co-supervision of eight graduate students with Dugald enhanced my appreciation of the beauty of metamorphic petrology and its utility in elucidating tectonic processes. My fruitful collaboration with Jim Monger on the evolution of the Canadian Cordillera began after I first moved from the GSC to Queen's and is still flourishing 35 years later.

Thank you GSA, and thank you all.

View the images along with the full text from Ray Price's Gold Medal Lecture at http://www.geosociety.org/awards/12speeches/GML-Penrose.pdf

# ARTHUR L. DAY MEDAL

**Presented to**
**John M. Eiler**

John M. Eiler
*California Institute of Technology*

### *Citation by Kenneth A. Farley*

It is a great pleasure for me to cite John Eiler as he is recognized with the Day Medal of the Geological Society of America. Simply put John is a remarkably creative scientist whose work has answered critical scientific questions and launched an entirely new branch of geochemistry. I'm fortunate to be able to say that John is a good friend and colleague — we have shared lab space for the last decade — and I have much enjoyed watching his career blossom from starting postdoc to preeminent scientist.

John's early work developing both laser fluorination and ion probe methods for oxygen isotope measurement of volcanic rocks and phenocrysts brought clarity to the long-standing question of the role of deeply subducted materials in the genesis of ocean island basalts. His survey of olivine phenocrysts in plume-related lavas and his detailed work on the Hawaiian islands showed unambiguously that some, but not all, hotspot lavas carry the "smoking gun" oxygen isotope signature of alteration at the Earth's surface. In some cases this signature reflects shallow-level contamination from the surrounding hydrothermally-altered volcanic pile, but in others the data demand a volumetrically-substantial component of subducted oceanic crust or sediments in the plume source region. The latter conclusion is of great importance because it provides critical insights to the origin of mantle plumes and settles a question to which decades of previous work using elemental and radiogenic isotope data had failed to bring closure.

A few years ago John started to move in an entirely different direction. While the fathers of stable isotope geochemistry like Harold Urey made passing reference to the importance of how isotopes distribute themselves *within* molecules, essentially all of stable isotope geochemistry over the last few decades has been concerned with the *bulk composition* of a sample. In a textbook example of thinking out of the box, Eiler focused his attention on the idea that the stable isotope *distribution* within the molecule carries extraordinarily useful information, and demonstrated that existing mass spectrometers were capable of reading this information back. His first foray into the field — the analysis of "clumping" of $^{13}C$ and $^{18}O$ in $CO_2$ and also in carbonate minerals — is in my opinion the single most important discovery in any area of geochemistry in the last decade. This work has led to the "clumped isotope thermometer" for calcium carbonate, a methodology that allows determination of mineral formation temperature without concern for the O isotope composition of the water from which the carbonate precipitated (indeed that composition comes out as a byproduct of the measurement). This is a revolutionary methodology — a true game-changer — and has already been applied to questions as diverse as the body temperature of dinosaurs, the paleo-elevation of the Bolivian Altiplano, and seawater temperatures in deep geologic time.

Not satisfied by this remarkable new technique, Eiler has now embarked on the study of the "isotopic anatomy" (the internal distribution of stable isotopes) in organic molecules. Given their diverse compositions and formation mechanisms, and their key role in many processes of interest in geochemistry, biology, chemistry, and even biomedicine, application of these methods to organic molecules has the potential to be an extremely rich new field of research.

We recognize members of our community with awards like the Day Medal because they remind us of why we all commit so much of ourselves to our work. The message to take away from John's work is this: even in a field that is more than 75 years old, there can be breakout discoveries that surprise, thrill and motivate all of us.

### *Response by John M. Eiler*

Thank you, Ken, for your kind and thoughtful citation. We should all have friends willing to fly across the country to say kind things about us in public.

I am greatly humbled and honored to receive the Arthur Day medal. Not least because of the close personal and scientific connections I feel to many of its past recipients: Harold Urey is the wellspring of almost everything I've done. Al Nier designed the mass spectrometers that are the foundation of most of my career. I've now spent half my life in work and friendship with various Caltech colleagues who are previous Day medal recipients – including my postdoctoral advisors Sam Epstein, Ed Stolper and Ken. And a dozen more former Day medalists have been important colleagues and scientific collaborators or sparring partners at various parts of my career. It is a beautiful thing to spend your life guided by brilliant, interesting people.

It is customary for the medalist to give a short account of his or her career, though I have to say mine has not been guided by any obvious theme or path. Frankly, it hasn't made a great deal of sense even to me. I was drawn into geology at Beloit college by the Pied Piper figure of Hank Woodard and the opportunities it offered for fishing. I moved to the University of Iowa to chase a girlfriend, who improbably agreed to marry me a number of years later, and is with us now with us as the beautiful woman in the front of the room. There, I concentrated on metamorphic petrology and geochemistry because Tom Foster and Mark Reagan are interesting, thoughtful fellows and their labs are in the basement and therefore stays cool in the summer.

My first introduction to the world of isotope geochemistry came during my Ph.D. training at the University of Wisconsin, in my home town of Madison. I owe much to my advisors there: John Valley taught me the meaning of a good measurement and the importance of technical innovations in geochemistry. Lukas Baumgartner introduced me to the world of deep, mathematically based analyses of geochemical and petrologic problems. I can't say I really have much of a head for this area, but you can't fault him for trying!

My move to Caltech as a postdoc opened my eyes to many areas of science and introduced me to a community of broad, critical thinkers who have taught me most of what I think about being a natural scientist. I spent the first few years of my time there

using stable isotopes to study the origin and evolution of basalt – something enabled by laser based techniques of oxygen isotope analysis, recently developed at Carnegie and Wisconsin.

After transitioning into my present role as a faculty member at Caltech, my career has wandered in a way that could seem unhinged to an outsider – from igneous rocks to martian minerals to molecular hydrogen in the earth's atmosphere. The biggest step in my career has been the decision to explore isotopic clumping or ordering in natural materials. This idea grew from several things: A close reading of Harold Urey's papers in the chemical physics of molecular hydrogen, written in the 1930's. The example of the great Sam Epstein, who's own career was marked by free exploration of previously unmeasured things. And my realization that common gas source mass spectrometers should be easily converted to measure multiply substituted molecular gases. Beyond that, I can't say I gave the whole issue much thought, other than to find it inspiring that so little was known about these ubiquitous, diverse and peculiar isotopic creatures. An irrational choice, but as they say: sometimes it is better to be lucky than good.

I'ld like to close by expressing my deep gratitude to the people of the GSA for maintaining the traditions of the Arthur Day medal, which honors the memory of a great experimental petrologist, geochemist and leader in the earth sciences. Finally, my thanks to all of you for coming to participate in the medal award ceremony.

# YOUNG SCIENTIST AWARD (DONATH MEDAL)

**Presented to**
**Katharine W. Huntington**

Katharine W. Huntington
*University of Washington*

### *Citation by Kip V. Hodges*

Katharine Huntington, this year's Donath Medalist, is an extraordinary young scientist who works to understand how climatic and deformational processes influence the evolution of mountainous landscapes. Each year the Donath Medal (or Young Scientist Award) honors the accomplishments and promise of the recipient. But, more indirectly, the medalist selection process is an endorsement by the Geological Society of America of *how* the recipient does science.

I intersected with Kate's career arc a few years ago when she elected to come to MIT to work on a Ph.D. project under my supervision in the field of tectonics. We share the belief that this is perhaps the most transdisciplinary field in all of the earth sciences. Continental tectonics is sometimes described as regional structural geology, but it is really much more than that. I think of it as the broader study of the chemical, physical, and thermal evolution of the lithosphere and asthenosphere.

To gain traction in that intellectual domain, you must be a polymath. Yes, observational field geology is key, but equally important are geochemistry, geochronology, geodesy, geomorphology, geophysics, petrology, sedimentology, stratigraphy, and thermochronology. And, of course, data from all those sources must be interpreted in the context of theory, which means that many of the best tectonicists these days are power users – if not developers – of increasingly sophisticated thermal-mechanical models.

From the very beginning of her graduate career, Kate appreciated the need for an expansive view. She learned quickly that the nature of a tectonic problem dictates the approach she must take to address it. Like a good mechanic, she knows that it is unwise to begin a job without the proper tools, and even more unwise to try to use a tool you don't understand. And she knows that sometimes, when the proper tool doesn't exist, you have no choice but to invent it yourself, a process that can sometimes take you far afield from tectonics.

Without doubt, one of the most fascinating developments in the earth sciences over the past decade is the realization of an apparent interdependence of climatic and tectonic processes in orogenic systems. We are stlll far from deciphering the precise nature of this relationship, but the potential ramifications are staggering.

If tectonics is becoming a field in which understanding atmospheric thermodynamics could be as important as understanding structural geology, the cognitive load of tectonics research could be growing exponentially. You can be sure that it will be scientists like Kate who demonstrate the courage to take on that load, even if it means happily accepting dramatic changes in her career trajectory.

This afternoon, Kate will share some of her work with us, but I daresay this talk might be dramatically different if it took place five years from now. That's just the way it is with all the best scientists.

Ladies and gentlemen, join me in welcoming this year's Donath medalist, Katharine Huntington.

### *Response by Katharine W. Huntington*

Thank you Kip, for your kind introduction, and thanks to GSA and Dr. and Mrs. Fred A. Donath for supporting this award.

Dr. Donath is recognized internationally for his great contributions, not only to studies of faulting and experimental rock deformation, but to education, and to advocacy for the role of science in public policy decisions. I am truly honored to receive an award bearing his name.

And I wouldn't have this honor without the efforts of the Awards committee and my nominators, John Eiler, Kip Hodges, Brian Wernicke, Kelin Whipple, Todd Ehlers, and Jay Quade. Thank you.

Growing up with a high school Earth science teacher for a mom, and a poli-sci professor for a dad, I was probably always destined to be a scientist and educator. Although I "rebelled" in college and majored in Economics at UNC Chapel Hill, I came to my senses in an intro Geology course taught by Tim Bralower, and encouraged by Kevin Stewart and Jonathan Lees, I went to MIT to study Himalayan tectonics and erosion with Kip.

Though I'm only half joking when I refer to getting a PhD at MIT as a soul-crushing experience, it's an experience I wouldn't trade for the world. I am grateful to my peers for being curious and generous, and thank both Kip and Kelin Whipple, as well as David Mohrig and Todd Ehlers, for encouraging my curiosity and independence, and for helping me develop my skill for science – from picking good problems, to thinking "big picture," and effectively communicating the results.

After MIT, I switched fields, and field areas, to become a postdoc fellow at Caltech, where I studied clumped isotopes and Colorado Plateau uplift with Brian Wernicke and John Eiler. I think of Caltech as sort of a postdoc heaven—not because spending 19-hours stuck in the basement lab on a Sunday is my idea of heaven—but because of the vibrant postdoc community I got to be a part of there. I thank Brian for encouraging me to try something new, and John for helping to educate a humble tectonicist / geomorphologist / thermochronologist in the ways of stable isotope geochemistry.

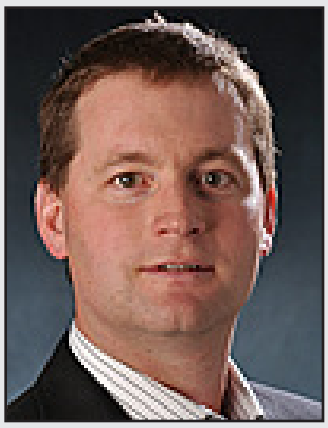
In 2008, I joined the University of Washington, where my colleagues and collaborators at UW and beyond have included and supported me to the fullest, my students have challenged me and made me proud, and my peer-mentoring network has helped me find the right path every step of the way. I could not have imagined how rewarding this would turn out to be. I thank ACS-PRF for its support, NSF-Tectonics program CAREER award for giving me license to work on not just research but high school teacher outreach, and NSF-IF for helping me take the plunge on building a lab of my own.

I thank my son for sleeping through the night (at least occasionally) and my husband Geoff—a PhD rocket scientist—for everything from babysitting at a past GSA meeting to giving me the optimism to turn challenges in both science and in life into opportunities.

Finally, thank you all for being here, and thanks again to GSA for this honor.

# GSA PUBLIC SERVICE AWARD

**Presented to**
**Roger A. Pielke, Jr.**



Roger A. Pielke, Jr.
*University of Colorado/ Center for Science and Technology*

### *Citation by Daniel Sarewitz*

The openness and integrity of science, and especially of the Earth sciences, have no stronger champion than Roger Pielke, Jr., recipient of the 2012 GSA Public Service Award. As the relations between science and politics have become more contested and complex, Roger's work as a scholar and public intellectual stands out for its crystalline brilliance and fearless honesty. His book *The Honest Broker* changed the way that scientists and politicians can make sense of one another. His analyses of natural hazards and energy technology have opened pragmatic new pathways for climate change policy that lead away from the gridlock of the past twenty years. His thousands of blog posts, with their phenomenally broad readership, continue to galvanize democratic dialogue about the role of science in our world. I am privileged and humbled to have Roger as a colleague, and proud of GSA for recognizing his service to science and society.

### *Response by Roger A. Pielke, Jr*

While in college in the late 1980s I worked as a student assistant doing FORTRAN programming for the Atmospheric Chemistry Division at the National Center for Atmospheric Research. There I was surrounded by world-leading scientists doing research related to stratospheric ozone depletion. I remember hearing these scientists observe that policy making would be much improved if only politicians had a better understanding of science.

That set me on a path in graduate school to learn a bit about policy making before, I then thought, returning to the physical sciences.

Along the way I had a chance to go to Washington, DC with Radford Byerly when he left a position at the University of Colorado to serve as chief of staff to Congressman George Brown, who had become chairman of the House Committee on Science and Technology. There I was surrounded by top science policy makers grappling with the early days of post-Cold War science policies.

One day after a long hearing on some complex issue, I distinctly remember sitting in a corner of Rad's office while the top staff — including lawyers and PhD scientists — observe that policy making would be much improved if only scientists had a better understanding of politics. It was that very moment that set me on a course of scholarship and practice at the messy intersection of science and politics.

Today, many of our most contested policies involve an element of the scientific or technological, and often more than that. I am firmly of the belief that science and technology matters a great deal to our ability to make good decisions, and as a consequence, experts have an obligation to participate in the political process. At the same time, how experts engage in policy and politics can lead to better or worse outcomes. Consequently, the messy intersection of science and politics is not just a fascinating area of study, but one that has important contributions to make to real-world decision making.

I thank the GSA for this recognition, which of course reflects the collaboration and support of a great number of friends, colleagues and others.

# BROMERY AWARD FOR THE MINORITIES

**Presented to**
**Kenneth D. Ridgway**

Kenneth D. Ridgway
*Purdue University*

### *Citation by Sarah M. Roeske*

Ken Ridgway is most deserving of this award. He is a Native American, of the Lenape (Delaware) tribe, who excels in both categories of achievement described for the Bromery award, with his significant research career as well as his active role in recruiting all minorities into science and engineering. I find it very fitting that I introduce Ken for this GSA award, because it was at GSA national and Cordilleran section meetings that I met him and had the first of many fun and thought-provoking discussions. My citation includes comments provided by his other nominators: Marilyn Suiter, Terry Pavlis, and Laura Serpa.

Many of us know Ken Ridgway, Professor at Purdue University, as an outstanding clastic sedimentologist whose research contributions are significant and wide-ranging, working on his own, and more commonly mentoring students on projects from Death Valley to Taiwan, in addition to numerous projects over much of Alaska. He thrives on field work, and leads many class field trips, often driving long distances to expose Purdue students to diverse geology. He also generously makes time to discuss research with students and colleagues from a wide range of backgrounds. One of the topics I have enjoyed seeing him pursue is what fundamentally controls basin development on a plate scale, considering everything from topographic load to mantle flow. Over the years he seeks broader connections among diverse groups, including sedimentologists, geochronologists, structural geologists, geophysicists and geodynamicists to address this and other questions. He excels at seeing the common threads in people's research and getting people to cooperate, and his enthusiasm moves everyone forward. Thanks to my interactions with Ken, I have grown to appreciate how powerful a tool sedimentology and basin analysis can be for recording tectonic events.

The other Ken, for perhaps there are two? somehow also finds time for another career, mentoring high school and college minority students in natural sciences and engineering. He participates in professional societies such as the Society for Advancement of Chicanos and Native Americans in Science (SACNAS) and the American Indian Science and Engineering Society (AISES), and he is a recipient of and continues to support the Minority Participation Program (MPP) scholarship from the American Geological Institute (AGI). He has also become involved in a consortium of schools (San Francisco State, UT El Paso, University of New Orleans, and Purdue) that take minority high school students on a multi-week earth science field trip through the west. His most unique contribution is a program he created at Purdue in which he recruits and mentors Native American students to conduct research projects on their tribal lands, making them science experts in topics that matter to their community.

In sum, I am so pleased the Bromery Award committee recognizes his scholarly achievements and his hard work for all minorities. His mentoring supports so many students, and his creativity and enthusiasm for earth science benefit all who work with him.

### *Response by Kenneth D. Ridgway*

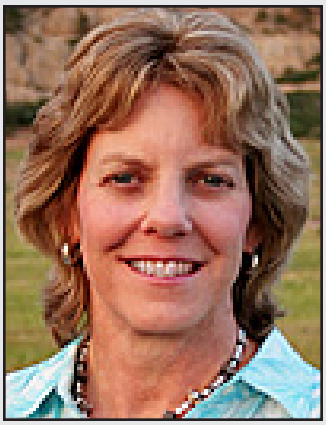
I am deeply honored to be the 2012 Bromery Award recipient. I very much appreciate both Sarah Roeske for her kindness in nominating and citing me for this award, and the letter writers who supported my nomination. I would also especially like to thank the Bromery family for establishing this award. I'm receiving this award in part for my outreach activities with Native American students and their communities. Working with Native students, often in the context of studying the geology of their reservations, I get to see firsthand how Western science and Native Americans' view of the earth often dovetail.

As an example, several summers ago while teaching on a reservation, we were mapping one of the large normal faults that characterize the Colorado Plateau. This fault controls the distribution of springs across this part of the plateau. These springs in this arid landscape have traditionally been and remain the lifeline of the local Native communities. Much of their cultural identity is directly linked to the springs. The day that I'm referring to was just a perfect earth science field day; I was guiding the students on making a geologic map of the fault, we were identifying fault breccia and slickenlines, and discussing the earthquake cycle. As part of this exercise, elders of the community were also with us and discussing their perspective on the land. At one point I asked one of the elders the Native name for the high peak within this anastomosing fault zone and he tells me in their language the name of this peak translates as "Thunder in the Mountain". The answer initially stunned me and my first coherent thought was "now here is a teaching moment for *everyone*". For me the teaching moment was the striking merger of different perspectives on a landscape. Here was the Native American panoramic view of giving a name describing what I interpret as representing geologic processes in a fault zone. This teaching moment made me contrast that perspective with the classical geologic approach I was teaching the students of starting with the orientation of the fault plane, measuring slickenlines, determining stratigraphic displacement, etc., all data that then get pieced together later to form the panoramic view. Here were two very different approaches but both ended up with the same basic interpretation of earth processes.

My point in this example is that as earth scientists we have this privilege of studying an amazing planet. This privilege connects us with all of the Earth's landscapes and with all the human communities that live in these landscapes. As you know, we have a great science and I hope that as the GSA community we continue to connect our science in meaningful and respectful ways to all people. Thank you again for this award, it means a great deal to me.

# GSA DISTINGUISHED SERVICE AWARD

**Presented to**
**Elizabeth (Lisa) Norby and Bob Stewart**



Elizabeth (Lisa) Norby
*National Park Service, Geologic Resources Division*

Bob Stewart
*ExxonMobil Exploration Company*

### *Citation by Matthew Dawson*

Congratulations to Lisa Norby, of the National Park Service, for earning GSA's Distinguished Service Award. I'd like to thank Lisa for her contributions to GSA's education efforts, particularly the GeoCorps America internship program. GeoCorps has seen dramatic growth and improvement since Lisa became involved in 2007. The number of interns placed in National Parks has grown from 16 per year to over 90, and in that time span, over 300 GSA members have completed GeoCorps internships in National Parks. GeoCorps interns are more diverse than ever because of Lisa's outreach to groups underrepresented in geoscience. Lisa has also provided new mentoring tools and increased the variety of intern positions, thus providing even better opportunities for GSA members to expand their geologic knowledge while gaining real-world experience working for government agencies that manage the nation's natural resources. Thank you, Lisa, for your service to the professional development of so many GSA members, and for your service to America's public lands!

### *Response by Lisa Norby*

I am humbled to receive the 2012 Distinguished Award. Over the past six years I have been working closely with GSA staff to advance opportunities for geoscience students and to advance STEM literacy. Through the National Park Service's partnership with the GeoCorps America Program, we are addressing parks critical geoscience needs, and in 2012, over 100 projects were completed in national parks. Since the program's inception in 1996, we have been able to fill over 800 internships with highly qualified and budding Earth scientists. Thanks to the vision and leadership of the GSA we are striving to increase the diversity of our workforce. Our hope is that through our collective efforts we will someday make the geoscience workforce look like the face of America. Our continued efforts to increase educational opportunities such as Earthcaching in parks is making geology both exciting and relevant. It is a pleasure to work every day with such capable and dedicated staff at the Geological Society of America. Thank you very much.

### *Citation by Lori L. Summa*

It is my pleasure and honor to present the citation for Mr. Bob Stewart, recipient of a 2012 GSA Distinguished Service Award. Bob's dedication and service to GSA's students is exemplary. In his role as Supervisor of Global Geoscience Recruiting for ExxonMobil, Bob has taken on the personal challenge of promoting science education for the next generation. He has volunteered countless hours to GSA programs for students, developing and supporting short courses at GSA Annual Meetings, the annual Bighorn Basin Field course, Field Camp Scholars awards, and most recently, a new field safety award. These activities represent a truly unique contribution to GSA's core mission of providing professional growth opportunities for earth scientists, all taken on with an excitement and humor that is much appreciated by the students.

### *Response by Bob Stewart*

As I thought about this award, it struck me that it should be called the GSA Collaboration Award. ExxonMobil and GSA have worked together on many shared issues, such as, Geoscience education, field based education, field safety and diversity. I'd like to thank GSA for fostering a climate of collaboration. Many societies look at a company like ExxonMobil as a cash cow, but GSA has looks at our relationship as a joint effort. I want to thank ExxonMobil for financially supporting our efforts, and especially I want to thank Lori Summa who has been involved very step of this journey and is every bit as deserving of this award as I am. Finally, and most importantly, I'd like to thank my wife Jenny for her years of support and love. This would never have been possible without your understanding. Through our many joint programs, GSA and ExxonMobil have had some impact. However, this journey is not complete and I look forward to continuing it.

# SUBARU OUTSTANDING WOMAN IN SCIENCE AWARD

**Presented to**
**Phoebe A. Cohen**

Phoebe A. Cohen
*Massachusetts Institute of Technology*

### *Citation by Warren D. Allmon*

Very occasionally a young person comes along who truly stands out, who has the right combination of intelligence, creativity, motivation, and enthusiasm to give them extremely high potential to contribute to your field – in my case paleobiology. I have not met many of these in my 20 year career – perhaps 3 or 4. Phoebe Cohen is one of them. She is one of the most extraordinary young people I have ever met, with the potential to rank among the very best in our field.

Phoebe was an undergraduate student in two classes that I taught at Cornell. She then approached me about sitting in on my graduate student seminar during her senior spring semester. After graduation I hired her as my assistant, a position she filled for two years before going to graduate school. During her time in grad school at Harvard we stayed in fairly regular contact. In addition to having dinner at GSA meeting every year, I usually asked her for the latest information in her specialty of late Proterozoic paleontology to integrate into my teaching, and she usually solicited my advice on issues from academic politics to career options. We published a paper together based on work she did while at PRI. I have therefore long valued her as a scientific colleague.

During her time as my assistant, Phoebe almost literally did everything — from building exhibits to fixing computers to editing publications to assisting me with my personal research. She did everything I needed, usually better than I could have imagined, and then looked for additional challenges which she has also accomplished with great skill. As a scientist, Phoebe has made a real name for herself at a very young age, and established herself as an emerging "star" in the high-profile topic of Precambrian paleontology. She has contributed significant new observations and interpretations, and — just as importantly — presents them clearly in the context of the broader issues that Proterozoically-challenged colleagues like me are interested in. In her last year in grad school I invited her to come back to Cornell to give a departmental seminar — her first such talk — and she handled it like the seasoned professional she had already become.

In addition to all of this, Phoebe's interests are much broader than just paleontology, which is the real justification for her receiving this award. She is passionate about teaching, about public understanding of science, about social and political issues, and in that hackneyed but in this case fully appropriate phrase, about "wanting to make a difference". Her move to Williams College this fall — which was so richly deserved and delightful to all of us who know her — gives her another prominent and, I hope, long-term platform to continue to do just that.

I cannot take a bit of credit for Phoebe and her accomplishments, but it has been a great pleasure to watch her do so many things so well. I hope to continue to be able to do so for many years into the future. Congratulations, Phoebe, on this enormously well-justified recognition.

### *Response by Phoebe A. Cohen*

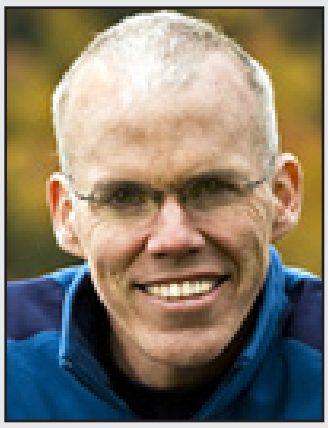
Than you Warren, for your kind words. I am honored to be presented with this award by the society and appreciate GSA's dedication to supporting young women scientists.

I am here today because of the steadfast support of a huge number of mentors. As an undergraduate, these most importantly included Warren, who first sparked my love of paleontology, as well as Alex Moore, who exposed me to the interconnected systems of the Earth sciences and gave me an amazing model of what it meant to be an educator. In graduate school, I had the wonderful mentorship of Andy Knoll, who drove me to think deeply about the co-evolution of earth and life and allowed me to truly make my research my own. During my time in graduate school, I was able to tackle big issues in Neoproterozoic paleontology and mold my own vision of my research - one that combines field work, analytical tools, microscopy, and a deep appreciation for the insights of modern biology. Andy also provided me with the camaraderie of our lab, "Team Knoll", from whom I learned more than I ever could in any lecture hall. This team included my peer mentor, dear friend, and collaborator Robin Kodner who continues to motivate and inspire me. Harvard also provided me with the guidance, support, and friendship of Charles Marshall, Francis Macdonald, Dave Jones, and Dave Johnston, many of whom I am now fortunate to include as colleagues. I was also blessed with a wide support network of paleontologists and geoscientists beyond my graduate institution including Bob Gaines, Seth Finnegan, and Shanan Peters, who broadened my horizons as a scientist and continue to help me move forward in my profession. I would also like thank my post doc advisor Roger Summons for giving me the freedom to find my own path as a scientist, and for nominating me for this award.

Lastly, I would like to acknowledge my incredibly supportive and caring parents Carl and Suzanne, and my boyfriend Zeke. My parent's unending support of everything I've done truly buoyed me up during the tougher times of graduate school, while Zeke has remained my steadfast companion as I have follow my passions, even when they take me to places only reachable by helicopters and satellite phones. Thanks for always picking me up at the airport, no matter how long it had been since I'd showered.

# GSA PRESIDENT'S MEDAL

**Presented to**
**Bill McKibben**



Bill McKibben
*Environmentalist, author, and journalist*

### *Citation by John W. Geissman*

Mr. President, Ms. President Elect, colleagues, friends….

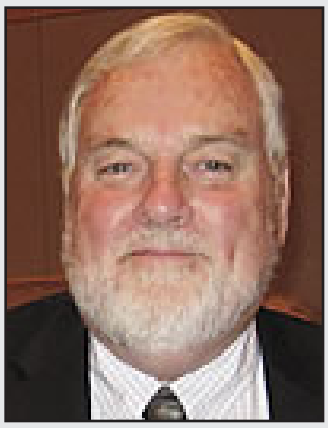
Everyone has the opportunity to contemplate crowning achievements in life, and this is as good as it gets for me. I stand next to a truly remarkable human being, who is greatly deserving of the President's Medal from the Geological Society of America. Let me introduce Mr. Bill McKibben, Schumann Distinguished Scholar at Middlebury College. He is the author of over a dozen books on the environment, beginning in 1989 with *The End of Nature*. His most recent book, *Eaarth*, describes the new planet that we and our children and maybe their children will inhabit in the not too distant future. He is the founder of 350.org, an ever-growing grassroots climate campaign that has coordinated literally thousands of peaceful rallies in over 190 countries since 2009 to draw attention to the rapidly changing environment in which we live and we have affected. President of the Harvard Crimson newspaper in his undergraduate years, he holds honorary degrees from over a dozen colleges and universities. In 2011, he was elected a fellow of the American Academy of Arts and Sciences. He has been awarded Guggenheim and Lyndhurst Fellowships and won the Lannan Prize for nonfiction writing in 2000. Despite the many differences that may exist in our convictions, I think that it is safe to say that we all share one thing in great common. If you stood on a spot on the surface of our home (the only one we will ever have) where no other human has set foot, you would gather all of it in, cherish it and relish the experience forever. Tenzin Gyatso wrote, "We are visitors on this planet. We are here for one hundred years at the very most. During that period we must try to do something good, something useful, with our lives. If you contribute to other people's happiness, you will find the true meaning of life." I think that you will agree with me that the recipient of the 2012 President's Medal of the Geological Society of America has indeed done something exceptionally useful with his life. It is a true pleasure and true honor to present the President's Medal to Bill McKibben. Bill, thank you!

### *Response by Bill Mckibben*

This is an extraordinary honor, for which I am deeply grateful. And I am even more grateful for the work that the members of this society, and their fellow geologists around the world, have carried out in helping us understand this remarkable moment in the history of our sojourn on this planet. In my work as a writer I've tried to understand and interpret the work of earth scientists as they grapple with the unprecedented task of observing planetary transitions in real time. And with millions of people around the world I've been privileged to try and take that work and build from it the kind of defense that I think our planet needs--a swift, confident swing away from the energy sources of the last few hundred years, and towards the next stage in our progress as a civilization. It's for all those people that we work with at 350.org that I accept this great honor, and give my deepest thanks to all of you

# AGI IAN CAMPBELL MEDAL

**Presented to**
**Gordon E. Brown, Jr.**



Gordon E. Brown, Jr.
*Stanford University*

### *Citation by Georges Calas*

I am pleased to nominate Prof. Gordon Brown, Dorrell William Kirby Professor of Earth Sciences and Chair of the Department of Geological and Environmental Sciences at Stanford University, for the Campbell Medal. Gordon Brown deserves this honor by the importance of his service as a geologist, educator, administrator, and public servant. For more than 45 years, he made major contributions at the interface between Earth and Environmental Sciences, Physics and Chemistry, concerning a broad range of fundamental questions and societal issues. Gordon Brown was always devoted to the public service: at Stanford and SSRL, at NSF and DOE and in scientific organizations, as MSA. Such a broad activity illustrates the way Gordon Brown does science: having excellent and original ideas, teaching students, sharing and communicating, and working hard, including nights on synchrotrons…

The first recipient of the Campbell Medal, in 1981, was Dick Jahns, a former student of Ian Campbell at Caltech and Dean at Stanford. Gordon was close to Dick. He and Rod Ewing edited the Jahns Memorial Volume of the American Mineralogist.

I am deeply honored to give this citation and it is very fitting that Gordon Brown is receiving the AGI Medal in Memory of Ian Campbell.

### *Response by Gordon E. Brown, Jr.*

I wish to thank the Executive Committee of the American Geosciences Institute for selecting me for this high honor. I also wish to thank my friend and scientific collaborator Prof. Georges Calas of the University of Paris VI and others for nominating me for the Ian Campbell Medal, and for Georges' kind words as my citationist. As will become evident, my career has been influenced by several early recipients of the Ian Campbell Medal as well as by others, including Georges.

In 1964, while an undergraduate at Millsaps College in Jackson, MS, I had the pleasure of meeting Richard Jahns, the first Ian Campbell Medalist. It's worth noting here that Dick had a connection with Ian Campbell, who taught him mineralogy as an undergraduate at Caltech. This experience helped convince Dick to switch from chemistry to geology as a major. Many years later, Dick's Sigma Xi lecture at Millsaps College on granitic pegmatites sparked my interest in combining my chemistry and geology background in graduate school, and I entered the Ph.D. program in Geochemistry and Mineralogy at Penn State in 1965. That proved to be an excellent choice for me even though Dick had moved to Stanford as Dean of the School of Earth Sciences just prior to my arrival at Penn State.

I worked with Jerry Gibbs at Penn State and embarked on a M.S. thesis project in x-ray crystallography, which was one of the specialities of Ian Campbell. I also benefitted from classes from and discussions with the late Rustum Roy, one of the pioneers in materials research, as well as Will White, who sparked my interest in mineral spectroscopy. I accompanied Jerry Gibbs to Virginia Tech in 1966 and obtained M.S. and Ph.D. degrees there under his guidance in 1968 and 1970, respectively. Following post-doctoral work at SUNY Stony Brook on the Apollo 12/14 lunar samples and on development of high-temperature x-ray diffraction methods with Charlie Prewitt and Jim Papike, I took my first academic position in 1971 at Princeton University, where I had the pleasure of getting to know Hollis Hedberg, the second Ian Campbell Medalist. Hollis and other emeritus professors and I often had morning tea together in the ore deposits collection room of Guyot Hall and discussed the development of the theory of plate tectonics, particularly the role played by Harry Hess in developing the concept of sea-floor spreading.

Dick Jahns entered my life again in 1971 when he invited me to Stanford to give a seminar. I was offered a faculty position at Stanford after having been at Princeton for only three months, but I declined this offer and settled into teaching and research at Princeton. During a second visit to Stanford a year later, I met Konrad Krauskopf – the third Ian Campbell Medalist – who took me on a short field trip in the California Coast Range and, together with Dick Jahns, and Bill Luth, convinced me to leave the tectonically inactive east coast and come to the earthquake-prone Bay Area. I made this move mainly because of the excitement I felt about the interdisciplinary research that has become a characteristic of Stanford University. My 40 years at Stanford have been filled with many intellectually stimulating collaborations with Stanford colleagues in the geosciences, particularly George Parks, as well as materials scientists, chemists, microbiologists, physicists, and electrical engineers. These collaborations tackled complex mineralogical and geochemical problems that required an interdisciplinary approach.

Early in my Stanford career, I became involved in the first major synchrotron user facility – the Stanford Synchrotron Radiation Lightsource (SSRL) – which produces extremely intense x-rays that can be used to study matter of all types under conditions ranging from the high temperatures of silicate melts in Earth's crust to the extremely high pressures of Earth's core. These powerful x-ray sources, now numbering about 80 worldwide, can also be used to study biogeochemical processes under conditions typical of the *Critical Zone* where the seven billion human inhabitants of Earth live. I was fortunate to have helped in founding the GeoSoilEnviro-Consortium for Advanced Radiation Sources (GSE-CARS) at the Advanced Photon Source at Argonne National Laboratory, which was led by the late Joe Smith of the University of Chicago, and in developing a new interdisciplinary research area referred to as Molecular Environmental Science that resulted in new synchrotron beam line facilities at SSRL at SLAC National Accelerator Laboratory and the Advanced Light Source at Lawrence Berkeley National Laboratory. These national scientific facilities have been used by thousands of geoscientists and scientists and engineers from other disciplines to study problems ranging from the structure-property relationships of silicate minerals and melts, the aging of pits of US nuclear weapons, the structure of proteins, and the structure of oxide catalysts, to the speciation of high-level nuclear waste, minerals under conditions characteristic of Earth's core-mantle boundary, the structures

and environmental transformations of engineered nanomaterials, and the interaction of environmental contaminants and bacteria with mineral surfaces. It is in this last area that I have focused much of my research over the past twenty years, working with many very bright graduate students and postdocs and with Georges Calas and his group at the University of Paris VI and VII.

I have indeed been lucky to have worked in a stimulating environment at Stanford University on a variety of Geoscience problems at the boundary with other disciplines with many collaborators. I have also served on many advisory committees and organized a number of workshops at the National Science Foundation, the Department of Energy's Office of Science, and many national laboratories over the years, which have given me the opportunity to represent the Geosciences community in a variety of multidisciplinary research contexts.

Again, I am honored to receive this prestigious award from AGI in recognition of my service to the Geosciences and feel very fortunate to have had many opportunities to represent the Geosciences community in broader arenas of science and engineering at the national level.