

Connolly and Hirschmann Receive 2011 N. L. Bowen Awards

James A. Connolly and Marc M. Hirschmann received the 2011 N. L. Bowen Award at the 2011 AGU Fall Meeting, held 5–9 December in San Francisco, Calif. The award recognizes “outstanding contributions to volcanology, geochemistry, or petrology.”

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Citation for James A. Connolly

It is an honor to introduce Jamie Connolly, winner of the 2011 N. L. Bowen Award of the AGU Volcanology, Geochemistry, and Petrology section. The Bowen award recognizes outstanding contributions in a paper or series of papers. On this basis, Jamie is doubly worthy of this honor.

Jamie Connolly is perhaps best known for creating and maintaining PERPLE_X, a package of computer codes modestly billed as having the purpose of “calculating and displaying phase diagrams, phase equilibria and thermodynamic data.” But Jamie showed us that there is more. By including key geophysical parameters, he linked petrology with geodynamical modeling of planetary interiors. Jamie’s approach has transformed our understanding of the links between petrology, seismology, and rheology in such important environments as subduction zones and the upper mantle.

Jamie Connolly has also made fundamental contributions in a second area: crustal fluid flow. He was among the first to understand and explore crustal fluid flow via the dynamical approach of Dan McKenzie, Frank Richter, Dave Stevenson, and others, on compaction and porosity waves associated with melt production and migration. Jamie showed that fluid expulsion during metamorphism or sediment lithification is governed by deformation through a rock’s resistance to compaction. He showed that, for compacting rocks, compaction can sustain high fluid pressure and lead to solitary waves of porosity that propagate independently of the reaction that produced the fluid. His contributions provided the first truly dynamic insights into this complex process.

In working at the interface between petrology and geodynamics, Jamie Connolly has advanced both fields through fundamental and rigorous contributions that offer deep understanding of crustal and mantle processes. It is this philosophy that spurred

Norman Bowen, who would surely recognize a bit of himself in so accomplished a scholar as Jamie Connolly.

—CRAIG E. MANNING, University of California, Los Angeles

Response

Thank you, Craig, for the kind citation. I am honored to receive the Bowen Award. An award makes you ponder your own merit, so the nice thing about it is the realization that someone else has gone to the trouble of doing that for you and decided favorably. I am grateful to everyone involved in the nomination and evaluation process, and the Volcanology, Geochemistry, and Petrology section, for allowing me to savor that realization.

How did I get here? I wish I could say I had some grand scheme, but the path I followed is better described by the word career as a verb than as a noun. I cannot thank everyone who has helped me, so I will restrict myself to three individuals who determined the main directions of my career. The first is Derrill Kerrick, my Ph.D. advisor at Pennsylvania State University. When I arrived at Penn State I was already fascinated by phase diagrams, but I thought it was a passion that should not be admitted in public. Without Derrill I would never have come out of the closet, nor would I have learned how to water ski or calculate seismic wave speeds. The second person is Alan Thompson, my postdoctoral mentor, whose swashbuckling cross-disciplinary raids made me realize that petrology, geodynamics, and geophysics are intimately related. Alan and Derrill introduced me to different worlds. Fourteen years ago, Yuri Podladchikov dragged me out of my office and began teaching me how to connect those worlds. I am pleased that he has not given up on that project.

In closing, I acknowledge the Swiss Federal Institute of Technology (ETH) Zurich. It attracts outstanding students who have done much to educate me; and not only is it large



James A. Connolly

enough that you can find the answer to any question there, but also it is large enough to tolerate my idiosyncrasies.

—JAMES A. CONNOLLY, Institute of Geochemistry and Petrology, Swiss Federal Institute of Technology (ETH) Zurich, Zurich, Switzerland

Citation for Marc M. Hirschmann

I am delighted and honored to give the citation for Marc Hirschmann’s Bowen award. Marc and I were graduate students together in Seattle, where he was advised by Mark Ghiorso. Marc achieved a Pro-methean feat as a postdoc, “carrying the flame” of techniques developed at Berkeley to Ed Stolper’s Harvard-trained group at the California Institute of Technology. Together, Hirschmann and Stolper wrote a classic paper on melting of mafic veins in the mantle. They showed that thermal diffusion into veins would offset the heat of fusion, leading to a superadiabatic PT path. This was unanticipated but seemed immediately obvious once stated.

Moving to Minnesota, Marc became an experimental petrologist and set out to quantify melting of mafic rocks under mantle conditions. Given the diversity of mafic lithologies, I was afraid that Marc would get lost. Instead he and his students delineated quantitative, general properties that apply to a wide range of compositions. The resulting data underpin much recent work on melting of two-lithology sources in the mantle.

Marc then investigated the effect of water and carbon dioxide on mantle melting, the latter mainly with Raj Dasgupta, also an exceptional scientist. Again, tackling this topic using natural compositions posed the risk of getting lost, but instead they discovered valuable guidelines.

Marc has become a sought-after expert on volatile cycling in the Earth. De facto, he has been appointed by consensus to a role that few attain, the small group whom we treat as authorities on the entire Earth system. It's a select group, a really rare honor.

As a result of this success, achieved with grace and without rancor, Marc was called to fulfill many leadership roles in our community, for example, serving on the MARGINS Steering Committee. While generally I am not happy to be steered, I was relieved to see Marc in these roles and trusted him for unbiased, well-informed, proactive leadership.

I am honored to know Marc, and I feel privileged to have played a role in celebrating his well-deserved Bowen Award.

—PETER B. KELEMEN, Lamont-Doherty Earth Observatory, Columbia University, Palisades, N. Y.

Response

I kind of took the long route to my career, so I don't have time to mention everybody

who inspired me. Were it not for Ian Carmichael, I wouldn't have become a petrologist. I learned a ton about rocks and had great arguments with Charlie Bacon in two summers at Crater Lake. Mark Ghiorso taught me the interior secrets of quantitative petrology, and Ed Stolper's high expectations showed me a new level of rigor and how to ask bigger questions.

At Minnesota they solved our two-body problem even though there was supposed to be one job. Then we showed up with an infant, and still they were more than welcoming to all three. There, I've benefited from the great mentorship of David Kohlstedt and Larry Edwards and from a string of students and research scientists who, of course, do most of the work: Maik Pertermann, Jen Engstrom, Raj Dasgupta, Sandeep Mukherjee, Travis Tenner, Fred Davis, Ben Stanley, Hongluo Zhang, Patrick Hastings, Johnny Zhang, Dimitris Xirouchakis, Tetsu Kogiso, Ken Koga, Tony Withers, Cyril Aubaud, Paola Ardia, Haijin Xu, Anja Rosenthal, and at least that many undergraduates. I could tell stories about them all, so I'll just say that if it weren't for Tony Withers, my research enterprise would be a total failure.

I think of geology as the family adventure, and so I'm grateful that Donna and Naomi are with me on the ride. And I'm humbled to receive an award given previously to so



Marc M. Hirschmann

many illustrious people, and I feel particularly lucky that I've had the benefit of friendship with or mentorship from quite a few of them. I'm even more humbled when I think of some of my peers who have not received this recognition but are certainly more worthy than I.

Thank you.

—MARC M. HIRSCHMANN, University of Minnesota, Minneapolis