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Christian Huber receives 2010 Paul Niggli medal

The Paul Niggli medal is Switzerland's most prestigious award for a young Earth scientist. It is awarded every year to a young Swiss, who made an outstanding contribution to mineralogy, crystal chemistry, petrology, resource geology or exploration physics. It is worth mentioning, unfortunately, that the number of potentially qualified candidates for this award is decreasing due to the very international population in Earth Sciences at Swiss universities.

Citation

The award of the 2010 Niggli medal to Christian Huber was based not on the promise of future scientific productivity, but for a body of already published work in the area of applying numerical models to magmatic and other geologic processes since he received his PhD from the University of California, Berkeley, in mid-2009. He works in the challenging domain of constructing quantitative models for multi-phase flow regimes in magmas that are variably rich in crystals and/or gas bubbles, and which consider all thermal and mechanical aspects of dynamically evolving magmatic systems. Christian has achieved all this in part by becoming a leading exponent of Lattice-Boltzmann modeling, a mathematical method that is gaining wide acceptance in the physical sciences.

Christian completed his Bachelors degree at the University of Geneva in 2001, and a Masters on the topic of Volcanic Seismology in 2004, in collaboration with Bernard Chouet (USGS, Menlo Park, CA). He then undertook the important step of augmenting his quantitative skills with a Bachelors degree in Physics at the University of Geneva. In 2004, he joined Professor Michael Manga at UC Berkeley. Dr. Manga wrote in his letter of support for this medal: "Chris is the most technically and mathematically talented student with whom I have ever worked. He also has broad interests and has demonstrated tremendous intellectual creativity through his interactions with a range of colleagues." This assessment is amply supported by the diversity of subjects on which has already published. At the time he received the Niggli medal he had begun to collaborate with a number of workers on topics far outside the field of magmatic petrology. Christian is currently a postdoctoral researcher at Georgia Tech University (USA) and will be joining the faculty there as an Assistant Professor in 2011. The Niggli Commission unanimously congratulates him on his current accomplishments and on starting a career that does indeed promise a very high level of achievement.

Michael Dungan (University of Geneva)
For the board of the Paul Niggli Foundation

Response

I would like to thank the Niggli Foundation and whoever nominated me for this great honor. During these highly competitive and difficult financial times, we are very fortunate that private foundations such as the Niggli Stiftung and the public support of the Swiss National Fund for science provide a rare supportive environment for young geoscientists.

Research in geosciences is becoming more than ever a collaborative adventure. As such, awards reward not only the recipient but also teachers, collaborators and inspiring

mentors that helped shape the scientific journey of the awardee. In that light, I would like to take this opportunity to thank chronologically the people who influenced my development as a young researcher. I hope that those interested in diffusion processes will appreciate the random walk nature of my path to research in geoscience. I believe that this convoluted journey is a testimony to the various captivating individuals that I interacted with along the way.

Mike Dungan from the department of Earth Science at the University of Geneva was the first to focus my energy on petrology and magmatic processes during my undergraduate studies. At the end of my second year, Mike offered me the opportunity to head to the San Juan Volcanic Field in Colorado for over 2 months of field work with one of his then Ph.D. student, Olivier Bachmann and Peter Lipmann from the USGS. I was then introduced to scientific research for the first time and the company could not have been better. It also started a long and fruitful collaboration and friendship with Olivier Bachmann (a former recipient of the Niggli medal).

After a 3-year-break from geosciences to study physics and acquire the tools necessary to explore the dynamical processes I was curious about, I moved to California and was fortunate to join Michael Manga at Berkeley for my PhD. As my advisor, Michael introduced me to modeling and hypothesis testing. During these years, I had the pleasure to collaborate with Josef Dufek on magma chamber dynamics and eruptive processes. My different collaborators taught me the value of multidisciplinary approaches combining field and petrological observations with geochemical measurements and physical modeling.

One can only marvel at the number of non-linear feedbacks responsible for the eruption of magmas at the Earth's surface. From the partial melting of complex phase assemblages in response to mantle upwelling, the importance of heat transfer and local crustal stress-field on melt transport and storage and finally the importance of crystal-melt-bubble interactions on the eruptability of magmas at shallow depths, the importance of small-scale processes on large-scale dynamics is ubiquitous. Quantifying the role of various parameters on these dynamical processes requires developing new physical and numerical models to be tested against field and analytical observations. This has been difficult and often frustrating and I have been very fortunate to share some of the most difficult adventures with a great collaborator and friend Andrea Parmigiani.

After concentrating mostly on shallow crustal magmatic processes, I decided to move on to what occurs below and above magma chambers. Last year, I moved to the Georgia Institute of Technology for a postdoc under the guidance of Josef Dufek, to study melt generation and transport in the deep crust/upper mantle as well as the importance of gas bubble dynamics on volcanic eruptions.

To conclude, research often leads to a single-minded and delightful compulsive behavior. Unfortunately, someone has to cope with it. I would like to take this opportunity to thank my family for its constant and understanding support and my wife Olga who has heard patiently more often than anybody can suffer words such as lattice Boltzmann, Argon diffusion and crystal mush.

Christian Huber (Georgia Institute of Technology, USA)