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Maria Schönbächler receives the 2007 Paul Niggli Medal

The Board of the Paul Niggli Foundation has decided in their session of 26 June 2007, to award the Paul Niggli Medal to Maria Schönbächler from Einsiedeln (Schwyz). The medal is awarded in recognition of her original research on the earliest history of our solar system and the differentiation of Earth's core and mantle, as deduced from the mineralogy and isotope geochemistry of meteorites and lunar samples, using novel analytical techniques.

Citation

Maria Schönbächler started her academic studies in geology and petrology, after working several years in the postal business while attending evening school in preparation for university. In a minimum of time she graduated at ETH Zürich, with a Diploma (MSc) project on high-pressure metamorphism of ultramafic rocks in the Sierra Nevada (Spain).

Subsequently she started a PhD in cosmochemistry at ETH, leading to a dissertation on the isotope geochemistry of zirconium and niobium in meteorites. The relatively short-lived isotope ^{92}Nb, which decayed to ^{92}Zr within the first few hundred million years of the creation of the solar system, provides a geological clock for the formation of the terrestrial planets. Earlier studies of the Nb-Zr decay system had indicated that large silicate reservoirs on Earth formed more than 50 million years after the oldest meteorites, posing a serious problem for current models for the origin of the solar system. By developing new separation techniques using meteorite material and high-precision isotope analysis by multicollector mass spectrometry, Maria Schönbächler was able to obtain the first accurate reading of this isotopic clock for the early solar system. Her results, which were published in an important *Science* paper in 2002, led to a reconciliation of the ^{92}Nb-^{92}Zr evidence with indications from physical models and other isotope systems, and this showed that Earth formed within a short period of less than 50 Ma after the formation of our solar system.

After her doctoral studies, Maria Schönbächler moved to Washington DC, to take up a postdoctoral research position at the Carnegie Institution where she devoted her research to the development and application of novel analytical methods for other isotope systems. Among several important projects, she used the composition of Ag isotopes to investigate the history of the differentiation of core and mantle in the early Earth, producing the so far most accurate determinations of the silver isotopic composition of meteorites and terrestrial samples. Her data have shown that the Earth contains radiogenic Ag from ^{107}Pd decay, possibly indicating that the Earth's core formed within the first 20 million years of solar system history. Following a second postdoc at Imperial College, where she developed Cd isotope geochemistry to study the early volatile depletion of terrestrial planets, Maria Schönbächler was recently appointed to a faculty position at the University of Manchester.

On the 16. November, her award was celebrated at the 4th Swiss Geoscience Meeting in Geneva. Congratulations, Maria!

Christoph A. Heinrich, ETH Zürich.
President of the Paul Niggli Foundation.

Response

It fills me with great pleasure and gratitude to receive the Paul Niggli Medal. It came out of nowhere to me, and thus was an extremely enjoyable surprise. This is a very stimulating experience that boosts my motivation to continue with my research. When I read through older acknowledgements, I realized that I was not the only medal receiver feeling this way, and I would like to thank the Paul Niggli Stiftung and all the people who nominated me to make such experiences possible.

I would never have come so far without the support of many people: friends, colleagues and mentors, and I would like to take this opportunity to thank them.

My first geological endeavour was probably as a child, at a time when I absolutely wanted to become a farmer. I collected white pebbles. When we went for our first family holiday to the Ticino in the South of Switzerland, I discovered that the white pebbles there were much nicer, with a much clearer white, than those in the region of my home village Willerzell near Einsiedeln. So I collected all white pebbles with passion and kept them carefully at home. Twenty years later, I found them again. And now it was clear to me: I was collecting calcite in my home village while the ones from the South were quartz. I am grateful to my parents that they let me make this experience.

However, for a while, I forgot about collecting pebbles and made an apprenticeship in the Swiss postal service. I enjoyed the work there but after a while I found that I needed a new challenge. So I started evening school, and afterward – probably because I was undecided whether I liked biology, mathematics, chemistry or physics best – I went to study geology at ETH Zürich, which included all of it, and where I could go on field trips in addition.

One of my first lectures at ETH was given by a very enthusiastic and energetic person: Volkmar Trommsdorff (Trommi). He later gave me the opportunity to do my diploma thesis in the Sierra Nevada, Southern Spain, together with Regina Hürlimann. I found and still find the topic of the breakdown of serpentine at high pressures and temperatures very exciting. Moreover, Trommi's commitment and engagement did not leave any space for doubts. I am very grateful for his support and also for the help from people of his group during my Diploma thesis. Andy Stucky, André Puschnig, and Othmar Müntener just to mention a few, they all demonstrated how exciting it can be to work in the area of petrology.

The reason why I did not stay completely true to that field was another fascination, I shared for a long time: the stars and planets. Alex Halliday just arrived as a new professor at ETH, when I was going from door to door at ETH to check out PhD opportunities. He offered me a PhD project on meteorites and the moon. Unravelling the history of bodies we cannot reach (or just barely, such as the moon) and learning about our own history at the same time bears a deep fascination for me. In Alex Halliday I again found a person who is particularly dynamic and enthusiastic about his research. The PhD studies on Zr isotopes in meteorites and the moon turned out to be much more difficult than anticipated, but through the support of Alex Halliday and his group, in particular Mark Rehkämper and Der-Chuen Lee, the project was eventually successful.

After my PhD, I went to the Department of Terrestrial Magnetism of the Carnegie Institution of Washington, DC, to work on the Pd-Ag decay system, with the goal of dating the Earth's core formation. I found a supportive environment that facilitated the development of a significantly improved analytical procedure for this system. Especially, Rick Carlson helped me to fight against the resistances of scientific and other nature, while Tim Mock spent an enormous effort to keep the MC-ICPMS instrument running. This made the success of that project possible.

Then I moved back to Europe, to the UK, working with Mark Rehkämper at Imperial College London. I am grateful for his support and the scientific freedom he granted me. Intending to stay longer at Imperial College, I applied for and received an advanced SNF Fellowship. I would like to thank all people that supported this application. Eventually, I did not use it because I was offered a faculty position in Manchester where I am looking forward to continue my work on the early history of the solar system.

On my way, I have experienced the support of countless people and friends, whom I would like to cordially thank here: Even any tiny support was and is precious, and without you, I would not have come so far. Thank you!

Maria Schönbächler, University of Manchester, United Kingdom.