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Juliana Troch receives the 2022 Paul Niggli Medal

The Paul Niggli Medal is Switzerland's most prestigious award for young earth scientists who made outstanding contributions in the research fields of mineralogy, geochemistry, petrology, resource geology or solid-earth geophysics. The Paul Niggli Medal honours and supports young ambassadors of Swiss geoscience, who are either Swiss citizens or obtained at least two of their academic degrees in the Swiss university system (BSc or MSc and usually their PhD).

The Board of the Paul Niggli Foundation decided, in their session of 2nd June 2022, to award the Paul Niggli Medal for the year 2022 to Juliana Troch, in recognition of her innovative research combining field work, experimental petrology and modelling to understand the evolution of fluids in magmatic systems.

Maria Schönbächler (ETH Zürich)
On behalf of the Foundation Council of the Paul Niggli Stiftung

1 Citation

It is a great pleasure to provide the citation for the awarding of the 2022 Paul Niggli medal for a young, outstanding earth scientist in Switzerland to Prof. Juliana Troch. Juliana started her undergraduate studies at the University of Kiel investigating volcanic deposits in Southern Chile for her bachelor thesis. In 2012, Juliana came to ETH Zürich to continue as a master student in Olivier Bachmann's group constituting part of the nucleus of this new research group in volcanology. She conducted a master thesis with Olivier and Ben Ellis on magma reservoirs connected to the Yellowstone hot spot track. Juliana evidently liked the topic and the environment and continued at ETH with a PhD under the supervision of Oliver, Ben and myself combining geochemistry, volcanology and experimental petrology to unravel the origin and enigma of low $\delta^{18}O$ rhyolitic magmas at Yellowstone and worldwide. After successful completion of the PhD in 2019 that was recognized with the ETH silver medal and resulted in 5 publications, Juliana moved to Brown University in Providence (US) working as a postdoc with Chris Huber. There, she added yet another flavour to her already impressive set of skills and tools she was mastering, namely numerical modelling of igneous processes. In 2020, she continued her postdoctoral research at the Smithsonian Institution, National Museum of Natural History in Washington DC conducting multi-disciplinary research including experimental studies on magmas, melts and fluid controlling ascent and eruption of magmas at the Earth surface and fluid-mediated processes associated with them. In September 2022, Juliana started as tenure-track professor at the RWTH (Rheinisch-Westfälische Technische Hochschule) Aachen in Germany on a chair entitled "Petrology and fluid processes".

The short biography presented above clearly highlights that Juliana is a particularly talented and successful young researcher. Juliana is among the rare species of petrologist / volcanologist who not only masters a large number of different methods and techniques ranging from field studies to petrology and geochemistry to experimental petrology and numerical modelling, but Juliana is a very creative and imaginative scientist who explores new avenues of research to target imminent questions in petrology and volcanology such as the recent topic of late stage magmatic fluids that have direct impact on hydrothermal ore forming processes.

Juliana's main interests are the fundamental understanding of how magmatic systems work in particular how volcanoes form, operate and impact on the surface and the habitability of our planet. She is an excellent teacher able to motivate students through field work and excursions putting the hands on the material the Earth is composed of and leading them through careful analysis and experiments to interpret the rock record and derive the fundamental processes, rates and time scales that control igneous and hydrothermal material cycles in the interior and the surface of the planet.

As a former mentor, active collaborator and friend, I would like to congratulate Juliana Troch for the very well-deserved 2022 Paul Niggli medal and wish her all the best for a successful and most satisfying academic and non-academic career and future!

Peter Ulmer (ETH Zürich)

2 Response

I am deeply honoured to receive the 2022 Paul Niggli medal. I would like to thank the board members of the Paul Niggli foundation for their consideration and my mentors and colleagues for nominating me for this award. This recognition means a lot to me—even though I am not Swiss and am just starting my next career step on what is (from a Swiss perspective) clearly the wrong side of the Rhine river, my time here has left me with deep ties. Switzerland and Zurich feel like my scientific home base, making this award extra special.

I am so grateful to all those who supported, advised and mentored me over the last decade and inspired me to pursue this career further, particularly Olivier Bachmann, Peter Ulmer, Ben Ellis at ETH, Chris Huber during my postdoc at Brown University and Mike Ackerson during my postdoc at the Smithsonian National Museum of Natural History.

I am very grateful to Olivier and Chris for their support, trust and for countless inspiring discussions on all aspects of crystal mush. I am particularly grateful for their support during the pandemic, which often included daily zoom calls and modelling exercises with Chris and multiple research visits with Olivier at ETH when the labs in the US were still closed due to Covid. Their enthusiasm and energy are truly inspiring and I have learned so much from both of them about putting my research in a wider and more multidisciplinary context.

I am indebted to Ben, who involved me in his Yellowstone and Snake River Plain research early on. So many amazing opportunities arose thanks to his continuous encouragement and strategic planning, such as fieldwork in Idaho, Iceland and the Canary Islands. I have particularly fond memories of our fieldwork in Idaho, from rock-hunting in bear country, to watching a solar eclipse, to discussing projects and sipping a beer while sitting in a hot spring after a long day of ignimbrite sampling in gruelling 35 °C heat.

I am very grateful to "Pulmi" for the beautiful laudatio, but also for his always open door over the years, for sharing his encyclopaedic knowledge of petrology and fascination for phase diagrams, and for generously letting me run experiments even when I was no longer officially at ETHZ.

I would also like to thank long-time collaborator Chris Harris for his continuing support and hosting me in South Africa, as well as Steffen Kutterolf, Armin Freundt, Marc Reichow, and Mike Branney for accompanying my first research experiences as a BSc student in Kiel and during a research internship at the University of Leicester.

For people growing up close to the Alps, it can sometimes be difficult to imagine or understand how someone gets into geology after growing up in an area without any mountains. I grew up in northern Germany close to the Baltic Sea where the highest mountain measures an astounding 167 m above sea level, coining the area's name Holstein Switzerland. It is basically composed of old moraines, meaning you find half of the Scandinavian rock record assembled along the beaches in beautiful boulders and pebbles. Frankly, this can actually make for at least equally if not more inspiring mineralogy than some outcrops in the Alpine foreland! This is where my earth science studies began at the University of Kiel and it also where I met the person without whom I would definitely not be where I am today, and who is mineral expert, love of my life and now husband Nico. We are the living proof that the pickup line "Do you want to see my rock collection?" does actually work.

Over the last years, we have moved around quite a bit, from Kiel to Zurich, then to the US East coast and now back to Europe. I am so grateful for the great colleagues we met along the way, many of whom became some of our best friends. When you work with people you like, work is a source of joy, even if your experiment just failed or reviewer 2 just rejected your manuscript. Sometimes they are not even your own, direct colleagues, as I was also adopted as a postdoc by the Carnegie Institution of Science during our time in Washington DC. It was only recently that I learned that Paul Niggli, very unusual for his time, also spent some time as a postdoc at Carnegie, and it has been inspiring to explore some of his early works on pegmatites.

Obviously, many more people and friends supported and helped me throughout the years and I would like to acknowledge them all here. A special thank you goes to my family for their unconditional support on this journey. I am looking forward to the next exciting research projects and hope that I will be able to share and pass on

some of the joy that I experienced during my work here in Switzerland and elsewhere with my colleagues and future students in my new group at RWTH Aachen.

Juliana Troch (RWTH Aachen)

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