

LAUDATIO

Open Access

Christian Renggli receives the 2023 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 annual meeting of 19 June 2023, to award the Paul Niggli Medal for the year 2023 to Christian Renggli, in recognition of his outstanding research using experimental methods to understand the properties of gas-solid reactions in volcanic systems on Earth, the Moon and Mercury.

Maria Schönbächler (ETH Zürich).

On behalf of the Foundation Council of the Paul Niggli Stiftung.

1 Citation

It is with great pleasure that I provide this citation, together with Prof. Penny King from the Australian National University. This award recognises Christian's wide-ranging and influential contributions to the development and application of experimental and theoretical methods to study the mobility and fractionation of volatile elements in gases and low-density fluids.

Christian J. Renggli studied geology at the University of Bern and did his Masters thesis in petrology and geochemistry at the Ludwig-Maximilian University in Munich, using experiments to study magma mixing processes. He then moved down-under and began a PhD project at the Australian National University, supervised by Penny King. His research combined results from natural samples with experimental and theoretical methods, studying reactions between gases and rocks. He applied these studies to Apollo samples returned from the Moon, the Earth, and the terrestrial planets.

Perhaps it is now time to create a link to Paul Niggli, who became famous for using thermodynamic principles to address petrological and geochemical problems. Niggli published numerous influential publications and his early book "Die leichtflüchtigen Bestandteile im Magma" argues that volatile elements in magmatic and other rocks must be regarded as separate phases that affect phase relations and mineral stabilities. He was one of the first to employ both early experimental constraints and thermodynamic principles to investigate geological processes. Chris Renggli, following Niggli's footsteps, also conducts experiments, together with thermodynamic modelling and field constraints.

After completing his PhD, Chris moved to the University of Münster in 2018, initially with a postdoctoral fellowship from the Swiss National Science Foundation, and soon after he received a grant from DFG, the German Research Foundation. This research project revolved around the behaviour of sulfur during gas-solid interactions with a focus on explaining phenomena on Mercury, the Moon, and other terrestrial planets. Chris relates his

experimental and theoretical approaches directly to planetary materials and space missions, such as the Apollo mission mentioned earlier and the BepiColombo mission to Mercury. He is also involved in studies concerned with the fractionation of so-called “non-traditional isotopes” during evaporation. I am sure, that much of this research will lead the way into a more thorough understanding of how evaporation, gas transport, and condensation affect volatile element cycles in magmatic and hydrothermal systems on the Earth and the other rocky planets.

Last, but not least, Chris is an excellent communicator of all things Earth science, he motivated undergrad students through assisting in laboratory exercises and undertaking field work on volcanic islands. He co-mentored several Masters and PhD students at ANU, in Münster, and elsewhere. It has always been a pleasure to discuss petrological and geochemical problems with him.

As mentors, active collaborators and friends, Penny King and I would like to congratulate Christian Renggli for the very well-deserved 2023 Niggli medal and we wish him all the best for a successful academic career.

Stephan Klemme (Universität Münster).

2 Response

I am honoured and humbled to receive the 2023 Paul Niggli medal, and I extend my sincere gratitude to Stephan Klemme and Penny King for the generous Citation.

Twelve years ago, I left Switzerland on my path to become a planetary scientist. After more than a decade abroad my connection to Switzerland remains strong. This recognition means a lot to me and I hope that it will strengthen this connection. I thank the Paul Niggli Foundation for their support. It is a great honour to be among such a distinguished list of individuals who previously received this medal.

The path I followed over the past years was in no way planned. Instead, I followed my nose and got lucky! I got lucky with the opportunities that I found, and the many people that I met, who supported me in advancing my skills, broadening my knowledge, and then taking the next step. I never planned to become a planetary scientist, but always tried to pursue my interests. It is a great privilege to have had this opportunity and I am indebted to my family for their support and understanding for my choice of life path.

At the Ludwig-Maximilian University in Munich I studied volcanology and discovered the excitement of high temperature laboratory experiments. I thank Cristina De Campos, Kai Hess, Sebastian Wiesmaier, and

Don Dingwell for showing me the ropes. All I added to the high temperature experiments since then were corrosive gases and toxic metals.

Moving to the Research School of Earth Sciences at the Australian National University for a PhD was an adventure. It was an exciting environment for a young scientist with a great community of PhD students across all the disciplines of the Earth Sciences, and from all the corners of the world. We shared many adventures from the many national parks around Canberra to the remote outback in the heart of Australia. Many of my fellow students have become good friends and tremendously enriched the experience for me.

I was incredibly lucky to have found in Penny King a fantastic supervisor and mentor. We had only met once over Skype before I booked the one-way flight to Australia, but my intuition was right. I am also thankful to Dick Henley from whom I learned so much. In my PhD, I had the chance to work on fundamental processes that appeared to be a niche subject in the Earth and Planetary Sciences. But it turns out that high-temperature gas-solid reactions are omnipresent from volcanic processes on Earth, to weathering on Venus, the sulfur cycle on the Moon or Mercury, and throughout the evolution of the solar system. I thrive to explore these environments and processes experimentally and contribute to our understanding of how planets form and evolve.

The Early Postdoc.Mobility Fellowship from the Swiss National Science Foundation gave me the time and resources to become a more independent researcher and provided me with a path to return to Europe. As much as I enjoyed living in Australia, it is very far away from home and family. The Fellowship also provided me with the experience of following up with an independent DFG research grant on “gas-solid reactions in hot, reduced planetary environments”.

Over more than five years at the University of Münster I’ve had the great pleasure to work with Stephan Klemme. He is a mentor and has become a friend. I am thankful for his unequivocal support in my research endeavours. Münster was a fruitful place for many collaborations. Notably, I was privileged to be involved in the collaborative research centre TRR170 “late accretion onto terrestrial planets”, which involves a network of planetary science institutions in Berlin, Münster and Göttingen. Collaborations with the group of Harry Hiesinger further gave me the chance to become involved in an ongoing planetary science mission, the ESA/JAXA BepiColombo probe on the way to Mercury.

Since October this year, I am now at the Max Planck Institute for Solar System Research in Göttingen under the leadership of Thorsten Kleine. It is at the same time a strange experience to be one of very few geoscientists among mostly astrophysicists and engineers, but it's also exhilarating to build an experimental lab that is dedicated to provide links to ongoing and future space missions. I am excited to see what the future brings and thank you all once again from the bottom of my heart.

Christian Renggli (Max-Planck Institute for Solar System Research, Göttingen).

Published online: 29 January 2024

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.