Meet the Authors

Sarah Aarons is an isotope geochemist whose research spans both low- and high-temperature geochemistry. She applies radiogenic and non-traditional stable isotopes to understand the interplay between Earth's surface and its evolution through geologic history, including measurements of ancient rocks and modern river sediments, ice cores, and dust. She is an assistant professor at Scripps Institution of Oceanography at the University of California, San Diego (USA). She was previously a Ford Foundation Postdoctoral Fellow at the University of Chicago (Illinois, USA) and a University of California Chancellor's ADVANCE Postdoctoral Fellow at the University of California, Irvine (USA). She completed her PhD at the University of Michigan (USA) in 2016.

Michael A. Antonelli is an isotope geochemist and postdoctoral fellow in the Department of Earth Sciences at ETH Zürich (Switzerland). After completing his master's degree in 2013 at the University of Maryland, College Park (USA), and his PhD studies in 2018 at the University of California, Berkeley (USA), he spent one year as a postdoctoral researcher at the Institut de Physique du Globe de Paris (France) before moving to ETH Zürich. He uses stable and radiogenic isotope variations to understand a wide variety of topics: igneous and metamorphic petrology, marine geochemistry, Solar System evolution, and biological and ecological processes. His major focus has been on the development and application of Ca isotopes to high-temperature systems, where isotopic variations are due to radiogenic, equilibrium, reactive-kinetic, and diffusive-kinetic effects, all of which can yield important constraints on the ages, rates, timescales, mechanisms, and sources of rock and mineral formation throughout Earth history.

Christoph Burkhardt is a geo-/cosmochemist at the Institut für Planetologie, University of Münster (Germany). He uses variations in the abundance of isotopes in terrestrial and extraterrestrial materials in combination with mineralogy and geology to investigate the processes and timescales of the formation and evolution of matter – from the synthesis of the elements in stars, through to the accretion of planets and their differentiation into core, mantle, and crust, to the weathering of minerals at the Earth's surface. He obtained diplomas in geology and mineralogy at the University of Cologne (Germany) and a PhD at the ETH Zürich (Switzerland). After postdocs at the ETH Zürich, the University of Chicago (Illinois, USA), and the University of Münster, he currently holds a research associate position.

Mauricio Ibañez-Mejia is an assistant professor in the Department of Geosciences at the University of Arizona (USA), which he joined in 2021 after completing his PhD also at the University of Arizona (2014), a W. O. Crosby Postdoctoral Fellowship at the Massachusetts Institute of Technology (USA) (2014–2016), and a four-year appointment as an assistant professor at the University of Rochester (USA) (2016–2020). He is a geochemist who combines the use of geochronology with other isotopic tracers (radiogenic and stable) in rocks and minerals to better understand petrologic and lithospheric processes in a robust temporal framework. Since 2021, he has served as a co-director of the Arizona LaserChron Center.

Aleisha C. Johnson is an NSF–EAR Postdoctoral Fellow at the University of Chicago (Illinois, USA), where she specializes in the measurement and interpretation of titanium and iron stable isotopes in igneous systems. In 2020, she completed her PhD in geological sciences from Arizona State University (USA), during which she employed experimental, isotopic, and modeling approaches to quantify molybdenum cycling at Earth's surface during the initial rise of oxygen in Earth's atmosphere. She uses non-traditional stable isotopes to learn more about the formation of Earth's continental crust, the evolution of Earth's atmosphere, and how these processes led to Earth's persistent habitability.

Shelby Rader is a trace-metal geochemist who specializes in non-traditional stable isotopes. She works at a range of scales (from regional to mineralogical) to better understand metal mobility and fractionation across the bio-, hydro-, and geospheres. Her work focuses on how geochemical changes can inform our understanding of large-scale Earth processes, such as ore deposition, environmental remediation, and fluid fluxing. She is currently an assistant research scientist at Indiana University Bloomington (Indiana, USA) where she will begin as an assistant professor in January 2022. She previously held a postdoctoral position at the University of Massachusetts, Lowell (USA) and completed her PhD at the University of Arizona (USA) in 2018.

Anat Shahar is a geochemist interested in the formation, differentiation, and evolution of planetary bodies. Her research blends experiments at high pressures and temperatures with isotope geochemistry in order to understand the mechanisms responsible for stable isotope fractionation while simulating the conditions of planetary interiors. After completing her PhD in 2008 at the University of California, Los Angeles (USA), she moved to the Carnegie Institution for Science (Washington DC, USA) first as a postdoctoral fellow and now as a staff scientist.

Paolo Sossi is an SNSF Ambizione Fellow at ETH Zürich (Switzerland), a position he has held since 2019, prior to which he was a European Research Council postdoctoral fellow at the Institut de Physique du Globe de Paris (France), following completion of his PhD in 2015 at the Australian National University. His interests lie in unravelling the high-temperature properties of melts, minerals, and vapors via spectroscopy, mass spectrometry, and experimental petrology to understand the structure, chemistry, and evolution of rocky planets from their accretion to the present day.

Haolan Tang is an associate project scientist in the Department of Earth, Planetary, and Space Sciences at the University of California, Los Angeles (USA). Having earned her PhD in cosmochemistry at the University of Chicago (Illinois, USA) in 2013, she first worked at University of California, Los Angeles as a postdoctoral researcher before serving as a project scientist from 2018. Her research interests are primarily chemical and isotopic evolution during planetary formation and the evolution of the early Solar System. The goal of her research is to better understand the mechanisms of planetary evaporation through evaporation experiments and theoretical simulations. She is also focusing on high-precision isotope analyses of asteroid samples to trace the origins of pristine meteorites.

François L. H. Tissot is an assistant professor of geochemistry and a Heritage Medical Research Institute investigator at the California Institute of Technology (USA). His research spans both geochemical and cosmochemical problems, and currently focusses on (i) unraveling the evolution of the Solar System through the isotopic characterization of meteorites and their inclusions, (ii) reconstructing the paleo-redox conditions in the ocean/atmosphere system, and (iii) assessing the potential of non-traditional stable isotopes for studying magmatic processes. Trained as an engineer in geology at the ENSG (France), he received a PhD (2015) from the University of Chicago (USA) and was the W. O. Crosby Postdoctoral Fellow at the Massachusetts Institute of Technology (USA) from 2016 to 2017. In 2018, he joined the faculty at the California Institute of Technology (USA), where he created the Isotoparium: a state-of-the-art facility for high-precision isotope studies.

James W. Watkins is an experimentalist who develops tools for interpreting geochemical variations in the rock record. Much of his work involves growing crystals from magmas, from hydrothermal fluids, and from aqueous solutions in the laboratory and developing mathematical models of crystal growth that include trace element and isotope effects. He is currently an associate professor at the University of Oregon (USA).

Edward Young is professor of geochemistry and cosmochemistry at the University of California, Los Angeles (USA). He works on problems related to the origin and evolution of planets using a variety of methods, including measurements of isotope ratios in meteorites, the abundances of rocky materials in the atmospheres of white dwarf stars, and telescopic observations of isotopologues in molecular clouds. His work also includes studies of various geochemical systems here on Earth, including, most recently, the origins of methane gases and the use of rare isotopologues of nitrogen as tracers of volatile cycling on Earth.