

Joint winner of the 2022 IAG Young Scientist Award

Ery Hughes



Ery is a volcanic fluid geochemist in the Volcanology Team at Te Pū Ao | GNS Science, Aotearoa New Zealand. She is interested in the behaviour of volatiles in magmatic systems and particularly stable isotope fractionation during degassing. She completed her PhD at the University of Bristol in 2019, where she developed novel microanalytical techniques to analyse melt inclusions (tiny pockets of melt, trapped inside crystals as they grow in magma reservoirs) to unravel the histories of magmas prior to eruption at Etna (Italy) and Ōkāina (Aotearoa New

Zealand). Using the electron microprobe, she developed high-spatial resolution techniques to determine the oxidation state of iron and “water-by-difference” in silicate glass, providing more accessible techniques for such measurements. This involved understanding the mechanisms of how silicate glass is altered during analysis with the electron probe (and other microbeam) techniques to ensure accurate results. For instance, charging from electron implantation into the glass can cause both oxidation and reduction of multivalent elements, as well as decelerating incoming electrons and thus reducing their ability to generate X-rays. She also created silicate glass standards for carbon isotope analysis and continues to develop the methodology for determining carbon isotope ratios in melt inclusions using the ion probe. When not in the lab, Ery enjoys cycling, rock climbing and skiing.

1. Hughes et al. (2018). *High spatial resolution analysis of the iron oxidation state in silicate glasses using the electron probe. American Mineralogist*, **103** (9), 1473-1486.
2. Hughes et al. (2019). *Low analytical totals in EPMA of hydrous silicate glass due to sub-surface charging: Obtaining accurate volatiles by difference. Chemical Geology*, **505**, 48-56.