

"Two Miles Underwater: A Voyage to the Bottom of the Sea"

Two miles below the ocean surface, deep-sea hydrothermal vents are home to a community of extraordinary animals. In an environment without light, under intense pressure and volcanic heat, many gastropods and bivalves living directly on the vent chimneys show adaptations that have driven important scientific breakthroughs. For example, the famous “scaly-foot” gastropod, *Chrysomallon squamiferum*, has hard scales on its foot with a crystalline iron coating that has inspired novel defensive armor designs. This iconic species has only been reported from three sites in the Indian Ocean, each site hundreds of miles apart and only around half the size of a football field. Two of these three sites are already designated under international exploration licenses for deep-sea mining, to extract rare minerals from the vent chimneys.

Images of dense biomass can be misleading, as the surrounding context of empty ocean is never visible. Discovery of new vent fields is guided by searches for temperature anomalies and chemical signals higher in the water column, a search for a needle in an ocean haystack. Many iconic vent sites are actually tiny; the Kairei field on the Central Indian Ridge, where the scaly-foot gastropod was first discovered, is less than half the size of a football field.

This talk will give an account of a recent exploring expedition to the central Indian Ocean with the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) in February 2016, and the mapping of newly discovered sites of hydrothermal activity.

Biography

Dr Julia Sigwart is an evolutionary biologist, who studies the diversification of mollusks and other marine invertebrates. She is an associate professor at Queen’s University Belfast in Northern Ireland and the Associate Director of Queen’s University Marine Laboratory, an interdisciplinary off-campus research institute. She is presently based in the University of California, Berkeley, at the UC Museum of Paleontology, on a sabbatical funded by a research excellence award from the European Commission. One aspect of her research focuses on the specialist adaptations that enable molluscs to exploit extreme environments, and adapt to environmental change. Using an integrative approach, Dr Sigwart’s research group investigates the diversity and diversification of species, in present environments and the fossil record.

<http://www.qub.ac.uk/qml/People/Sigwart>