

# V14A-01: Temporal and geochemical evolution of the Afanasy Nikitin - 85° E Ridge, Central Indian Ocean, R/V SONNE cruise SO258/1

**Monday, 10 December 2018**

**16:00 - 16:15**

📍 *Marriott Marquis - Liberty I-K*

The Afanasy Nikitin Ridge forms the central portion of the so-called 85°E Ridge in the Indian Ocean. This N-S trending structure runs parallel to the nearby Ninetyeast Ridge and comprises: 1) The Buried Hills (3°-5°N), 2) Afanasy Nikitin Ridge (2°-6°S) and 3) the "Southern Seamounts" (6°-11°S). The few samples previously available from the Afanasy Nikitin Ridge reveal the strongest Enriched Mantle I-type geochemical signature reported thus far in oceanic basalts (Mahoney et al., 1996, *Geology* 24; Borisova et al., 2001, *J. Petrol.* 42) and indicate a complex magmatic evolution with at least two magmatic stages (at ~75 and ~67 Ma; Krishna et al., 2014, *J Earth Sys. Sci.* 123). Overall, the origin of the ~1500 km long and discontinuous 85° E Ridge is controversial and could either be related to a mantle plume (e.g.; Crozet; Mahoney et al., 1996, *Geology* 24) or shallow processes (e.g. faulting of the ocean crust; Kent et al., 1992, *Geology* 20). Currently, it is even unclear if the Afanasy Nikitin Ridge is genetically linked to the previously unsampled Buried Hills and Southern Seamounts or a re-activated portion of the 85°E Ridge (Krishna et al., 2014, *J Earth Sys. Sci.* 123). New major and trace element data have been generated from magmatic rocks dredged during SO258/1 INGON at 28 sites dispersed along the entire 85°E Ridge. Our new results show that the various units along the 85°E Ridge are characterized by high Ba/Rb, Ba/Nb, La/Nb and low (Ce, Nd)/Pb ratios indicating a common source with a contribution of lower continental crust or subcontinental lithospheric mantle. These trace element signatures are distinct from the nearby Ninetyeast Ridge or Crozet hotspot lavas, which may exclude a direct relation to one of these hotspots. We also will present new Sr-Nd-Pb-Hf-Os isotope and age data, which will provide further insights into the origin of the enigmatic 85°E Ridge.

## Authors

### Stephan Homrighausen

*GEOMAR Helmholtz Centre  
for Ocean Research Kiel*

### Kaj Hoernle

*GEOMAR Helmholtz Centre  
for Ocean Research Kiel*

### Joerg Geldmacher

*GEOMAR Helmholtz Centre  
for Ocean Research Kiel*

### Folkmar Hauff

*GEOMAR Helmholtz Centre  
for Ocean Research Kiel*

### Maxim Portnyagin

*GEOMAR Helmholtz Centre  
for Ocean Research Kiel*

### Reinhard Werner

*GEOMAR Helmholtz Centre  
for Ocean Research Kiel*

### Bruce F Schaefer

*Macquarie University*

### Jo-Anne Wartho

*GEOMAR Helmholtz Centre  
for Ocean Research Kiel*

### Dieter Garbe-Schönberg

*Institute of Geosciences*

[Find Similar](#)

## View Related Events

**Day:** [Monday, 10 December 2018](#)