



# ISAES 2019

XIII International Symposium on Antarctic Earth Sciences

22 July (Mon) – 26 July (Fri) , 2019  
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**PROGRAM BOOK**



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## Parallel Session (Wed)

- 7:00 **A420** Testing the Hotspot Hypothesis for Marie Byrd Land, West Antarctica Using Ice Penetrating Radar  
*Enrica Quartini* University of Texas Institute for Geophysics, USA
- 7:15 **A413** Prominent Mantle Transition Zone Thinning Beneath the Central Transantarctic Mountains  
*Erica Emry* New Mexico Tech, USA
- 7:30 **A265** Estimating Geothermal Heat Flux from Ice Sheet Borehole Temperature Measurements  
*Robert Mulvaney* British Antarctic Survey, United Kingdom

## (Wed), 15:00-17:30

Room #305

**2** Emerging Frontiers in Satellite Remote Sensing and Geoinformation in Antarctic Earth Sciences: Cross-Disciplinary Advances  
Convener: Peter Fretwell, Shridhar Jawak, Peter Convey, Simon Cox, Paul Morin

- 15:30 **A215** Bedmachine Antarctica V1: A New Subglacial Bed Topography and Ocean Bathymetry Dataset of Antarctica  
*Mathieu Morlighem* University of California Irvine, USA  
*ynote*
- 16:00 **A252** Release of the Continent-wide Dataset GeoMAP V.201907  
*Simon Cox* GNS Science, New Zealand  
*ynote*
- 0-16:30 **A339** Mass Balance of Antarctic Ice Sheet Based on Cryosat-2 from 2011-2018  
*Chang-qing Ke* Nanjing University, China  
*ynote*
- 0-16:45 **A293** Change Detection Over the Major Ice Shelves of Antarctica Using Radarsat and Sentinel Data  
*Esha Shah* Gujarat University, India
- 5-17:00 **A137** Observing the Cryosphere with Next Generation Gns-Reflectometry  
*Brandi Downs* The Ohio State University, USA
- 10-17:15 **A023** Mapping Poorly Exposed Lithologies Using Landsat-8 and Aster Satellite Data in Antarctic Peninsula  
*Amin Beiranvand Pour* Korea Polar Research Institute, Korea
- 15-17:30 **A360** High-resolution Remote Sensing Techniques for Monitoring Penguin Colonies in the Ross Sea, Antarctica  
*Changuk Hyun* Korea Polar Research Institute, Korea

## Parallel Session (Thu)

July 25 (Thu), 10:30-12:30

2F, Grand Ballroom A

**S14-I** Marine Sedimentary Records of Antarctic Ice-Sheet Dynamics and Southern Ocean History during the Late Cainozoic

Convener: Claus-Dieter Hillenbrand, Jaeil Lee, Gerhard Kuhn

- 10:30-11:00 **A148** Early Resumption of Dense Shelf Water Production during the Past Deglaciations  
*Taryn Noble* University of Tasmania, Australia  
*\*Keynote*
- 11:00-11:15 **A190** Late Quaternary Carbonate Dissolution Cycle Recorded in Southern Drake Passage Sediments  
*Jaeil Lee* Korea Polar Research Institute, Korea
- 11:15-11:30 **A061** Post-breakup Deposition Off Prydz Bay (East Antarctica) with Focus on Cenozoic Environments  
*German Leitchenkov* Research Institute for Geology and Mineral Resources of the World Ocean, Russia
- 11:30-11:45 **A209** Continuous Late Miocene to Present Records on West Antarctic Ice Sheet Dynamics: Summary of IODP Expedition 379 to the Amundsen Sea  
*Karsten Gohl* Alfred Wegener Institute for Polar and Marine Research, Germany
- 11:45-12:00 **A193** Iceberg Alley and South Falkland Slope Ice and Ocean Dynamics  
*Yasmina M Martos* NASA Goddard Space Flight Center/University of Maryland, USA
- 12:00-12:30 **A213** Paleoclimatographic Changes in the Southern Ocean Off Elephant Island Since the Last Glacial Maximum  
*Sunghan Kim* Korea Polar Research Institute, Korea  
*\*Keynote*

July 25 (Thu), 10:30-12:30

Room #302

**S02-III** Structure, Evolution, and Heterogeneity of Antarctica's Continental Lithosphere

Convener: J. Jacobs, F. Ferraccioli, Andreas Laeuffer, N. Pant, E. Emry, S. Hansen

- 10:30-11:00 **A394** Achievements and Aspirations of AWI Airborne Geophysics in Antarctica  
*Graeme Eagles* Alfred Wegener Institute, Germany  
*\*Keynote*
- 11:00-11:15 **A347** Lithospheric Magnetic Anomaly Modelling from Antarctic Near-surface and Satellite Observations  
*Hyungrae Kim* Kongju National University, Korea
- 11:15-11:30 **A116** Crustal Evolution of the Archean Napier Complex  
*Simon Wilde* Curtin University, Australia
- 11:30-11:45 **A049** The Early Mesoproterozoic Filla Series in the Rauer Islands: A Possible Fragment of the Long-lived Fraser-Fisher-Ongole Oceanic Realm  
*Evgenii Mikhalskii* VNIIOkeangeologia, Russia

## **Paleoceanographic changes in the Southern Ocean off Elephant Island since the Last Glacial Maximum**

Sunghan Kim<sup>a,\*</sup>, Kyu-Cheul Yoo<sup>a</sup>, Jae Il Lee<sup>a</sup>, Young-Suk Bak<sup>b</sup>, Min Kyung Lee<sup>a</sup>, Ho Il Yoon<sup>a</sup>

<sup>a</sup>Division of Polar Paleoenvironment, Korea Polar Research Institute, Incheon 21990, South Korea

<sup>b</sup>Chonbuk National University, Jeonju 54896, South Korea

Three sediment cores were collected from the Southern Ocean off Elephant Island by R/V *Yuzhmorgeologiya* during 2003/2004 Korea Antarctic Research Program. The core site is ideal for reconstructing paleoceanographic changes in response to glacial retreat since the last glacial period because of its location. In order to reveal how the oceanographic changes are associated with ice sheet/sea ice changes since the last glacial period, we measured geochemical proxies, bulk nitrogen isotope, physical properties, and sediment grain size from all cores. Surface water productivity was dominated by diatom production. Surface water productivity was low during the last glacial period under extensive sea ice conditions and became high during the interglacial period under more open ocean conditions. Apparently, surface water productivity seems to be controlled by sea ice concentration. However, bulk nitrogen isotope, nutrient utilization proxy, showed decreased nutrient utilization with increased surface water productivity and increased utilization with decreased surface water productivity, indicating that surface water productivity in the core site is controlled by nutrient availability in association with changes in sea ice extent. Our result indicates that the surface current system, Antarctic Circumpolar Current, is closely related to changes in cryosphere and oceanographic condition. In addition, our result showed surface water productivity decrease during mid to late Holocene with decreasing nutrient utilization, suggesting deepening of mixed layer depth with intensifying surface current. At the same time, sortable silt also supported stronger bottom current intensity. During this time period atmospheric pCO<sub>2</sub> in the Antarctic ice core was also increasing. This suggests the strong coupling of cryosphere-ocean-atmosphere in the Southern Ocean off Elephant Island.