CHINARE 11 plan
__ Xuelong 2 Arctic cruise

Jianfeng HE
Polar Research Institute of China
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CHINARE 10 in 2019
1. CHINARE 10

✓ Aug.10~Sept.27 2019

✓ 13 Institutes  44 Scientists+ 34 Crews
2. Stations

58 CTD stations
5. Physical Oceanography

(1) CTD/LADCP/SVP: 6 Transects, 58 Stations.
5. Physical Oceanography

(2) Mooring systems

Chukchi Sea: 1 set
Bering Sea: 1 set
5. Physical Oceanography

(3) XCTD 18, XBT 36, Argos 3
6. Chemical Oceanography

(1) Sea water sampling: 50 stations (nutrients, DIC, DOC, POC, DMS)
6. Chemical Oceanography

(2) Sediment sampling: 27 stations
6. Chemical Oceanography

(3) Aerosol sampling: 14
6. Chemical Oceanography

(4) Microplastic:

Sea water (surface): 67

Sea water (stations): 30

Net trawl: 11

Sediment: 26
6. Chemical Oceanography

(5) Organic pollutant sampling:
POP water samples: 13 stations
POP sediment samples: 17 stations
CFCs/SF$_6$ water samples: 25 stations
7. Biological Oceanography

(1) Vertical trawl:
Phytoplankton: 18
Zooplankton: 18
6. Biological Oceanography

(2) Benthic sampling:

26 stations
7. Biological Oceanography

(3) Microzooplankton
sampling: 44 stations
7. Biological Oceanography

(4) Chlorophyll: 248 samples
7. Biological Oceanography

(5) Microbial biodiversity: 40 stations
8. Marine geology

Sediment sampling: 29 stations
CHINARE 11 in 2020
CHINARE 11 Legs:

✓ Leg 1: 1\textsuperscript{st} July __ 27\textsuperscript{th} July

   Shanghai-Northeast Passage-Tromsø

✓ Leg 2: 30\textsuperscript{th} July __ 21\textsuperscript{st} Aug.

   Tromsø-ice station(MOSAiC)-Kirkenes

✓ Leg 3: 23\textsuperscript{rd} Aug. __ 30\textsuperscript{th} Sept. (opening cruise)

   Kirkenes-Central AO-Shanghai
Main tasks:

✓ To support MOSAiC

✓ To Carry out Gakkel 2020 project (opening cruise)/

   To support SAS
The morphology, lithospheric structure, composition, tectonic behaviors, and hydrothermal activities are unique at the ultraslow spreading Gakkel Ridge.
Gakkel 2020 project!

Leg 3 of the 11th Chinese Arctic expedition
23 Aug.----30 Sep., 2020
Kirkenes----Shanghai

Geophysics survey; Hydrothermal exploration; Geological sampling, and CTD
Scientific objective 1: Define the “Hess” crust

Penrose model: Geology; Petrology; Seismic wave; Density; Magnetization

“The oceanic crust seemed to be dramatically thinner than along the rest of the global midocean ridge system. The crust was so thin, in fact, that the very concept of a “crust” had to be called into question.” (Snow and Edmonds, 2007)

“Hess crust”: what is the extent and volume of serpentinitized peridotites? what is the configuration of melts and serpentinitized peridotites? how the melts transported along axis?
Objective 2: To test the seafloor massive sulfide (SMS) deposit prediction model

To date, only one seafloor massive sulfide (SMS) deposit (Aurora) and a number of hydrothermal plume sites were discovered on axial neovolcanic highs along the 2000 km long Gakkel Ridge (Edmond et al., 2003; Baker et al., 2004; Stranne et al., 2010).

Are AVR-related SMS deposits along the Gakkel Ridge larger and Cu-Au-rich?

What’s the linkage between SMS deposits and “thin” ocean crust?
Brief survey plan

150 km profile, 22 OBSs, profile across axis?
2 rock dredges; 2 TVGs, 1 GPC, 4 CTD

Another 6 gravity cores and CTD stations on the way across the Arctic
~10 CTD stations along the track (support the SAS)
Moon pool
Thanks!