

UiT

THE ARCTIC  
UNIVERSITY  
OF NORWAY

# Arctic Field Summer Schools: training the next generation of Arctic researchers

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## The Field School Project

The Arctic Field Summer Schools project is funded by the **Research Council of Norway (NFR)** and **Norwegian Centre for International Cooperation in Education (SIU)**, under the grant agreement number 261786/H30.

The project supports research and education collaboration among UiT - The Arctic University of Norway, University of Alaska Fairbanks (UAF), USA and University of Calgary (UC), Canada.

Through a series of three summer schools, the project will engage graduate students in exploring science questions related to current Arctic challenges, and bring together leading Arctic researchers from the partner institutions.

The project aims to create a forum and learning environment for students and young researchers to obtain an understanding of the complex Arctic environment, and how it can be monitored with various remote sensing sensors and platforms as well as in-situ observations.

## 2017 Norwegian Field School

**1 week field cruise to the marginal ice zone, NW Svalbard, on board R/V Lance**

- May 2017, 15 Students and 12 Arctic researchers
- Ocean, snow and ice measurements (student participation / training)
- UAV/drone optical and radar imagery (demonstrated planning and processing)
- Satellite PolSAR imagery acquired (co-located with field data)

**1 week remote sensing workshop at CIRFA/UiT - The Arctic University of Norway, in Tromsø**

- Lectures on Arctic science and remote sensing topics
- Analysis of collected data and satellite images
- Plan and present student projects

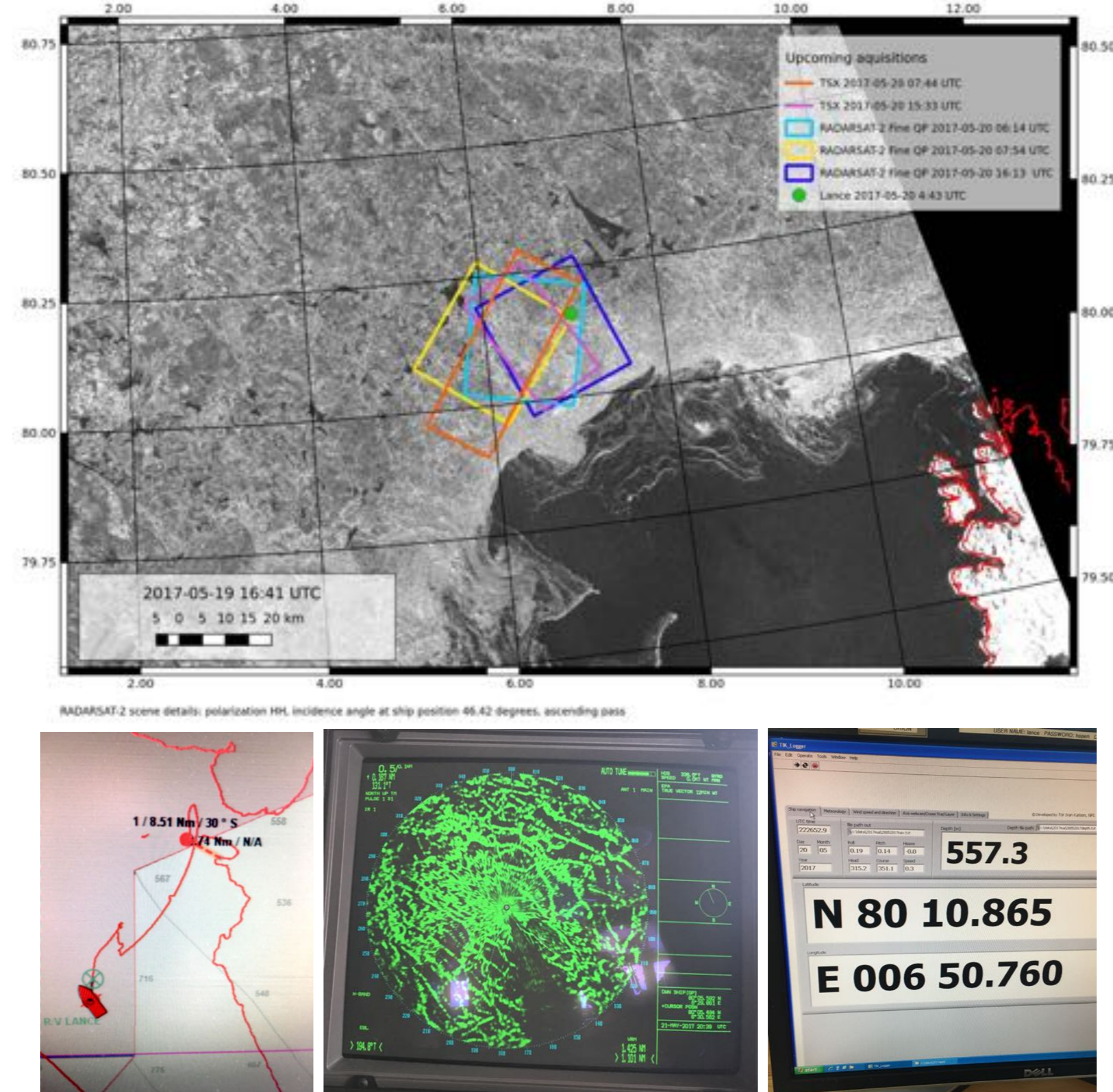
## In situ Measurements

- Hourly visual ice watch observations from deck
- 6 CTD water stations with sampling
- 5 Snow pits and ice coring stations
- Snow and ice thickness tracks - magnaprobe, EM31 and drilling
- Optical/Hyperspectral radiance - upwelling and downwelling



## Remote Sensing

Position tracking and route planning to match the pre-ordered satellite images - ideally get in situ data into SAR images (Radarsat-2, ALOS-2, TerraSAR-X, and Sentinel-1)



Workshop tasks on GIS projections, image alignment, processing and classification.

## Safety

Learning about polar bear watch, ice stability, ship and equipment safety and communication.



## Student Projects

Objective to either work with collected data, or discuss a 'big picture' problem in the Arctic. Submitted reports covered:

- Methods and validation of remote sensing of sea ice, snow and ocean water applications
- Comparison of observations to global climate models
- Ecological impacts of climate change

**Some projects are the beginnings of scientific papers and international collaboration**

## 2018 Alaskan Field School

The second Field school is currently being planned:

**Early June 2018 at Utqiagvik (Barrow), Alaska**

**Arctic Coastal Environments in Rapid Transition**

- Permafrost, Land-fast sea ice, Lagoon ice, Tundra
- Coastal erosion, Sediment transfer, Hydrology, and weather events
- Remote sensing, GIS/DEM analyses, and time-series analysis
- Arctic people - living in and utilising sea ice

## 2019 Calgary Workshop

The final School will be a Capstone Synthesis Workshop in Calgary and the Kluane Lake Research Station, Yukon, Canada.

- Summarise the state of the art in remote sensing of ice and polar ocean conditions
- The impacts of climate change on the Arctic environment, ecosystems and people
- Identify emerging issues in sea ice prediction, plus short and long-term prediction of meteorological and ocean conditions
- Focus on human activities in Arctic environment and stakeholder needs

## Exchange Program

Exchange program in 2018 and 2019: 12 months total exchange support to build and encourage cooperation between the international partners, staff and students. To be advertised shortly.

## Student Benefits

- Get excited about the Arctic science and bring home the excitement, pass it on to other people, also outside universities
- Learn new things, while experiencing the science, and from each other (scientists/instructors learn A LOT too!!!)
- Form new connections, start new collaborations (even publish papers based on project results)
- Have fun while learning about the Arctic

## Educational Benefits

- Field schools and Workshops give:
  - Valuable experience in the physical Arctic environment
  - Knowledge on how scientific measurements are performed
  - Lectures and training from leading experts in the field
  - Real experimental data for research and study courses
- Exchange gives:
  - Improved academic collaboration and internationalisation
  - Access to a wider set of courses and skillsets
- Long-term aims:
  - Learn and document best-practices in assessment reports
  - Foster long-term collaboration between partners
  - Obtain re-usable material for future teaching resources

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