

## SCIENTIFIC PROGRAMME

Sixty minutes are allocated for each lectures in eight different sessions.

### Session-I: Introduction

### Session-II: Introduction to Arctic research

### Session-III: Observing the Arctic environment

### Session-IV: The Arctic Atmosphere

### Session-V: Monitoring and forecasting the Arctic ocean and ice. Part 1

### Session-VI: Monitoring and forecasting the Arctic ocean and ice. Part 2

### Session-VII: Arctic ocean circulation

### Session-VIII: The Marine Ecosystem of the Arctic Ocean.

### Session-XI: Closing session.

## ACCOMMODATION AND TRAVEL

Shared hostel/shared hotel accommodation support can be provided for Students, on request.

Travel supports for Indian participants are equivalent to 2 tire AC train fare from the shortest distance of their parent organisation, whereas accommodation may be provided on sharing basis only. For International participants: Economy airfare according to agreement with each selected participant.

## Application Deadline

Please fill in the on-line application (<https://www.iaws2018.ncaor.gov.in>) no later than 30 July 2018.

For more details and updates, please see the website: <https://www.iaws2018.ncaor.gov.in>

## ORGANISING COMMITTEE

**Nuncio Murkesh**, ESSO-NCAOR, India, Co-Chair

**Lasse Pettersson**, NERSC, Norway, Co-Chair

**Divya David**, ESSO-NCAOR, India

**Bente E. Johannessen**, NANSI, Norway

**Nandini Menon**, NERCI, India

**Avinash Kumar**, ESSO-NCAOR, India

**Lalit Kumar Ahirwar**, ESSO-NCAOR, India

**Sourav Chatterjee**, ESSO-NCAOR, India

## DEADLINES AND IMPORTANT DATES

Public announcement	: 01 June 2018
Student online applications due by	: 25 July 2018
Evaluation and selection	: 20 Aug 2018
Invitation to selected participants	: 03 Sep 2018
Acceptance of participation	: 10 Sep 2018
Organizing travel and visa invitation	: 17 Sep 2018
Distribution of background information to student participants	: 01 Oct 2018
Start of research school	: 28 Oct 2018

## CONTACT DETAILS

### Nuncio Murkesh

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## INTERNATIONAL INTERDISCIPLINARY PhD AND POST-DOC WINTER SCHOOL



Nansen  
Scientific  
Society



The Arctic Ocean: atmosphere, ice and ocean interactions – implications for future climate and human activities

October 28-November 2, 2018

Sponsored by:

Research Council of Norway ARCONOR project,  
Nansen Scientific Society and  
Earth System Science Organisation, Govt of India

Organised by:

Earth System Science Organisation  
National Centre for Antarctic and  
Ocean Research

An autonomous body under the Ministry of  
Earth Sciences, Govt. of India

Headland Sada, Vasco-da-Gama,  
Goa 403 804, India

## ABOUT THE SCHOOL

The consequences of climate change are particularly evident in the Arctic. Significant changes and reductions in Arctic sea ice extent and volume opens for expansion of economic activities such as shipping, tourism, fisheries, as well as gas and oil extraction. Changes in sea ice cover and distribution have and will have consequences for national and international management of and activities in the Arctic waters.

Towards this endeavour, both India and Norway are working together to understand the dynamics of Arctic Ocean and its implications for future climate and human activities. The Arctic region is of special importance due to its critical role in governing global climate, sea level and biodiversity. The scientific issues pertaining to the Arctic has significance much beyond its geographic extent, through atmospheric and ocean tele-connections influencing e.g. the warming of the Indian Ocean, sea level rise and marine ecosystem, etc. The knowledge gained in the Arctic will also be much beneficial to countries like India in developing strategies and missions to study the impacts of climate change.

Regionally and seasonally changing sea ice conditions influence accessibility and exploitation of natural resources, creating new challenges, needs, and opportunities. Sustainable activities in the Arctic require new multi- and cross-disciplinary knowledge addressing the sea ice and climate conditions, the state and changes of the environment, navigation and operational conditions, technology, economy, legal aspects, geopolitics etc. Satellite Earth observation data and model reanalysis are crucial sources of environmental information needed for safe and efficient operations in remote Arctic waters. This research school will provide the participants with adequate knowledge and strengthen cooperation between students and scientists from India, Norway, Europe, Russia and the USA sharing adequate knowledge.

Scientists and experts will contribute with 22 lectures, practical group work on four subjects and with interactive student group work and teacher sessions, as well as interactive reporting. The participating students (about 30) are required to contribute to and challenged to complete a (draft) student report during the course of the winter school. The purpose of this report is to be the basis for a peer-reviewed student-paper to be written and submitted after the research school for publication in an international scientific journal.

## ABOUT PARTICIPATION

The total number of students is limited to 30 participants from India and abroad. Indian and international PhD students and Post-doc candidates in fields relevant to the overall topics (see lecture program) of the research school will be given preference in the selection of participants.

There is no participation fee for attending the research school. Accommodation at NCAOR campus or nearby Guesthouse (two in shared rooms), and three daily meals (see schedule), will be covered for all student participants. Students who will need travel support should indicate this in their application, including approximate funding needed. Indian students are expected to apply for domestic travel grant from their host university/institution. International students will be provided with an official invitation from ESSO-NCAOR and are responsible to apply for conference visa to India in due time.

## WINTER SCHOOL COORDINATORS

### **M. Ravichandran**

Director, National Centre for Antarctic and Ocean Research (ESSO-NCAOR), Goa, India

### **Lasse H. Petterson**

Director for International Cooperation, Nansen Environmental and Remote Sensing Center (NERSC), Bergen, Norway

### **Ola M. Johannessen**

Nansen Scientific Society (NANSI), Bergen, Norway

## RESOURCE PERSON

M. Ravichandran, ESSO-NCAOR, India  
Shailesh Nayak, NIAS, India  
Ola M. Johannessen, NANSI, Norway  
Lasse H. Petterson, NERSC, Norway  
R. Krishnan, ESSO-IITM, India  
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K. P. Krishnan, ESSO-NCAOR, India  
Leonid P. Bobylev, NIERSC, Russia  
Elena Shalina, NIERSC, Russia  
Einar Olsson, NERSC, Norway  
Kesav Kumar, ESSO-NIOT, India  
Richard Davy, NERSC, Norway  
Anton Korosov, NERSC, Norway  
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A. Prabhu, ESSO-IITM, India  
Sandip Oza, SAC, ISRO, India  
Divya David, ESSO-NCAOR, India  
Sourav Chatterjee, ESSO-NCAOR, India  
Subeesh, ESSO-NCAOR, India

## SCIENTIFIC COMMITTEE

### Chairman

**Shailesh Nayak, NIAS, India**

### Members

**M. Ravichandran, ESSO-NCAOR, India**

**Ola M. Johannessen, NANSI, Norway**

**R. Krishnan, ESSO-IITM, India**

**K. P. Krishnan, ESSO-NCAOR, India**

**Lasse H. Petterson, NERSC, Norway**

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**Anton Korosov, NERSC, Norway**