

# THE SAGHAA ALBUM /

SaGHAA-2017



SaGAAN-2015



SaGAA-2012



SaGAA-2011



707, BHICAJI CAMA BHAWAN, BHICAJI CAMA PLACE, NEW DELHI-110066  
PHONE: 011-26186350, 011-46014233 E-MAIL: LIGHTS2003@GMAIL.COM  
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SaGHAA 5

Sponsored by



Ministry of Earth Sciences



NCAOR



Norwegian Embassy

THE 5TH NATIONAL CONFERENCE ON  
**Science & Geopolitics of**  
**HIMALAYA-ARCTIC-ANTARCTIC**

**FOCUS: TECHNOLOGICAL INNOVATIONS AND RESEARCH EXPEDITIONS**

**FEBRUARY 26-27, 2019, INDIA INTERNATIONAL CENTRE, NEW DELHI**

Organised by



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## Context /

Polar regions and their geopolitics is a constantly changing field where new equations emerge everyday with hypotheses for solutions being proposed constantly. The publication of Fifth Assessment Report of the Intergovernmental Panel on Climate Change (PCC-2013) has brought to light the grim picture of a warming globe. The increasing loss of sea ice in Arctic, breaking away of large chunks of ice shelves in West Antarctica and Antarctic Peninsula and rising sea level, has necessitated urgency of discussions on the role of mankind in mitigation and adaptation to the new scenario. Ever increasing pressure on high seas for exploitation of fisheries and exploration for non-living resources has seen growing activities in areas which were considered to be too inaccessible for economic exploit, couple of years before. Newer collaboration and research cooperation is evolving in both Arctic and Antarctic. More nations from the third world are proposing to build research stations in Antarctica while Russia and Canada are proposing to open their Arctic Bases to researchers from other countries. This would also

involve a greater need for technological innovations that would assist rigorous research expeditions into the lesser known cryospheric realm. The recently concluded conference on Arctic and Antarctic (Polar 2018) in Davos, Switzerland, has laid emphasis on promoting international partnership in scientific endeavours.

Our own Himalaya, and the Himalayan ecosystem, and its environment as a whole, too is under strain due to the changing climatic patterns, especially that of monsoons and westerlies which bring precipitation to different regions of this long mountain chain spread over several Asian nations, —Afghanistan, Bhutan, China, India, Nepal, Pakistan, Myanmar. The Himalaya and its problems are not confined to one nation. These transcend the man made geographic borders. The geological set up and tectonic framework of young rocks has made the region unstable and at high seismic risk. To add to this, the sudden outbursts of lakes formed due to damming of glacial lakes at high altitude (GLOF) and frequent cloud bursts have resulted in great calamities in near past such as Nepal earthquake and the Kedarnath tragedy. Scientists concerned with

Himalayan system therefore need to join hands and work together to usher an era of scientific cooperation in this ~2,500 km long, highly inaccessible, pristine and fragile environment that constitutes water tower to one of the most densely populated region of world .

The Conference on Science and Geopolitics of Himalaya, Arctic and Antarctic (SaGHAA 2019) will strive to evolve concerted dialogue regarding such and other inter-disciplinary issues pertaining to these cryospheric regions.

LIGHTS Research Foundation has been working towards a convergence of these aspects for nine years now. Beginning in 2011, the last Conference was held in 2017 that attempted greater amalgamation of research with ground truthing on the three poles.

#### **Objectives /**

SAGHAA 2019 aims to develop consensus among the scientists and policy makers towards research and innovations. It will strive to encourage higher degree of cooperation and collaboration in cross border scientific programmes among likeminded research groups/institutions for sustaining research under

hostile environment and help resource sharing for the benefit of mankind in general.

#### **Focus /**

Climate change and technological advancement have acted as big contributors in providing greater accessibility to the Arctic, Antarctic and Himalayan region. SAGHAA 2019 plans to focus on the developments in the three polar regions and Southern Ocean under the climate change scenario. The consequences of warming Southern Ocean, its influence on carbon sequestration, modulating monsoons and on the marine biodiversity will be a new addition to the widening scope of SAGHAA. The Arctic –Antarctic teleconnection to monsoons, changing pattern of the precipitation both in intensity and duration over Himalaya, the dynamics of Himalayan glaciers, snow cover assessment, adaptation of the societies in Himalaya to climate change and more will be the current focus.

SAGHAA 2019 will also highlight the challenging marine technology and management aspects of expeditions to Polar Regions that constitute the backbone of conducting research in inaccessible areas of Arctic, Antarctic, Himalaya and Southern Ocean.

### **ADVISORY COMMITTEE**

**Dr B Meenakumari**  
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Head, SPLICE, DST

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**Shri Vijay Kumar**  
Scientist G, MoES

**Dr Gufran Beig**  
Project Director, IITM

# SaGHAA 2019: Technological Innovations and Research Expeditions

**Date: February 26-27, 2019**

## Tentative Session 1

### Current trends in polar sciences

- a. Arctic-Antarctic- Himalayan Cryosphere-Response to Climate Change (teleconnections / monsoons/ atmospheric sciences)
- b. Recent Research Initiatives in Solid Earth Antarctic Geology
- c. India-Antarctic: Relationship through Time and Space
- d. Crustal Evolution of East Antarctic Craton

## Tentative Speakers

Prof N C Pant (DU),  
Dr. R Krishnan, IITM  
Dr G Beig, IITM  
Prof S M Singh( BHU),  
Dr Sandip Roy (GSI),  
Dr S P Shukla (GSI),  
Dr V Ravikant (IIT Kgp),  
Dr Abhijit Majumdar (BSIP),

Dr Pavan Govil (BSIP),  
Dr Walliur Rehman (NCAOR),  
Dr Rahul Mohan (NCAOR),  
Dr Ashit Swain (GSI),  
Dr Thamban Meloth (NCAOR),  
Dr Raj Kumar (SAC-ISRO),  
Dr I M Bahuguna (SAC-ISRO),  
Dr A Ganju (SASE),

Dr Parmanand Sharma (NCAOR),  
Dr Navin Juyal, (PRL),  
Dr Nalan Koc (NIPR Norway),  
Dr Milap C Sharma (JNU),  
Dr M R Bhutiyan (DRDO),  
Dr B S Mahesh, (NCAOR),  
Dr Lavkush Patel (NCAOR),  
Prof A P Dimri (JNU),  
Dr Rajeev K Mehajan (SERB)

## Tentative Session 2

### Ocean Exploration

- a. Achievements of Indian Expeditions to Southern Ocean
- b. Dynamics of the Southern Ocean, Intra-annual and Inter-annual variability water masses structure
- c. Biogeochemical fluxes and their Influence on the Trophic structure, Biodiversity

## Tentative Speakers

Dr SWA Naqvi (CSIR),  
Dr S C Shenoi (INCOIS),  
Dr M Sudhakar (CMLRE),  
Dr Ravichandran (NCAOR),  
Dr G M Nayak (Goa Univ),  
Dr S Tripathy (NCAOR),

Dr S K Singh (NIO),  
Dr CT Achuthankutty (NCAOR),  
Dr Anil Kumar (NCAOR),  
Dr B Jena (NCAOR),  
Dr A J Luis (NCAOR),  
Dr Avinash Kumar (NCAOR)  
Dr K Satheesan (CUST)

## Tentative Session 3

### Geopolitics

- a. Should we have Arctic (Ny Alesund) model of international research Bases as against building new Research Stations in Antarctica by different nations?
- b. Progress in Adoption of Liability Annex to Madrid Protocol by Consultative Parties
- c. Developments in Antarctic geopolitics

## Tentative Speakers

Dr S Rajan (INCOIS),  
Dr Krishnan (NCAOR),  
Dr Bimal Patel (GNLU),  
Dr Anoop Tiwari (NCAOR),

Dr Sanjay Chaturvedi (South Asian Univ),  
Dr. Luther Rangreji (MEA) ,  
Dr M K Rao (MEA),  
Prof (Mrs) S K Verma (ISIL)

## Tentative Session 4

### Ice Class Research Vessels

- a. Cost-Benefit studies for chartering vs. owning an Ice Class Vessel
- b. Ice Class Research Vessel for Indian Polar Programme

## Tentative Speakers

Director, NCAOR,  
Dr Javed Beg (NCAOR),  
Dr Atmanand (NIOT),  
Dr M M Subramanyan (NCAOR),  
Dr Rajasekhar (NIOT),

Speaker form Indian Maritime University,  
Visakhapatnam  
Speaker form Garden Reach Ship Builders  
Representatives from Ship Designers





### Tentative Session 5

#### Technological innovation as an aid to scientific exploration in Polar areas

- a. Unmanned Aerial Vehicles
- b. Deep Ice Drilling
- c. Energy Generation in Polar Areas
- d. Waste Disposal
- e. Geophysical surveys
- f. Deep Sea Remotely Operated Vehicles
- g. Upward drilling from base of ice shelves/ice bergs

### Tentative Speakers

Dr Atmanand (NIOT),  
 Dr G A Ramadas (NIOT),  
 Dr VM Tiwari (NGRI),  
 Dr Rajasekhar (NIOT),  
 Mr Shree Verma (CN Technology),  
 Dr P L N Raju (NESAC),

Personnel (BLV India),  
 Personnel (The ABAN Group),  
 Personnel (ExxonMobil),  
 Personnel (NAL),  
 Personnel (Enercon India),  
 Personnel (Norinco)

### Tentative Session 6

#### Building a New Maitri Station, Earth Station, Snow Vehicles and Ice Runways

- a. Site selection, design concepts, de-commissioning of Polar stations
- b. Site selection and constraints for runways
- c. Innovation in design and technology

### Tentative Speakers

Dr Javed Beg (NCAOR),  
 Dr Shailendra Saini (NCAOR),  
 Dr Rasik Ravindra (NCAOR),  
 Dr Rajesh Asthana (GSI),  
 Dr Ajay Dhar (IIG),  
 Engineers from BSF,  
 Scientists from SASE,  
 Dr Anoop Tiwari (NCAOR),

Dr Raghav (SERC),  
 Scientists from VRDE (DRDO),  
 Andreas Nitschke /  
 Torsten Hass, Ramboll IMS  
 Ingenieurgesellschaft mbH  
 Dr. Vasily Kaliazin / Capt Mirella  
 Krüger, ALCI,  
 Mr. Emil Grimsson, Arctic Trucks,

Mr. Harald Häge. Kassbohrer,  
 Scientist from NRSC  
 Mr Jarle Berg-Oksfjellelv, LNS  
 Spitsbergen AS.  
 Cdr Manoj Kumar,  
 CEO Grintex India Ltd.  
 Saket Kandoi, Vice President  
 Titagarh Wagons Ltd., Kolkata.

### Tentative Session 7

#### Manning the Expeditions

- a. How to motivate and attract participants
- b. Team preparedness: Selection/Training
- c. Medical – Changes in medical parameters since inception of Antarctic Programme
- d. Lessons learnt
- e. Logistic challenges
- f. International cooperation in ship time (drawing from ALCI experience)

### Tentative Speakers

Dr Yogesh Ray (NCAOR)  
 Dr Anand K Singh, Scientist.  
 Dr. Ravi Mishra, Scientist  
 Dr Pradip Malhotra (Gov of WB),  
 Dr Arun Chaturvedi (GSI),

Gen S.S. Sharma (R & D Eng Estb, DRDO),  
 Dr Shailendra Saini (NCAOR),  
 Dr Rajesh Asthana (GSI),  
 Mr Elango P (IIG), J Krishnamoorthy (IIG),  
 Dr Shivani MV (IIM)

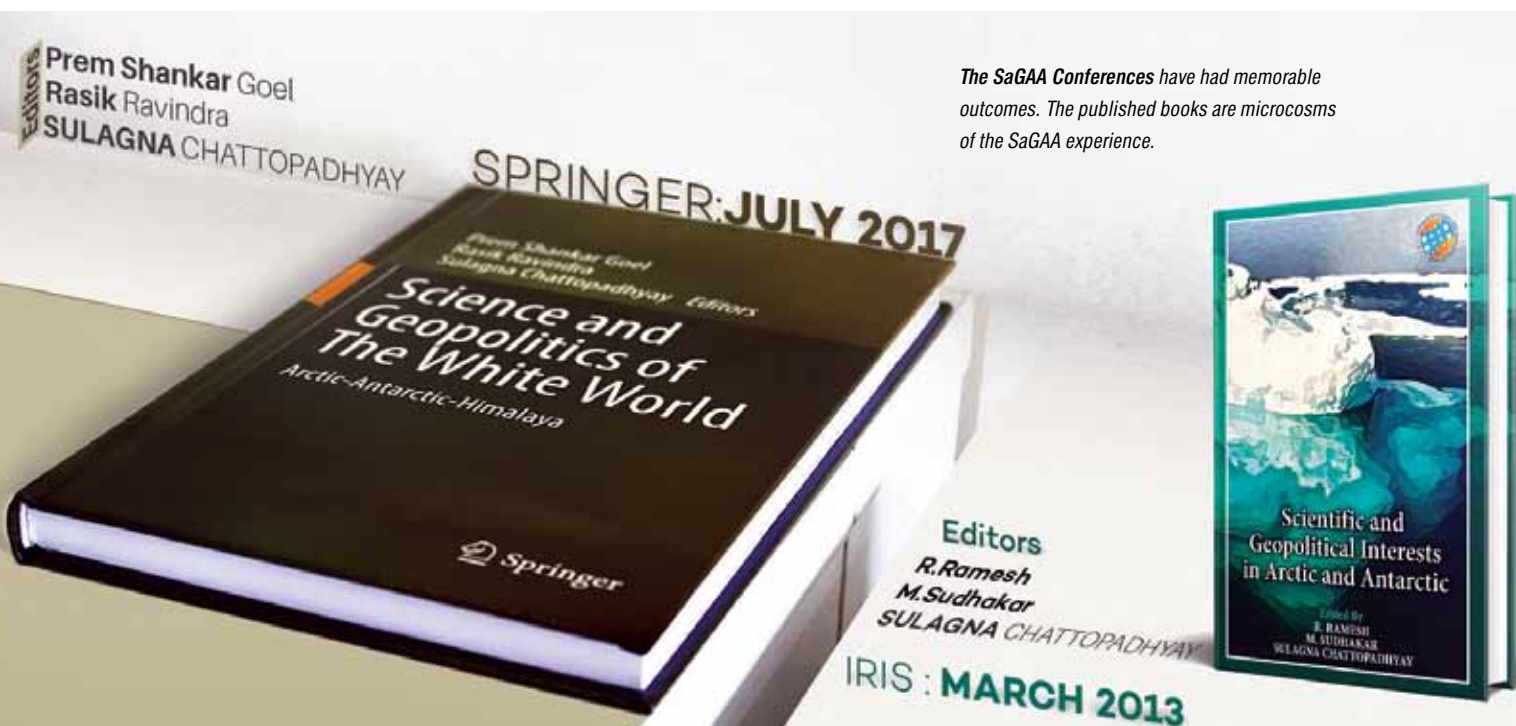
## History of SaGAA /

SaGHAA IV 2017 /  
Science & Geopolitics of Himalaya-Arctic-Antarctic, an international conference was held at JNU Convention Centre, New Delhi, India during November 30 and December 1 with a focus on climate change. Various sessions— Climate Change, Health of Himalayan Glaciers and its Biodiversity, Geopolitics of the Poles, Ocean Research, and Arctic and Antarctic Cryospheric Research were organised. Unprecedented changes in environment and morphology and emergence of political interventions is encouraging exploitation of Cryospheric areas laying a major stress and a rise in demand and conflict. Renowned international scientists such as Dr Walter R Roest, Dr Nalan Koc, Dr

Arild along with H.E. Nils Ragnar Kamsvag and various other senior scientists and directors of Indian institutions deliberated during the Conference. Dr M.N. Rajeevan, Secretary, Ministry of Earth Sciences was the chief guest with over 17 directors attending the two days of the conference, making it a resounding success.

## SaGHAA III 2015 /

An international conference on Science and Geopolitics of Arctic-Antarctic-Himalaya (SaGAA 2015) was held at India International Centre, New Delhi, India during 29-30 September. Continuing the practice of previous two SaGAA Conferences it again brought together; thoughts, experiences, researches and advocacies on cold regions. Various sessions—





Geopolitics of the Polar Region; Global Climate Change: Polar Region and Third Pole; Living and Non-living Resources Potential: marine protected areas and geopolitics; Tourism Industry and the Poles were organised. These sessions not only helped to build better understanding of geopolitics but also brought new researches in front that are being carried around globe to understand dynamics and potential of these regions. Eminent scientists including scientists such as Dr. P.S. Goel, Dr. Shailesh Nayak, Dr. M. N. Rajeevan, Dr. Sanjay Chaturvedi, Dr. Uttam Kumar Sinha, Dr. R. Krishnan, Dr. Geir Moholdt, Dr. Anil V Kulkarni, Dr. M.R. Bhutyani, Dr. David E. Rheinheimer, Dr. Ravishankar, Dr. Rajan, Dr. Rasik Ravindra, Thórir Ibsen, Marcus Holknekt, Grahame Morton and Sergey A Borovik contributed to the conference. It was an interactive conference with more than 100 cold region enthusiasts attending the Conference.

SaGAA II 2012 /  
The International Conference on Science and Geopolitics

of Arctic and Antarctic (I-SaGAA 2012) in New Delhi was in continuation to SaGAA National 2011. The International Conference held between March 9 and 11, successfully bounded the session on Geopolitics: UNCLOS and the Global Commons Geopolitics of the Global Realms; Biotechnology: Microbial resources in Polar Regions Dynamics in Polar Marine Biodiversity (Prokaryotes, vertebrates and invertebrates) Information Exchange and Intellectual Property Rights, Resources of the Southern Ocean; Ice Core for Paleo Climate, Southern Ocean and Solar Impact: Sea ice melting, Ice core studies, Southern Ocean Experiments Paleo climate studies; Polar Atmospheric Research: Ozone depletion Meteorological Studies. Some of the senior scientists present were Dr. P S Goel, Dr. Shailesh Nayak, Dr. S.W.A. Naqvi, Prof. S. K. Tandon, Prof. John Turner, Dr. Timo Koivurova, Dr. Victor Smetacek, Dr. John P. Bowman, Prof. Nalan Koc, Prof. John M. Reynolds, Dr. George John, Dr. S. Shivaji, Dr.

B. Meenakumari, Dr. S. Rajan, Dr. Ramesh, Dr. Rasik Ravindra apart from representatives from the countries such as United Kingdom, Finland, Germany, Australia, Norway and Chile. The participation of about 100 scientists was observed in the Conference. Marvelously remarkable was that the number of participants remained the same from the first day to the last day marking the riveting nature of the proceedings.

SaGAA I 2011 /  
The first National Conference on Science and Geopolitics of Arctic and Antarctic was held between January 14 and 15. The sessions saw the gathering of eminent scientists such as Dr. Shailesh Nayak, Dr. Ajit Tyagi, Dr. N.C. Mehrotra, Dr. Anil K. Gupta, Dr. Rasik Ravindra, Dr. S. Shivaji, Dr. V.M. Tiwari, Dr. T. Meloth, Dr. Subba Rao, S. K. Mehta and many more. Dr. S.K. Das and Dr. Ravindran and Dr. M.Sudhakar also attended the proceedings. It was an extremely successful event which paved the way for the following Conferences on the subject.