



## Conference Information

The 2<sup>nd</sup> International Indian Ocean Expedition (IIOE-2) is a multi-national, multi-institutional programme to advance our understanding of the physical, chemical, biological, geological and climatological aspects of the Indian Ocean to enhance its role on the socio-economy of the region. To translate the knowledge of the Indian Ocean for the benefit of the population residing in the countries on the rim, it was originally proposed to organize a Science Conference in March 2020 to discuss the results of the activities of IIOE-2 since its launch. However, due to the COVID-19 pandemic situation the IIOSC-2020 conference had to be postponed and is now being rescheduled to March 2022.

The IIOSC-2022 is sponsored by the Ministry of Earth Sciences (MoES), Govt. of India and will be held during 14-18 March 2022 in Goa, India, co-hosted by the National Institute of Oceanography (NIO), Goa, National Centre for Polar and Ocean Research (NCPOR), Goa, Goa University and Indian National Centre for Ocean Information Services (INCOIS), Hyderabad, India. We are scheduling an in-person conference (with an option to join online) in the hope that COVID situation eases by then. In the event that the travel situation does not improve, IIOSC-2022 will still go ahead as an online event.

The United Nations General Assembly has declared the decade of 2021-2030 as the UN Decade of Ocean Science for Sustainable Development ('the Ocean Decade'). The main aim of "Ocean Decade" is to stimulate ocean science and knowledge generation to produce new opportunities for sustainable ocean uses and to provide an opportunity to the scientists and stakeholders from diverse sectors to develop the scientific knowledge for the well being of the mankind. The IIOSC conference is expected to further discussions on the collaborative activities being planned by various stakeholders as part of the 'Ocean Decade'. A specific technical session "IIOE-2 contribution to sustainable development: toward the UN Decade of ocean science" related to this topic is also planned.

## Call for abstracts

The Conference will be conducted through several keynote addresses, plenary talks and presentation of scientific papers (both oral and poster) organised under several major themes as listed at

<https://iiosc2020.incois.gov.in/IIOSC2020/TechnicalSessions.jsp>

We are now inviting abstracts relevant to Indian Ocean for scientific sessions spread over the above themes. Papers/abstracts highlighting societal relevance of the research work are encouraged.

The abstracts/papers should be submitted online at

<https://iiosc2020.incois.gov.in/IIOSC2020/Abstracts.jsp>

**Revision of IIOSC-2020 Submissions:** Authors who have already submitted abstracts/papers for IIOSC-2020 are requested to confirm if their abstracts are still in order and if they would like the organisers to evaluate them afresh for possible presentation in IIOSC-2022. The authors will also have an opportunity to revise and resubmit their abstracts with their latest research. Authors are requested to confirm to [iiosc2020@incois.gov.in](mailto:iiosc2020@incois.gov.in) whether they would like to go with the original submission or a revised submission will be made before the closing date for abstract submission. Only after receipt of such email confirmation, their old abstracts will be forwarded to the respective session chairs for re-evaluation.

**New Submissions for IIOSC-2022:** New abstracts/papers are also invited for all the technical sessions. All abstracts received [Old - confirmed / Old - revised / New] will be sent to the Session Co-Chairs for evaluation regarding their suitability for Oral / Poster presentation.

The last date for the submission of abstract is **31 October 2021**.

# Themes

| Theme | Theme Name  |
|-------|---|
| 01.   | <p><b>IIOE-2 contribution to sustainable development: toward the UN Decade of ocean science</b></p> <p><i>[This session will focus on the benefits of IIOE-2 to society and how they can be maximized and sustained. The abstracts may highlight innovative ideas to generate useful information/products from existing knowledge. The session also invites abstracts which suggest what else can be done in terms of observation systems/models to help the translation of science to benefit society as well as blue economy and sustainable fisheries.]</i></p>  |
| 02.   | <p><b>Impacts of climate change on the Indian Ocean</b></p> <p><i>[The Indian Ocean is warming faster than other two major oceans and there are reports of heat accumulation in the Indian Ocean. This session calls for abstracts related to impacts of climate change on the Indian Ocean. The scope of this session may include observed/modelled physical, biogeochemical and ecological changes related to global change and the impact of climate change on society.]</i></p>   |
| 03.   | <p><b>Circulation and Boundary currents in the Indian Ocean</b></p> <p><i>[The Northern Indian Ocean has unique monsoonal circulation and this makes the Indian Ocean a "Nature's Laboratory" to understand and study different facets of oceanography while the Southern Indian Ocean is filled with classical wind driven gyres. Abstracts are solicited on studies focusing on reversing monsoonal circulation, coastal upwelling, boundary currents, Sub-tropical gyres, Southern Ocean circulation and dynamics, and their impacts on the Indian Ocean circulation.]</i></p>   |
| 04.   | <p><b>Ocean observations and data in the Indian Ocean: toward an ocean data information system</b></p> <p><i>[Basin scale programmes such as Indian Ocean Observing System (IndOOS) and Global Ocean Observing System in the Indian Ocean (IOGOOS) have motivated recent advances in observing systems (such as moorings, Argo and drifters) and sensor-based observations including biogeochemical parameters (such as Chl, dissolved oxygen, Nitrate, pH and bio-optics). These new-age observation systems, including satellite based, have provided a tremendous amount of data that has helped in enhancing our understanding of the Indian Ocean. The session aims to highlight the recent results from such new generation observing systems, other emerging technologies and data information systems.]</i></p>                                     |
| 05.   | <p><b>Biogeochemistry and Microbiology of the Indian Ocean: Recent advances</b></p> <p><i>[The Indian Ocean hosts one of the thickest oxygen minimum zones in the world ocean. It is also characterized by processes such as denitrification and anammox. The ecosystem response to global climate change has significant impacts on the microbial loop and hence on the biogeochemistry of the Indian Ocean. Ocean acidification is also likely to impact the marine ecosystem, particularly the species that have calcareous shells. The primary productivity is reported to have decreased over the last century and has shown signatures of decadal variability. The session invites abstracts on recent results and findings towards understanding the microbiology, biogeochemistry, deoxygenation and nutrient cycling in the Indian Ocean.]</i></p> |
| 06.   | <p><b>Ecology of the Indian Ocean: Understanding and Predictability</b></p> <p><i>[Countries around the Indian Ocean have large populations living along the coast that depend on resources from the sea for their livelihoods. Global warming has impacted coral reefs, mangroves and other ecosystems. via ocean acidification, eutrophication of the coastal seas and ecosystem response and has implications to fisheries and their sustainability. The recent advancements in the ocean biogeochemical and ecological models have potential, not only to understand the processes, but also to predict change in the future, including the impact on fisheries.]</i></p>   |
| 07.   | <p><b>Air-Sea interactions, exchange of trace gases and related processes</b></p> <p><i>[Air-sea interactions in the Indian Ocean are important to understand the role of Indian Ocean in the global element cycles, heat exchange, circulation and hence regional climate. Trace gases such as N<sub>2</sub>O, DMS, methane, CO, and halocarbons also play a significant role in modulating the climate and atmospheric chemistry on different time scales. This session invites abstracts related to ocean-atmosphere interactions, heat exchange, aerosol formation &amp; deposition and trace gas fluxes.]</i></p>  |
| 08.   | <p><b>Atmospheric Chemistry and pollution</b></p> <p><i>[The composition and chemistry of the atmosphere over the Indian Ocean region is dominated by the circulation of the South Asian (Indian) monsoon system: the winter monsoon is advecting gaseous and particulate pollution from the heavily populated and biofuel intensive regions out over the northern Indian Ocean. The resulting thick haze extends over millions of square kilometres to the ITCZ. Therefore, the Indian Ocean presents a globally unique, natural laboratory to the atmospheric scientist. Abstracts on atmospheric chemistry, troposphere/stratosphere exchange and atmospheric pollution may be contributed in this session.]</i></p>   |



# Themes

| Theme | Theme Name   |
|-------|--|
| 09.   | <p><b>Coastal and estuarine processes: Anthropogenic impacts and vulnerabilities</b></p> <p><i>[This session is expecting presentations on studies related to coastal processes such as shoreline changes, sea level increase, coastal inundations, vulnerabilities and coastal zone management. Nutrients are getting dumped into coastal waters via estuaries and have modified the coastal ecosystem considerably. The session also expects presentations related to coastal eutrophication, pollution, microplastics and toxins.]</i></p>  |
| 10.   | <p><b>Climate and monsoon variability: Lessons from paleo-climatic studies and links to polar regions</b></p> <p><i>[The understanding of past is the key to the future. Various proxies such as <math>^{13}\text{C}</math>, <math>^{18}\text{O}</math>, and other isotopic and biomarker tracers in lake sediments, marine cores, speleothems and tree rings provide critical insights into the climatic events of the past. Though global warming has led to decrease in sea-ice cover in the Arctic Ocean, it has increased over Antarctica for various reasons such as westerly wind forcing, southern annular mode, El Niño-Southern Oscillation (ENSO) and stratospheric ozone depletion. Therefore, it is imperative to understand the linkages of the polar ocean to the monsoon. This session is expecting presentations on paleo-climate studies and linkages of monsoon variability to the polar oceans using climate proxies.]</i></p>   |
| 11.   | <p><b>Inter-basin interactions in the Indian Ocean</b></p> <p><i>[Inter-basin interactions such as exchanges between Indian and Pacific Oceans via the Indonesian through flow and Agulhas retroflection between Indian and Atlantic Ocean significantly affect the dynamics of the Indian Ocean. Other processes in the Indian Ocean are precursors to El Niño, Indian Ocean Dipole, MJO and affect the global climate. This session expects presentations on inter-basin interactions and their impacts of global climate and ecosystems.]</i></p>   |
| 12.   | <p><b>Marginal seas of the Indian Ocean</b></p> <p><i>[Marginal seas such as Red Sea, Persian Gulf, Andaman Sea and Timor Sea play a defining role in modulating water mass characteristics of the Indian Ocean. Some of them are sources of high salinity water and act as a source of oxygen into deeper layers. The Andaman Sea connects the equatorial Indian Ocean to the Bay of Bengal and play a significant role in freshwater distribution in the bay. Abstracts for this session may include presentations highlighting the role of marginal seas in modulating dynamics and biogeochemistry of the Indian Ocean.]</i></p>   |
| 13.   | <p><b>Geology, geophysics and seabed mapping of the Indian Ocean</b></p> <p><i>[The session welcomes all contributions related to the Geology, Geophysics, and Geochemistry of the Indian Ocean. The Indian Ocean is dynamic in terms of geological processes, with seafloor spreading at three contrasted mid-ocean ridges, subduction at the Sunda Trench and incipient collision off Makran inducing some of the most devastating earthquakes, and a wide diffuse plate boundary. Exceptional features also include several major hotspots (some still active) at the origin of large volcanic plateaus and isolated seamounts, a peculiar geochemical signatures from the mantle, complex continental passive margins induced by the fragmentation of Eastern Gondwana, and the huge sediment deposition consecutive to the collision of India with Eurasia which resulted in huge submarine canyons meandering on the ocean floor. Mineral and hydrocarbon exploration of the ocean floor (polymetallic nodules, seafloor massive sulfides, gas hydrates...) and the extension of the legal continental shelf represent major topics of interest among the community and will also be addressed.]</i></p> |
| 14.   | <p><b>Extreme events and their impacts</b></p> <p><i>[Extreme events such as cyclones, storm surges, heavy rainfall and droughts have catastrophic effects on the well-being of populations. The number of extreme events has increased in the recent past due to global warming and is expected to increase further in future. The proposed session invites abstracts on studies pertaining to extreme events, their genesis and future projections. Mitigation plans and risk assessment may also be covered in this session.]</i></p>   |

## Workshop for Early-Career Scientists

The aim of this workshop is to bring all early-career scientists together to address and synthesize key unknowns and novel findings from the Indian Ocean, and priorities for future research. The aim of this Workshop would be to comprehensively summarize these conclusions into a peer-reviewed multi-author manuscript. The workshop is intended to facilitate the active participation of early career scientists into the global research efforts that is being conducted in the Indian Ocean.

# Venue

The venue of the conference is National Institute of Oceanography (NIO), Dona Paula, Goa

CSIR-National Institute of Oceanography (CSIR-NIO)  
IIOSC-2022 Conference Secretariat  
Dona Paula, Goa-503 004  
India  
Tel: +91 (0) 832 2450450  
Fax: +91 (0) 832 2450602, 2450603  
Website: [www.nio.org](http://www.nio.org)



# Accommodation

Accommodation for the participants will be available on payment at special rates of IIOSC-2022, in different hotels surrounding the venue.

In addition to the hotels, a few guest houses of state and central government organizations will be booked to accommodate the student participant at concessional rates.

Further details on accommodation will be updated soon on the conference website.

# Registration Fees

| Dates  | Foreign Participants                  |  |                                   |                                    | Indian Participants     |                     |
|--|---------------------------------------|--|-----------------------------------|------------------------------------|-------------------------|---------------------|
|  | Participants from Developed Countries | Participants from Developing Countries | Students from Developed Countries | Students from Developing Countries | Participants from India | Students from India |
| Till 31 <sup>st</sup> Dec, 2021<br>(Early bird)          | \$300                                 | \$200                                  | \$200                             | \$150                              | INR 8000                | INR 6000            |
| 1 <sup>st</sup> Jan, 2022-<br>15 <sup>th</sup> Jan, 2022 | \$350                                 | \$250                                  | \$230                             | \$180                              | INR 10000               | INR 7500            |
| Onsite   | \$400                                 | \$300                                  | \$250                             | \$200                              | INR 12000               | INR 9000            |

(\*The registration includes registration kit, admission to all scientific sessions, lectures, inaugural function, lunch, coffee breaks and a cultural evening and one dinner)

Accompanying persons (spouse/ any other person) will be charged \$250/ INR 8000 each which includes symposium for lunch, refreshments, one dinner and local sightseeing.

In case of unforeseen circumstances leading to the Conference being organized virtually, a proportionate amount provisioned for lunch, coffee breaks, cultural evening, one dinner, etc. will be refunded. The registration kit, copy of proceedings, etc. will be posted to the address mentioned in the registration form.

## Registration Fees Paid for IIOSC 2020:

The authors who have already registered and made the necessary payments during IIOSC-2020 may please confirm to [iiosc2020@incois.gov.in](mailto:iiosc2020@incois.gov.in) about their participation in IIOSC-2022. Authors who have already paid but are no longer proposing to submit an abstract or join the conference may please claim the refund.

## Important Dates

| Description                       | Dates              |
|-----------------------------------|--------------------|
| Abstract Submission opens         | 01 September, 2021 |
| Registration opens on             | 01 October, 2021   |
| Abstract Submission closes        | 31 October, 2021   |
| Abstract Acceptance               | 30 November, 2021  |
| Early Bird Registration           | 31 December, 2021  |
| Last Date for Online Registration | 15 January, 2022   |

## Local Tours

A half-day local tour during the conference will be arranged for interested participants. Further, paid local tours will be organized for interested groups/individuals participating in the conference. More details on local tours will be published soon on the conference website.

## Sponsor/ Exhibitor

The International Indian Ocean Science Conference (IIOSC-2022) being held at CSIR-National Institute of Oceanography, Goa will provide an opportunity to researchers and students to discuss the latest oceanographic research work and to plan future research in the Indian Ocean with regional and global implications. The global interactive event will facilitate discussions between scientists and technologists. During IIOSC-2020, we got registration from 600 participants from all over the world and similar participation is expected for the IIOSC-2022 conference. The participants include researchers, students and industry from various fields of ocean observation, computation, instrumentation and technology. Interested sponsors/exhibitors may please fill in the Sponsors/Exhibitor support form which will be available soon at conference website and send it back to us through email ([iiosc2020@incois.gov.in](mailto:iiosc2020@incois.gov.in)).

## Exhibition details including size of stalls and fees

An exhibition has been planned during the conference to showcase emerging observational systems and technology for oceanographic research, products developed by researchers, and premier public and private organisations. The exhibition will provide an opportunity to the exhibitors to showcase their products and services, besides serving as a platform for exploring new business opportunities.

The agencies involved in manufacturing ocean observation tools, software for data processing and allied sciences are invited to participate in the exhibition associated with the conference.



## Facilities

Number of Stalls available:

Size (L x W x H): 3m X 3m X 2.5m – 5 booths

Size (L x W x H): 6m X 3m X 2.5m – 5 booths

Each stall will be provided with 2 spot lights, 1 table, 2 chairs, Facia (up to a maximum of 26 characters), two 5 amp power points (220V, 50 Hz).

Stall Fees (Booking deadline: 31 December 2021):

| Stall Size                 | Foreign Companies | Indian Companies |
|----------------------------|-------------------|------------------|
| 3m X 3m X 2.5m (L x W x H) | USD 5,000/-       | INR 3,00,000/-   |
| 6m X 3m X 2.5m (L x W x H) | USD 8,000/-       | INR 5,00,000/-   |

Stall Setup: 13 March 2022

Stall Dismantling: 19 March 2022

The exhibition stalls will be allocated on first-come, first-serve basis. The fees will cover the registration and participation of two participants per booth during the conference. The exhibition registration fees are payable by demand draft/bankers cheque in favour of CSIR-NATIONAL INSTITUTE OF OCEANOGRAPHY, GOA payable at State Bank of India, Dona Paula.

## Other details

The IIOSC-2022 exhibition will have 24 hour security service during the period 13-19 March 2022. However, exhibitors are responsible for protection of their equipment and insuring them if necessary. Exhibitors are advised to close down their booth after the exhibition closing time at 18:00 Hrs each day of the conference.

Interested exhibitors can contact [iiosc2020@incois.gov.in](mailto:iiosc2020@incois.gov.in)

In case the present COVID-19 pandemic situation continues and the travel restrictions prevail, the entire IIOSC-2022 conference will be conducted through virtual mode including the poster sessions and exhibitions.

## Committees

The following committees were constituted for looking after the organization of the conference successfully.

The International Scientific Planning Committee : <https://iiosc2020.incois.gov.in/IIOSC2020/ispc.jsp>

National Organizing Committee : <https://iiosc2020.incois.gov.in/IIOSC2020/noc.jsp>

Local Organizing Committee : <https://iiosc2020.incois.gov.in/IIOSC2020/loc.jsp>



**International Indian Ocean  
Science Conference**

14-18 March, 2022  
Goa, India

CSIR-National Institute of Oceanography (CSIR-NIO)  
Dona Paula, Goa-503 004, India  
Tel: +91-832-2450450  
Fax: +91-832-2450602, 2450603

E-mail: [iiosc2020@nio.org](mailto:iiosc2020@nio.org)  
Website: <https://IIOSC2020.incois.gov.in>

Contact us:  
Chairman, Local Organizing Committee  
IIOSC-2022