

# 2023 International Symposium on Ocean Technology

## SYMPOL 2023

at the magnificent Shores of Great Cochin

13-15 December 2023



Main Theme

### Technology for Sustainable Oceans

- ▶ Noise Mitigation
- ▶ Artificial Intelligence for Ocean Exploration

### The Seventeenth Biennial Symposium on Ocean Technology, 2023 (SYMPOL 2023)

organised by department of electronics, cochin university of science and technology, kochi is scheduled to be held during 13-15 december 2023

#### CALL FOR PAPERS

Papers are invited for **SYMPOL 2023**. The papers prepared in the template downloadable from <https://sympol.cusat.ac.in> may be submitted online.

#### STUDENT POSTER PROGRAM

Papers are also invited for the student poster program. All full-time postgraduate engineering/science students or research scholars enrolled in an accredited university are eligible to be considered for the student poster competition. Accepted papers will be published in the Proceedings of SYMPOL 2023 and IEEE Xplore. For further details contact the SYMPOL Secretariat at [sympol@cusat.ac.in](mailto:sympol@cusat.ac.in) or [supriya@cusat.ac.in](mailto:supriya@cusat.ac.in)

#### TOPICS

- Underwater Sensor Technology
- Underwater Signal Processing
- Underwater Imaging
- Seismic Signal Processing
- Acoustic Holography
- Ocean Exploration Systems
- Remote Sensing
- Tsunami Warning Systems
- Underwater & Surface Communications
- Sonar Technology
- Electronic Navigation Aids
- Underwater Telemetry/Command & Control
- Marine Environment & Bioelectronics
- Marine Measurements & Data Logging
- Oceanography & Meteorology
- Marine Renewable Energy & Storage
- Underwater Acoustics & Acoustical Oceanography
- Non-acoustic Means for Underwater Applications
- Ocean Vehicles & Floating Structures
- Ocean Observing Platforms & Instrumentation
- NDE for Ocean Structures/Cables/Pipelines
- Offshore Structures & Technology
- Ocean Data Modeling & Information Management
- AI & Machine Learning in Ocean Technology

#### SCHEDULE

- Submission of Full Paper Text : 31<sup>st</sup> August 2023
- Submission of Final Paper : 15<sup>th</sup> October 2023
- Communication of Acceptance : 30<sup>th</sup> September 2023
- Symposium Dates : 13-15 December 2023

# SYMPOL 2023





# 2023 International Symposium on Ocean Technology (SYMPOL 2023)

Supriya M.H., Chairperson, SYMPOL 2023

Arun A. Balakrishnan, Coordinator, SYMPOL 2023

## Introduction

The 2023 International Symposium on Ocean Technology (SYMPOL 2023), addressing the Global Oceans, Systems and Technologies, organized by the Department of Electronics of the Cochin University of Science and Technology, Kochi with the technical co-sponsorship of IEEE-OES was held during 13-15 December 2023. SYMPOL is being organized as a biennial program and the first symposium of the series was held in the Cochin University of Science and Technology, during 18-20 December 1991 to highlight the formal opening of the Center for Ocean Electronics established in the Department of Electronics as a joint venture of the University Grants Commission and Ministry of Human Resource Development, Government of India.

## Inaugural Function

The three-day symposium was inaugurated on 13<sup>th</sup> December 2023 by Dr. Manu Korulla, Outstanding Scientist and Director, Directorate of Management Services (DMS) as well as Directorate of Civil Works & Estates (DCW&E) at the Auditorium, Department of Electronics, CUSAT Main Campus in a function presided over by Dr. P. G. Sankaran, Vice-Chancellor, Cochin University of Science and Technology. Dr. Deepti Das Krishna, Head of the Department, welcomed the gathering. Dr. Supriya M. H., Chairperson, SYMPOL 2023, provided an overview of the previous SYMPOL conferences and Arun A. Balakrishnan, Coordinator, SYMPOL 2023 proposed the vote of thanks.



Dr. Manu Korulla, inaugurates SYMPOL 2023 by lighting the lamp. Vice Chancellor Dr. P. G. Sankaran, Dr. Supriya M. H., Dr. Ananya Sen Gupta, Dr. Deepti Das Krishna and Mr. Arun A. Balakrishnan are also seen.



Release of Proceedings of SYMPOL 2023 by Dr. Ananya Sen Gupta, Professor, University of IOWA, USA.

## Technical Program

The technical program of SYMPOL 2023 commenced with a keynote addresses on “Sea Systems and Innovative Underwater Technology Transformations” by Dr. Manu Korulla and “Interpreting Geometric Concepts into Underwater Acoustic Feature Representations: Case Studies and Challenges” by Dr. Ananya Sen Gupta, Professor, University of IOWA, USA. The keynote addresses were followed by an invited talk on “Thermal Performance Characteristics of Electronic Components: A Computational Fluid Dynamics based Approach” by Dr. Favas T. K., Department of Ship Technology, Cochin University of Science & Technology. Dr. Gopu R. Potty, Professor, Department of Ocean Engineering, University of Rhode Island, USA delivered a talk on “Listening to the heartbeat of oceans of the world: latest trends”. Mr. Jineesh George, Group Head, Transducers Group, Naval Physical and Oceanographic Laboratory, Kochi delivered a talk on “Piezoelectric Transducers for Underwater Acoustics Applications”. Another invited talk was delivered by Dr. D. D. Ebenezer, Adjunct Faculty, Department of Ship Technology, Cochin University of Science & Technology on “Propeller Radiated Noise”.







Keynote address by Dr. Manu Korulla (top) and Dr. Ananya Sen Gupta (bottom)



Invited talk by Dr. Gopu R. Potty, Professor, Department of Ocean Engineering, University of Rhode Island, USA



Invited talk by Dr. Favas T. K., Department of Ship Technology, Cochin University of Science & Technology.



Invited talks by Mr. Jineesh George, Group Head, Transducers Group, Naval Physical and Oceanographic Laboratory, Kochi



Invited talks by Dr. D. D. Ebenezer, Adjunct Faculty, Department of Ship Technology, Cochin University of Science & Technology

Out of the 25 manuscripts submitted for evaluation, 16 papers were accepted for oral presentation and all 16 of them were eventually presented. These presentations were organized in the following technical sessions covering a broad-spectrum of topics of interest to the SYMPOL community.

- Ocean Acoustics
- Artificial Intelligence for Ocean Exploration
- Signal Processing
- Navigation, Communication, Instrumentation & Localization

While the research sessions of SYMPOL spanned two days, the third day was dedicated for a workshop entitled “Advanced Communication Technologies”, conducted by Department of Telecommunications, India.



*Delegate receiving presentation certificate from the session chairs.*



*Talk on Advanced Communication Technologies by Shri. S. Gopalan, DDG (Compliance), DoT, Ernakulam.*

## **Announcement**

The eighteenth biennial Symposium on Ocean Technology (SYMPOL 2025) is scheduled to be held in the Department of Electronics of the Cochin University of Science and Technology, Kochi during 10-12 December 2025.