**Training on**

# *"Micro and nanoplastic Analysis of Environmental and Industrial Samples: Sampling, Processing and Identification"*

20th to 24th July (5 days)

Venue: Department of Earth Sciences, Environmental Nanoscience Laboratory, IISER Kolkata

**Scope of the training:**

This workshop provides a platform to explore the emerging field of micro- and nanoplastic analysis, with a focus on environmental and industrial samples. Participants will learn modern approaches for sampling, processing, and identification, following nationally and internationally accepted protocols. The program includes hands-on demonstrations with advanced tools such as micro-Raman, Pyrolysis-GCMS etc. Alongside technical training, the workshop emphasises the environmental and health implications of microplastics, promoting responsible plastic use, sustainable practices, and effective communication of scientific findings to broader communities.

**Program Overview:**

This workshop provides a unique and engaging platform for participants to explore the rapidly growing field of micro- and nanoplastic analysis. Bringing together students, researchers, faculty members, and industry professionals, the program encourages collaborative learning and hands-on experience, bridging scientific knowledge with real-world environmental and industrial challenges.

Participants will gain practical training in modern techniques for sampling micro- and nanoplastics from a variety of environmental (water, soil, air, food) and industrial samples. The program also emphasises accurate identification methods, teaching participants how to recognise and classify microplastics effectively, while linking laboratory observations to broader environmental contexts.

In addition, the workshop introduces advanced analytical and characterisation technologies, such as micro-Raman and Pyrolysis GC-MS, and other state-of-the-art tools, for detailed analysis and quantification of micro- and nanoplastics. Alongside technical training, participants will explore the environmental and societal implications of plastic pollution, sustainable waste management practices, and circular

economy approaches, enabling them to translate scientific insights into actionable solutions. The workshop will be conducted offline at the Department of Earth Sciences, Indian Institute of Science Education and Research (IISER) Kolkata, offering face-to-face interactions, hands-on demonstrations, and collaborative learning experiences. The registration fee is Rs. 5000/- for participants from academia and Rs. 15,000 for industry participants (excluding 18% GST). A maximum of 30 participants will be selected strictly in the order of application submission, ensuring focused training and personalised engagement. All applicants must complete the registration form, and participants who attend at least 80% of the sessions will receive a course completion certificate. Through its integrated approach, this workshop aims to build technical expertise, foster scientific awareness, and promote informed perspectives on the environmental implications of microplastics.

**Course Objectives**

1. To analyse microplastics in diverse environmental and industrial samples, including water, soil, air, seafood (fish, crab, shrimp, etc.), pharmaceuticals, biomedical products, and packaged food items.
2. To gain a comprehensive understanding of processing methods adopted under Indian Standard protocols for microplastic analysis.
3. To explore emerging technologies used for the estimation and characterisation of micro and nanoplastics.
4. To provide hands-on experience with advanced analytical tools, such as FTIR-ATR, Micro-Raman, Py-GCMS, stereo microscope, nanoparticle tracking analyser, scanning electron microscope and atomic force microscopy, ICP-MS/OES, TOC analyser, CHNS analyser, HPLC and other state-of-the-art technologies used for the detection and identification of micro and nanoplastics.
5. To promote public understanding of their environmental and health impacts, thereby encouraging responsible plastic use and recycling practices.

**Learning Outcomes**

After completing this workshop, participants will be able to:

- Confidently work with modern analytical tools and techniques used for the detection, characterisation, and quantification of micro and nanoplastics across different sample types.
- Identify key challenges associated with microplastic pollution and suggest practical, scientifically informed strategies to address these issues in environmental and industrial contexts.

- Interpret and compare different processing and analytical protocols, including methods outlined in Indian Standard guidelines, to ensure reliable and consistent micro and nanoplastics analysis.
- Effectively communicate scientific insights on micro and nanoplastics to support public awareness, promote responsible plastic use, and encourage detailed quantification techniques and recycling practices.

**Eligibility to participate:** Working Professionals, Faculty Members, Researchers, Students at all levels (Undergraduate / Postgraduate / PhD) interested in learning about Microplastics Analysis can participate.

**Registration: Rs. 5000/- for participants from academia and Rs. 15000 + 18% of GST for industry personnel**
All the participants need to fill up and submit a form given at the portal (to be given soon).

**About Indian Institute of Science Education and Research, Kolkata**

The Indian Institute of Science Education and Research Kolkata (IISER Kolkata) was established in 2006 by the Ministry of Human Resource Development (now the Ministry of Education), Government of India. As an autonomous institute, it confers its own degrees, with a central mission to integrate education and research, fostering both undergraduate teaching and advanced research at the doctoral and postdoctoral levels in the basic sciences. Teaching and research have remained equally crucial in the institute's growth and success. Over its decade-plus journey, IISER-K has built a strong reputation for excellence in both science education and research, producing high-quality publications and graduating more than ten cohorts of students. Today, IISER-k alumni are contributing to leading international research institutes and companies worldwide.

**About Environmental Nano Science Laboratory:**

Our lab specialises in the study of micro and nanoplastic pollution and its environmental impacts. With extensive experience in advanced sampling, identification, and characterisation techniques, we bring practical insights into the analysis of both environmental and industrial samples. The lab has a strong track record in training students, researchers, and professionals in analytical and laboratory methods, including the use of cutting-edge tools such as micro-Raman and other advanced spectroscopic techniques. We emphasise connecting scientific research to actionable solutions for sustainable waste management, fostering awareness of the societal and ecological impacts of microplastics.

Through a structured approach that combines theoretical knowledge with hands-on practice, our lab is uniquely positioned to deliver a high-quality, impactful workshop that equips participants with the skills and understanding needed to address the growing challenge of plastic pollution.

**Accommodation:** Please note that the registration fee doesn't include accommodation.
Note: ***Accommodation charges per person per day: Rs 840 (with 18% GST) (Sharing twin room)***

**Course Coordinators:**

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