

# 14th Summer School in Tribology



June 14-18, 2022  
(In Hybrid Mode)

Organizer



Supported by:



Science and Engineering Research Board  
(a statutory body of the Department of Science & Technology,  
Government of India)

## Objectives

Importance of Tribology for sustainable reliability cannot be over-emphasized. It has been reported that losses due to improper understanding and application of Tribology is estimated at over 1.4 % of GDP of the world and 8.7% of the total cost of energy production.

Tribological failures have been estimated to be responsible for about 40% of breakdowns in industries. Therefore, engineers working in the field need to have a thorough understanding of Tribological practices, so that proactive measures can be implemented in place of traditional corrective and breakdown maintenance practices. The potential of savings has been estimated to be about 15% in the short term and 40% in the long term of the losses due to friction and wear. This required sustained and focused efforts on part of everyone working in Academia and Industries.

The important subject of Tribology does not get appropriate coverage in the engineering curriculum in our country. Inadequate understanding about the principles and application of Tribology is one of the major reasons of failures in the industry, leading to poor productivity and higher material and energy losses. There is a strong need to promote the awareness of Tribology among our industries and academia. It is with this background that the Tribology Society of India (TSI) is organizing the "14<sup>th</sup> Summer School in Tribology" (SST) on a hybrid mode during 14<sup>th</sup> -18<sup>th</sup> June, 2022 (Tuesday-Saturday) to reinforce the need for continued education in Tribology - an interdisciplinary science and technology of friction, wear and lubrication. Some of the programs of Summer School in Tribology (SST) have been financially supported by SERB, Department of Science and Technology (DST), Govt. of India and various industries.

In view of continued COVID pandemic, like 13<sup>th</sup> Summer School in Tribology, the 14<sup>th</sup> Summer School in Tribology is also being organized in Hybrid mode from June 14-18, 2022 (Tuesday-Saturday).

Like earlier programs, 14<sup>th</sup> SST is intended to provide a platform for interaction between reputed tribologists of the country and the participants, comprising senior teaching professionals and practicing engineers/ professionals from Indian industry. The curriculum has a balanced combination of theoretical and applied aspects of Tribology and includes a session on assessment of learning (based on multiple choice questions) on the last day. To enable the participants to carry forward their learning beyond the program, each participant will be required to submit a mini project, within three months from the completion of the program, detailing the application of the leanings in some aspect of their own areas of work. Details will be provided during the program.

## Who should attend?

Faculty in Mechanical Engineering/Tribology from Academia, Research Scholars pursuing PhD / M. Tech in Tribology,

Practicing Engineers/Managers from Industry working in Plant Design, Operation & Maintenance, Technical Services, Marketing personnel of Lubricants/additives companies, Industrial R&D from sectors like Automotive, Railroad, Oil, Steel, Power, Cement, Engineering and Heavy Machinery etc.

## Topics to be covered

**Basics of Tribology:** Basics of Friction, Wear and Lubrication; Wear of Materials and Wear Modeling; Wear Mechanisms and Mitigation of Wear by Tribology based Designs.

**Lubrication:** Fluid Film Lubrication & Hydrodynamic Bearings; Lubricants-different types and their production; Chemistry of Lubricants and Additives; Automotive Tribology and Grease Rheology.

**Tribology of Machine Components:** Rolling Element Bearings; Gears; Failure Analysis of Tribo- Components.

**Applied Tribology:** Tribo-testing of Material & Lubricants; Analytical Techniques for Tribology and Surface Characterization; Condition Monitoring through Oil Analysis.

**Special Topics in Tribology:** Nano-mechanics/properties of materials at small scales; Bio Tribology; Application of NDT in Tribology; Tribology of Manufacturing Operations; Corrosion.

**Case studies by industry experts will also be presented during the program. We also propose to include guest lecturers from eminent tribologists from international academia & research institutions(details will be updated shortly on TSI website).**

## IMPORTANT INFORMATION

Venue: IIPM Gurugram/ Hybrid platform

Date: 14-18 June 2022 (Tuesday-Saturday)

## For participants from Academia:

### Category A : Participants applying for physical mode of participation:

- Faculty in Mechanical Engineering / Tribology and / or Research Scholars pursuing PhD / M. Tech in Tribology can **apply on line through the link given below by 13<sup>th</sup> May 2022 :**  
<http://tribologyindia.org/online-application-form14th%20SST.htm>
- No delegate fee for the program is required to be paid by the Academia Participants. Lodging and boarding will be provided **free of cost**. Selected participants will also be reimbursed to and fro travel cost, limited to II AC railway fare.
- The selected /short listed candidates will be informed by 17<sup>th</sup> May 2022.

- (d) Bonafide certificate from Head of Institution / Department is required for the selected candidates.
- (e) In addition the selected participants from academia will also be required to submit a Cheque of Rs 5000/- as an interest free deposit, which will be refunded back to the participant upon successful completion of the programme. In case of non participation without a prior notice of 15 days before the start of the program, this amount will be encashed by TSI to cover the administrative expenses incurred.
- (f) **Academia candidates who have already attended earlier SST programs in physical mode need not apply.**

### **Category B: Participants applying for virtual mode of participation:**

- (a) Academia participants desirous of participation in 14<sup>th</sup> SST in virtual mode need to apply at the link given below. **Last date for applying on line for academia persons for virtual mode is 13<sup>th</sup> May 2022.**

<http://tribologyindia.org/online-application-form14th%20SST.htm>

For academia participants desirous of participation in 14<sup>th</sup> SST, physical mode (Category A) or virtual mode (Category B) TSI membership is mandatory. Those who are not members of TSI can apply on line for TSI membership at the link below:

[http://www.tribologyindia.org/become\\_a\\_member.htm](http://www.tribologyindia.org/become_a_member.htm)

### **For participants from Industry:**

**1. Non Residential Category: Course Fee for participants from Industry without accommodation\*:** A course fee of Rs 40000/- plus GST as applicable currently @18%. The course fee will cover the TSI program fee, course material plus day boarding and beverages for five days at IIPM, Gurugram.

**2. Residential Category : Course Fee for participants from Industry with a twin sharing accommodation at IIPM Gurugram:** Rs 55000 + GST as applicable (currently@18%) : This course fee will cover the TSI program fee, course material plus twin sharing accommodation for five days at IIPM, Gurugram. For Industry delegates, please make programme fee payment by cheque / DD / online bank transfer favoring 'Tribology Society of India' payable at IOC Complex, Faridabad

**3. Virtual Mode for Foreign Participants:** A course fee of USD 100.00 plus 18% GST.

### **Format of Registration Form for Industry Participants**

Name of Participant.....  
 Organization.....  
 Designation.....  
 Contact Address.....  
 Email ID.....  
 Mobile No.....  
 Signature of Sponsoring Authority .....  
 Name.....  
 Designation.....

Payment of Registration fee for Industry Participation is to be made along with the Registration form at the address given below.

**Mr. Rahul B Meshram**  
**Research Manager (Tribology) and Treasurer TSI**  
**C/o Indian Oil Corporation Limited,**  
**Research & Development Centre,**  
**Sector -13, Faridabad -121 007, Haryana, India.**  
 Phone: 0129-2294 217, / 322/ 680  
 Email: [info@tribologyindia.org](mailto:info@tribologyindia.org)

**Payments can also be deposited directly in the Account of TSI as per details given below:**

A/c Name: **Tribology Society of India**  
 Current Account Number No.: **31710524711**  
 IFSC / NEFT Code: **SBIN0010449**  
 MICR No.: **110002466**  
 SWIFT CODE: **SBININBB383**  
 Bank's Name & Address: **State Bank of India, IOC Complex Branch, Sector 13, Faridabad - 121007, Haryana, India**

**About the organizers :** To provide a common umbrella to work further in this important area of Tribology, Tribology society of India (TSI) was set up as a professional, nonprofit body bringing together academicians, and industry as well as research organizations as its members. It was set up in its present form in June 1989, with its headquarters at Bharat Heavy Electricals Limited, Corporate R&D at Hyderabad. Subsequently the headquarters was shifted to its current one at Indian Oil R&D Centre, Faridabad. This society is affiliated to the International Tribology Council, UK which has 39 other national societies as members across the world.

Tribology Society of India (TSI) organizes the Summer School in Tribology to provide a platform to academicians, practicing engineers and R&D professionals for sharing their knowledge and experiences in this field. It enables Tribology faculty and research scholars to expand the Tribology curriculum at their

organizations. TSI is engaged in a variety of initiatives such as IndiaTrib and TRIBOINDIA conferences to promote Tribology in India. The Society has Members from Oil & Gas, Power, Steel, Cement, R&Ds and academia from all over the country. For more information please visit our website [www.tribologyindia.org](http://www.tribologyindia.org)

### **The likely Speakers for Technical Sessions are listed below**

- Prof. Satish V Kailas, Indian Institute of Science, Bangalore
- Mr Anjeeve George, Danfoss Technologies Pvt. Ltd., Pune
- Dr. B Venkataramanan, Defence Metallurgical Research Labs, Hyderabad
- Prof. Ram Turaga, Indian Institute of Science, Bangalore
- Prof. Satish C Sharma, Indian Institute of Technology Roorkee
- Prof Sujeet Kumar Sinha, Indian Institute of Technology Delhi, New Delhi
- Prof. M S Bobji, Indian Institute of Science, Bangalore
- Prof. A P Harsha, Indian Institute of Technology, BHU, Varanasi
- Prof. Mayank Tiwari, Indian Institute of Technology Patna
- Dr. Barun Chakrabarti, L&T Hydrocarbon Engg, Mumbai
- Dr. C Kannan, Indian Oil Corporation (R&D), Faridabad
- Mr. Ajay Kumar Harinarain, Indian Oil Corporation (R&D), Faridabad
- Dr. N K Pokhriyal, Indian Oil Corporation (R&D), Faridabad
- Mr. Kamal Mukherjee, Former GM, Coal India Limited, Bilaspur
- Prof Krishnan Balasubramanian, Indian Institute of Technology, Chennai
- Mr. P Pathak, RDCIS Steel Authority of India Ltd, Ranchi
- Dr T Singh, Bharat Petroleum Corporation Ltd, Mumbai
- Dr Nityanand Goswami, Indian Institute of Technology , Delhi

### **(For any information please contact)**

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**Research Manager (Tribology) and Treasurer TSI**  
**C/o IndianOil R&D Centre, Sector-13, Faridabad**  
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