

15th Summer School in Tribology



13-17 June, 2023

at

Department of Mechanical Engineering,
Indian Institute of Science Bangalore
(IISc Bangalore)

CV Raman Road, Bengaluru, Karnataka – 560 012, India

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 are 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 requires 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.

The Program

It is with this background that the Tribology Society of India (TSI) is organizing the “15th Summer School in Tribology” (SST) during 13th -17th June, 2023 (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, (a statutory body of the Department of Science & Technology) Govt. of India and various industries.

Like earlier programs, 15th 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.

The program intends to provide opportunities to participants for interacting with leading OEMs of Tribo Equipment through

product demo sessions, conducted visits to facilities and technical talks by the manufacturers.

Who should attend?

- Faculty in Mechanical Engineering teaching tribology or machine design and research scholars pursuing PhD in Tribology (limited to maximum 10 research scholars).
- 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: *Department of Mechanical Engineering, Indian Institute of Science Bangalore, CV Raman Road, Bengaluru, Karnataka – 560 012, India*

Date: **13-17 June, 2023 (Tuesday-Saturday)**

• For participants from Academia:

- (A) 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.

- (B) Faculty in Mechanical Engineering teaching tribology or machine design and Research Scholars pursuing Ph.D in Tribology may **apply on line through the link given below by 7th April 2023**
<https://www.tribologyindia.org/online-application-form.html>
- (C) The selected /short listed candidates will be informed by **14th April, 2023**. All academia participants selected will be required to take TSI membership.
- (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 during 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 need not apply.**

For academia participants desirous of participation in 15th SST, 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

• For participants from Industry:

1. Non Residential Category: Course Fee for participants from Industry without accommodation: **A course fee of Rs 35000/- inclusive of GST** (currently @18%) The course fee will cover the TSI program fee, course material plus beverages for five days at IISc Bangalore, during the program.

2. Residential Category: **A course fee of Rs. 45000/- inclusive of GST and accommodation on twin-sharing basis for 6 days at IISc's Centenary Visitors House (CVH)** will be payable by Industry participants choosing to stay in IISc campus during the program. The course fee will cover the TSI program fee, course material plus food & beverages for five days at IISc Bangalore, during the program.

Participants can obtain proper invoices for all payments made for fees and services, if required by them.

Format of Registration Form for Industry Participants

Name of Participant.....
 Organization.....
 Designation.....
 Contact Address.....
 Email ID.....

Mobile No.....

Signature of Sponsoring Authority

Name.....

Designation.....

Registration Form Link for Industry participants:

<https://www.tribologyindia.org/pdf/registration-form-for-industries-participants.docx>

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

Sr. 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

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

TSI GST No.: 06AACAT3031B126

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 were 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

About the Indian Institute of Science Bangalore (link): <https://iisc.ac.in/about/foreword-from-the-director/>

The likely Speakers for Technical Sessions are listed below

- ☐ Prof. Satish V Kailas, Indian Institute of Science, Bangalore
- ☐ Dr. Kavita Rai, IndianOil (R&D Centre), Faridabad
- ☐ Prof. Satish C Sharma, Indian Institute of Technology Roorkee
- ☐ Mr. Ajay Kumar Harinarain, Indian Oil Corporation (R&D), Faridabad
- ☐ Prof. M F Wani, NIT Srinagar, Jammu & Kashmir
- ☐ Mr Anjeev George, Danfoss Technologies Pvt. Ltd., Pune
- ☐ Dr. P. Ramkumar, IIT Madras
- ☐ Prof. M S Bobji, IISc, Bangalore, Bengaluru
- ☐ Prof. Mayank Tiwari, IIT Patna
- ☐ Prof. B Venkataraman, DMRL, Hyderabad
- ☐ Dr. Barun Chakrabarti, Formerly of Larsen & Toubro Limited, Mumbai
- ☐ Dr. N K Pokhriyal, IndianOil (R&D Centre), Faridabad
- ☐ Mr. Kamal Mukherjee, Former GM, Coal India Limited, Bilaspur
- ☐ Prof Krishnan Balasubramanian, Indian Institute of Technology Madras, Chennai
- ☐ Mr. P Pathak, RDCIS Steel Authority of India Ltd, Ranchi
- ☐ Dr. T Singh, Bharat Petroleum Corporation Ltd, Mumbai
- ☐ Dr Nityanand Gosvami, IIT Delhi, New Delhi
- ☐ Dr. Gopakumar Parameswaran, 3M India Ltd, Bangalore
- ☐ Dr. Anand Prabhakaran, TATA Steel, Jamshedpur
- ☐ Dr. Kartik Pondicherry, Anton-Paar, Hyderabad
- ☐ Dr. S. Juttu, ARAI, Pune
- ☐ Dr. Geetha Manivasagam, VIT- Vellore
- ☐ Dr. J Christopher, IndianOil (R&D Centre), Faridabad
- ☐ Prof. Harpreet Singh, IIT Ropar
- ☐ Mr. Hari Dudhankar, Schaeffler
- ☐ Prof. B V Manoj Kumar, IIT Roorkee
- ☐ Prof. A P Harsha, IIT BHU, Varanasi
- ☐ Mr K. Venkatesh, Hindalco Industries, Mumbai