

## About the organizers

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

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

## Venue

Indian Oil Institute of Petroleum Management (IIPM) is a fully integrated residential campus for education and training, developed by Indian Oil Corporation Limited (IOCL) as a state-of-the-art resource for in-house programs. The academic block is equipped with classrooms and lecture halls, having latest facilities including audio-visual systems as well as a state of the art Reference Library with more than 15000 Books and Journals. The residential block is furnished with modern amenities and has in-house dining arrangement. The venue also offers recreational facilities for the participants including Swimming Pool, Gym and Walking Track etc.

## Some of the likely Speakers for Technical Sessions are listed below

- Prof. Satish V Kailas, Indian Institute of Science, Bangalore
- Dr. Deepak Saxena, Indian Oil Corporation (R&D), Faridabad
- Prof. Ram Turaga, Indian Institute of Science, Bangalore
- Prof. Satish C Sharma, Indian Institute of Technology , Roorkee
- Prof. M S Bobji, Indian Institute of Science, Bangalore
- Prof. AP Harsha, Indian Institute of Technology, BHU, Varanasi
- Prof. C S Ramesh, Alliance University, Bangalore
- Mr. S R Durugkar, L&T Hydrocarbon Engg, Mumbai
- Dr. Barun Chakrabarti, L&T Hydrocarbon Engg, Mumbai
- Dr. Reji Mathai, Indian Oil Corporation (R&D), Faridabad
- Dr. N K Pokhriyal, Indian Oil Corporation (R&D), Faridabad
- Mr. Ajay Kumar Harinarain, Indian Oil Corporation (R&D), Faridabad
- Mr. R Mahapatra, Indian Oil Corporation (R&D), Faridabad
- Mr. SPRS Negi, Schaeffler India, Vadodara
- Mr. Kamal Mukherjee, Former GM , SECL, Bilaspur
- Mr. Deepak Sharma, Kittiwake Proactive Tech. P Ltd, New Delhi

- Prof. V S Raja , Indian Institute of Technology, Bombay
- Mr. Vishwanathan V., L&T Hydrocarbon Engg, Mumbai
- Dr. Anand Prabhakaran, Tata Steel, Jamshedpur
- Mr. P Pathak, RDCIS Steel Authority of India Ltd, Ranchi

### For any information please contact :

Mr. Rajendra Mahapatra

Treasurer TSI

C/o Indian Oil Corporation Limited,

Research & Development Centre,

Sector - 13 , Faridabad. Pin Code -121 007,

Haryana, India.

Email : [info@tribologyindia.org](mailto:info@tribologyindia.org)

# 9<sup>th</sup> Summer School in Tribology



## 19-23 June, 2017

at

Indian Oil Institute of Petroleum Management (IIPM)  
Gurgaon

## Organizers



## 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 1.5 % of GDP of the developed countries, and this loss percentage may be even more in developing countries like India. We can well imagine the state of affairs in our country where awareness about importance, understanding and application of Tribology is rather low. 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 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 "9th Summer School in Tribology" during June 19-23, 2017 at IIPM, Gurgaon, to reinforce the need for continued education in Tribology - an interdisciplinary science and technology of friction, wear and lubrication.

All past programmes of Summer School in Tribology (SST) have been financially supported by SERB, Department of Science and Technology (DST), Govt. of India and various industries.

The program is intended to provide a platform for interaction between reputed tribologists of the country and the participants, comprising senior teaching professionals and practising engineers/professionals from Indian industry.

There will be an Objective Type (multiple choice questions) Test on the last day based on the topics covered during the program. Details will be provided during the program.

A mini project detailing the application of the learnings during the course in the participant's work area will be required to be submitted within three months of completion of the programme by all participation.

### Who should attend?

Faculty in Mechanical Engineering/Tribology from Academia, Research Scholars pursuing PhD / M. Tech in Tribology Practising Engineers/Managers from Industry working in Plant Maintenance, Technical Services, Marketers of Lubricants/additives and 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 & Tribology.

Case studies by industry experts will also be covered during the programme.

### Important information

**Venue:** IndianOil Institute of Petroleum Management (IIPM)

83, Institutional Area, Sector-18, Gurgaon

Date: 19-23 June, 2017

### For participants from Academia:

- Bonafide certificate from Head of Institution / Department is required to be submitted along with application for the course.
- 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.
- 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 20th Apr 2017 :**  
<http://www.tribologyindia.org/online-application-form.htm>
- The selected /short listed candidates will be informed by 30<sup>th</sup> Apr 17. Other things being equal, preference will be given to TSI Members.
- 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.
- Academia candidates who have attended earlier SST programmes need not apply.

## For participants from Industry :

- Non Residential Category : Course Fee for participants from Industry without accommodation\* :** A course fee of Rs 40000/- plus service tax as applicable currently @15%. The course fee will cover the TSI program fee, course material plus day boarding and beverages for five days at IIPM, Gurgaon.
- Residential Category : Course Fee for participants from Industry with a twin sharing accommodation at IIPM Gurgaon :** Rs 55000+ as applicable service tax (currently @ 15%) : This course fee will cover the TSI program fee, course material plus twin sharing accommodation for five days at IIPM, Gurgaon.

For Industry delegates, please make program fee payment by cheque / DD / online bank transfer favoring 'Tribology Society of India' payable at Faridabad for the fee payment.

### Registration form for Industry Participants

Name of Participant.....

Date of Birth.....

Organization.....

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Designation.....

Contact Address .....

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Email ID .....

Mobile No .....

Signature of Sponsoring Authority / HOD \*\* .....

Name.....

Designation.....

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

Mr. Rajendra Mahapatra

Senior Research Manager ( Tribology ) , and Treasurer TSI

C/o Indian Oil Corporation Limited,

Research & Development Centre,

Sector -13 , Faridabad. Pin Code -121 007,

Haryana, India.

Phone +91 129 2294322

[info@tribologyindia.org](mailto:info@tribologyindia.org)

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

A/c Name	<b>Tribology Society of India</b>
Current Account Number No. :	<b>31710524711</b>
IFSC / NEFT Code:	<b>SBI N 0010449</b>
SWIFT Code :	<b>SBININBB381</b>
MICR No :	<b>110002466</b>
Bank's Name & Address :	<b>State Bank of India, IOC Complex Branch, Sector 13, Faridabad - 121007, Haryana, India</b>