

## About the organizers

Tribology is the interdisciplinary science and technology of interacting surfaces in relative motion involving studies in the area of friction, wear and lubrication. Tribology Society of India, (TSI), IndianOil Institute of Petroleum Management (IIPM), Gurgaon and Indian Oil Corporation, R&D Centre, Faridabad have joined hands together To organize the Summer School in Tribology. Over past five years, the Summer Schools have been providing a platform to academicians, practicing engineers and R&D professionals for sharing their knowledge and experiences in this field.

**Tribology Society of India (TSI)** has its secretariat at IndianOil R&D Centre, Faridabad and 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.

### Indian Oil Corporation Limited (IndianOil)

Indian Oil Corporation Ltd. is India's largest company by sales with a turnover of Rs. 4,14,909 crore and profit of Rs 5,005 crore for the year 2012-13.

IndianOil is the highest ranked Indian company in the latest Fortune 'Global 500' listings, ranked at the 88th position. IndianOil's vision is driven by a group of dynamic leaders who have made it a name to reckon with.

Its world-class R&D Centre has won recognition for its pioneering work in lubricant formulations, refinery processes, pipeline transportation and alternative fuels. To seek growth beyond traditional areas of competence, Indian Oil's business development efforts are now focused on vertical integration – both upwards into Oil exploration & production and downward into petrochemicals – besides diversification into gas marketing and globalization of downstream operations.

### 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

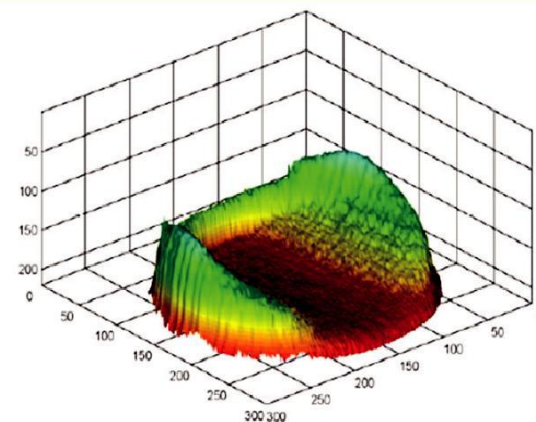
Journals. The residential block is furnished with modern amenities and has in-house dining arrangement. The venue also offers recreational facilities for the participants including Swimming Pool [Please carry formal Swimming Costume], Gym and Walking Track etc.

### For further information, please contact

#### Mr. A.K. Mehta

Executive Director -TSI  
C/o IOCL, R&D Centre, Sector 13  
Faridabad – 121007 (Haryana)  
Phone +91 129 2294680  
Mobile +91 9811162579  
Email: - mehta.tsi@gmail.com  
info@tribologyindia.org

# 6th Summer School in Tribology



## 23-27 June 2014

at Indian Oil Institute of Petroleum Management, Gurgaon

### Organizers



## Objectives

Importance of Tribology for sustainable reliability cannot be over emphasized. It is reported that loss due to improper understanding and application of Tribology is over 1.5 % of GDP of the developed countries like the USA. 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 are responsible for over 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), the Indian Oil Institute of Petroleum Management, Gurgaon, and IndianOil R&D Centre are jointly organizing the “6th Summer School in Tribology” during June 23 - 27, 2014 at IIPM, Gurgaon, to reinforce the need for continued education in Tribology - an interdisciplinary science and technology of friction, wear and lubrication.

The program is intended to provide a National Platform for interaction between renowned Tribologists of the country and the Participants, comprising senior teaching professionals and practising engineers from Indian industry.

The program will include a one-day visit to IOCL R&D Centre, Faridabad.

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.

## Who should attend

- Faculty in Mechanical Engineering / Tribology from Academia, Research Scholars pursuing PhD / M. Tech in Tribology (limited to maximum 10 research scholars)
- Practicing 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.

**There will be a visit to Tribology-related laboratories at IndianOil R&D Centre, Faridabad.**

## Important information

**Venue: IndianOil Institute of Petroleum Management (IIPM)**  
83, Institutional Area, Sector-18, Gurgaon

**Date: 23<sup>th</sup> – 27<sup>th</sup> June 2014**

**Fees For participants from Academia:**

- (a) No delegate fee for the program will be charged from 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 fare.
- (b) Faculty in Mechanical Engineering / Tribology and / or Research Scholars pursuing PhD / M. Tech in Tribology can apply on line through the link given or by sending a soft of the Regn form by 15th Apr 2014.

The selected /short listed candidates will be informed by 20th Apr 14. Other things being equal, preference will be given to TSI Members.

- (c) Academia participants selected for the program will, however, be required to pay a nominal non refundable Regn Fee of Rs1,000/- to cover the cost of “kit bag” to be given to the participants. In addition the selected participants from academia will also be required to submit a refundable DD of Rs2500/-, which will be returned when they report for the program. In case of non participation without notice of 15 days before the start of the program, this amount will be encashed by TSI to cover the administrative expenses incurred.
- (d) Academia candidates who have attended earlier SSTs need not apply.

**For participants from Industry (Non- IOCL / Non Sponsor):**

- (a) Non Residential category: Course Fee for participants from Industry without accommodation\*: A course fee of Rs 22,500+ service tax @ 12.36 % (Rs25,281/-).The course fee will cover the TSI course fee, course material plus food and beverages for five days at IIPM, Gurgaon.
- (b) Residential Category : Course Fee for participants from Industry with accommodation\*: A course fee of Rs 37,500+ service tax @ 12.36 % (Rs42,135/-).The course fee will cover the TSI course fee, course material plus food and beverages and stay at IIPM for five days at IIPM, Gurgaon on twin sharing basis.

Please make cheque / DD favoring 'Tribology Society of India' payable at Faridabad.

## Registration form \*

Name of Participant.....  
Date of Birth.....Organization.....  
.....  
Designation.....  
Contact.....  
Address.....  
.....  
Email ID.....  
Mobile No. ....

Please attach your Bio Data and few lines on “why do you want to attend 6th SST event”.(Please attach soft file):

Signature of Sponsoring Authority / HOD \*\*

.....  
Name.....  
Designation.....

\*For on line application use the following link:  
<http://www.tribologyindia.org/online-application-form.htm>

\*\* Not mandatory for application.  
.Please do not send any payment along with application.  
Payment for Registration fee is to be made only after selection

Post this form along with the payment at the address given below.

**Dr. Pankaj Bhatnagar**

Chief Manager – Indian Oil (R&D) & Treasurer - TSI  
C/o IndianOil R&D Centre, Sector-13  
Faridabad – 121007 (Haryana)

Phone +91 129 2299110 /2294442

Mobile +91 98685 18189

Fax +91 1292286221

bhatnagarp@indianoil.in

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