

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), Indian Institute of Science (IISc), Bangalore and Indian Oil Corporation, R&D Centre, Faridabad have joined hands together to organize the Summer School in Tribology. Over past seven 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. 4,50,756 crore and profit after tax of Rs 5,273 crore for the year 2014-15

IndianOil is the highest ranked Indian company in the latest Fortune 'Global 500' listings, ranked 119th 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, IndianOil'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.

Department of Mechanical Engineering, Indian Institute of Science, Bangalore

Mechanical Engineering activities at the Indian Institute of Science commenced prior to the Independence, in 1945, with the establishment of the Department of Internal Combustion Engineering.

Currently the department's faculty investigate a broad range of research in about a dozen thrust areas. Some of the specific areas include Computer-Aided Design and Manufacturing, Rapid Prototyping, Robotics and Controls, Turbo machinery and Combustion Systems, IC Engines, Multi-Phase flow, Heat and Mass transfer in Multiphase and Single phase systems, Fundamental Combustion, Bio-mechanics, Nano-mechanics, Tribology, Computational Fluid Dynamics, Optical

Diagnostics and Acoustics.

The Mechanical Engineering Faculty are continuing to explore new areas of research and develop new courses. Some of the areas in which the department faculty have ventured into are MEMS, Electronic Cooling, Energy, Bio-mechanics, Macro and Micro and Nano-mechanics. The Department is well equipped with state-of-the-art laboratories and infrastructural facilities in these areas. The Department receives funding from agencies such as UGC, MHRD, DST, ARDB, ISRO and other Government bodies and industries. Our faculty members render assistance to leading industries through technical advice and consultancy services.

Key Speakers for Technical Sessions New

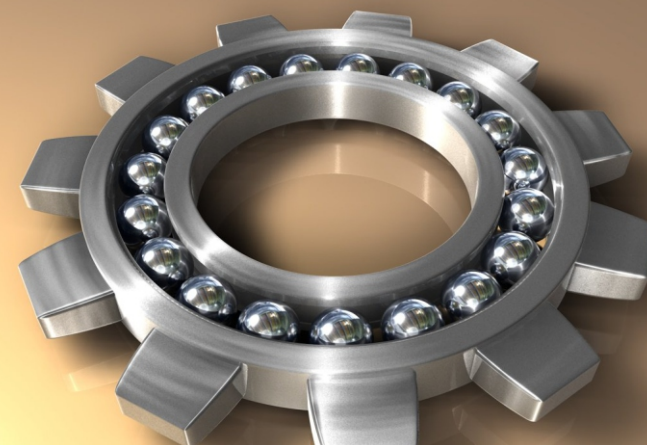
- Prof. Satish V Kailas, Indian Institute of Science, Bangalore
- Dr. S K Mazumdar, IndianOil (R&D), Faridabad
- Prof. Ram Turaga, Indian Institute of Science, Bangalore
- Prof. Satish C Sharma, Indian Institute of Technology, Roorkee
- Prof. M S Bobji, Indian Institute of Science, Bangalore
- Prof. 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
- Mr. Reji Mathai, IndianOil (R&D), Faridabad
- Dr. N K Pokhriyal, IndianOil (R&D), Faridabad
- Mr. Ajay Kumar Harinarain, IndianOil (R&D), Faridabad
- Mr. R Mahapatra, IndianOil (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

For further information, please contact

Mr. A.K. Mehta

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8th Summer School in Tribology



25-29 July 2016

at Indian Institute of Science
Bangalore

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), Department of Mechanical Engineering, Indian Institute of Science Bangalore and Indian Oil R&D Centre are jointly organizing the “8th Summer School in Tribology” during July 25 -29, 2016 at IISc, Bangalore, to reinforce the need for continued education in Tribology - an interdisciplinary science and technology of friction, wear and lubrication.

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

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 practicing engineers from Indian industry.

The program will include a one-day visit to a tribology intensive industry at Bengaluru

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 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 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; Surface Characterization in Tribology; Surface Modification for Improved Tribological Characteristics.

Lubrication : Basics of Fluid Film Lubrication & Hydrodynamic Bearings; Lubricants—Chemistry of Base Oils, Additives and Formulated Lubricants; Tribology and Rheology of Lubricating Greases.

Tribology of Machine Components : Rolling Element Bearings; Gear Engineering and Lubrication Tribology of Machine Elements.

Applied Tribology : Tribo-testing and Performance Evaluation of Lubricants and Materials; Automotive Tribology; Tribology of Hydraulic Pumps and Compressors; Tribology in Manufacturing Operations; Non Destructive Testing in Tribology; Condition Monitoring and Diagnostics of Tribo-Components; Condition Monitoring through Oil Analysis; Role of Corrosion in Tribology.

Special Topics in Tribology : Nano –Tribology; Bio Tribology; Space Tribology / Tribology of Extreme Environments

There will be a visit to Tribology-related laboratories at Indian Institute of Science, Bangalore .

Important Information

Venue :

Deptt. Of Mechanical Engineering, (IISc) Bangalore

Date: 25 -29 July 2016

For participants from Academia:

(a) No delegate fee for the program will be charged from the Academia Participants. Lodging and day boarding will be provided free of cost. Selected participants will also be reimbursed to and fro travel cost, limited to IIAC fare.

(b) Faculty in Mechanical Engineering teaching tribology or machine design and Research Scholars pursuing PhD in Tribology may apply on line through the link given or by sending a soft copy of the registration form given herewith by 30th of April 2016

The selected /short listed candidates will be informed by the middle of May 2016. All academia participants will be required to take TSI Membership.

© The selected participants from academia will be required to submit a cheque of Rs. 5000/- as refundable deposit amount along with the application form, which will be returned to them when they report for the program. In case of non participation in the program without giving a notice of 15 days prior to the start of the program, this amount of Rs. 5000/- will be encashed by TSI to cover the administrative expenses.

(d) Academia candidates who have attended earlier SSTs need not apply.

For participants from Industry

1. Non Residential category: Course Fee for participants from Industry without accommodation : A course fee of Rs.35,000/- plus applicable service tax @14.5% (Rs 5075), making the total fee for non-residential category as Rs. 40,075 (Rs. 35000 + Rs 5075 = **Rs. 40,075**) The course fee will cover the TSI program fee, course material plus day boarding and beverages for six days at IISc Bangalore.

2. Residential Category: Course Fee for participants from Industry with accommodation: A limited twin sharing hostel accommodation at IISc, Bangalore will be available for Rs 500/- per day per person (Rs.3,000/- for 6 days, as per IISc rates). A course fee of Rs 35,000 /- plus lodging on twin sharing bases at CVH Hostel @Rs 3000 per person for six days) plus applicable service tax @14.5% (Rs 35,000 + Rs 3000 = Rs. 38,000/-) + service tax @ 14.5% on Rs 38000 = Rs. 5510 making the fee to **Rs. 43,510/-** The course fee will cover TSI program fee, course material plus day boarding and beverages for six days at IISc, Bangalore.

However, all industry participants will be requested to stay at places of their choice near IISc campus in Bangalore City.

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

Registration form

(25 - 29 July 2016 at IISc Bangalore)

Name of Participant..... Date of Birth.....
Organization.....
Designation.....
Contact Address.....
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.

Dr. PANKAJ BHATNAGAR

C R M (MC & IP) & Treasurer TSI

C/o Indian Oil Corporation Limited,

Sector - 13, Faridabad. PIN Code -121007, Haryana, India.

info@tribologyindia.org

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

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