

# IndiaTrib-2022

December 12-14, 2022  
New Delhi, India

**Tribology for  
Energy, Environment and Society**

## Plenary Speakers



**Bhushan, Bharat**  
Academy Professor  
The Ohio State Univ., USA



**Bijwe, Jayashree**  
Professor, Indian Institute  
of Technology Delhi, India



**Carpick, Robert**  
Professor, Univ. of  
Pennsylvania, USA



**Erdemir, Ali**  
Professor, Texas  
A & M University, USA

**Third Announcement**  
**[www.indiatrib.org](http://www.indiatrib.org)**

**Organized by**



Indian Institute of Technology Delhi  
New Delhi

**Under the aegis of**



Tribology Society of India  
(Affiliated to the International Tribology Council, UK)

**Supported by**



Indian Society of  
Mechanical Engineers

Tribology is defined as the science and technology of interacting surfaces. It involves friction, wear, lubrication and many other surface related phenomena. Although the tribological problems and solutions have been the subject of human endeavor since the antiquity, the word tribology was first mentioned in a UK Government report in 1966 under the chairmanship of (Late) H Peter Jost. Many studies since then have clearly shown that there are huge economic losses incurred globally because of tribological issues. It is estimated that about 1.4% of the gross national product (GNP) of industrialized nations could be saved by paying attention to the losses due to tribological contacts and providing appropriate solutions. There will be even greater savings in the global energy and materials if friction in machines can be minimized and controlled. Efficient tribological solutions minimize air pollution and reduce the damages, often permanent, done to the aquatic wildlife. Together, it has tremendous potential to reduce the carbon footprint and save the global environment, thus contributing to the social capital of a country and the world.

With the aim of addressing the issues of tribological problems and their solutions, the Indian Institute of Technology Delhi (India) is organizing the international conference IndiaTrib-2022 under the aegis of the Tribology Society of India.

Tribology Society of India (TSI) is a premier professional society set up with a vision to spread awareness and practice of Tribology all across India. To fulfill this mission, the Society has been organizing International Conferences on Industrial Tribology biennially in different parts of the country, to enable the practitioners of tribology to discuss and showcase their work in various aspects of this multidisciplinary area.

### **About IndiaTrib-2022**

IndiaTrib-2022 is the upcoming mega tribology event in the series and will be the 11<sup>th</sup> International Conference on Industrial Tribology (ICIT) being organised by the Tribology Society of India since the year 1997 when the first International Conference on Industrial Tribology was organised at Kolkata. The last IndiaTrib conference was organized in 2019 at the Indian Institute of Science, Bangalore.

IndiaTrib-2022 is being organised by the Indian Institute of Technology Delhi (I.I.T. Delhi), during December 12-14, 2022 in Delhi, India's capital city. The theme of the conference is **“Tribology for Energy, Environment and Society”**.

## Keynote Speakers



**Adachi, Koshi**  
Professor  
Tohoku University  
Japan



**Dini, Daniele**  
Professor  
Imperial College London  
UK



**Kailas, Satish V.**  
Professor  
IISc, Bangalore  
India



**Ramakumar, SSV (Dr.)**  
Director (R&D) & Board Member  
Indian Oil Corporation Ltd.  
India



**Sasaki, Shinya**  
Professor  
Tokyo University of Science  
Japan



**Stack, Margaret**  
Professor  
University of Strathclyde  
UK



**Sugimura, Joichi**  
Professor  
Kyushu University  
Japan

## Invited Speakers



**Bobji, M. S.**  
Professor  
Indian Institute of Science  
Bangalore, India



**Egberts, Philip**  
Associate Professor  
University of Calgary  
Canada



**Emami, Nazanin**  
Professor  
Luleå University of  
Technology, Sweden



**Gnanamoorthy, R**  
Professor  
Indian Institute of  
Technology Madras, India



**Gnecco, Enrico**  
Professor  
Jagiellonian University,  
Poland



**Harsha, A P**  
Professor  
Indian Institute of  
Technology (BHU), India



**Hirayama, Tomoko**  
Professor  
Kyoto University  
Japan



**Jagota, Anand**  
Professor  
Lehigh University  
USA



**Kalin, Mitjan**  
Professor  
University of Ljubljana  
Slovenia



**Khatri, Om Prakash**  
Senior Principal Scientist &  
Professor, CSIR-Indian Institute  
of Petroleum, Dehradun, India



**Ruggiero, Alessandro**  
Professor  
University of Salerno  
Italy



**Sawae, Yoshinori**  
Professor  
Kyushu University  
Japan



**Sharma, Satish Chandra**  
Professor  
Indian Institute of Technology  
Roorkee, India

## Scope of IndiaTrib-2022

The focus of IndiaTrib-2022 are studies that are being conducted around the world in various disciplines which are all connected by the basic principles of tribology. The conference will highlight various innovative solutions and emerging technology trends in Tribology for improving life and productivity of machines and profitability to the Industry. The scope of the conference will include, but not limited to, the following topics:

- Tribology of Machine Elements
- Fundamentals of Friction
- Wear Mechanisms
- Surface Treatment & Coatings
- Adhesion, Contact Mechanics & Friction
- Lubrication, Lubricants & Additives
- Tribo-Testing
- Renewable Energy
- Wind Turbines
- Marine
- Automotive including Electrical Vehicles
- Space Applications
- Nuclear
- Nanotribology
- Bio-Tribology
- Tribology in Metalworking
- Tribology in Design & Manufacturing
- Tribology in maintenance of machinery
- Innovations in Tribology
- Tribology and Education
- Tribo-Corrosion
- Artificial Intelligence and Machine Learning applications to Tribology
- Tribological Materials
- Green Tribology
- Drag Reduction in Miniature Flying structures through Tribology
- Case studies related social impact of tribology
- Tribotronics

## Call for Oral and Poster Presentation

Engineers, scientists, academicians and practitioners in Tribology are invited to present technical papers in line with the theme of the Conference. Prospective contributors are requested to submit abstract of their papers in about 250 words latest by July 15, 2022 for review and selection. Further instructions on the format of the abstract will be provided on the conference website: [www.indiatrib.org](http://www.indiatrib.org)

If you would like to be included in the general mailing list of this conference then please send an e-mail to [secretariat@indiatrib.org](mailto:secretariat@indiatrib.org) so that we can send all the future updates about this conference to you.

Authors can submit extended abstract (optional) of their papers (up to 3 A4 size pages) latest by August 31, 2022. The guidelines for authors and template for the extended abstract and posters will be available for download from the conference website. All papers will be subjected to review by a Technical Committee and the decisions will be conveyed to the authors accordingly. Authors will retain the copyrights of the abstract submitted and it will be their responsibility to ensure that others copyrights are not infringed upon while submitting the abstracts.

## Publications

Full manuscript of the papers presented in this conference can be submitted to these journals for normal review and publication: Tribology Letters; Tribology International; Indian Journal of Tribology.

Alternatively, authors may choose to submit a paper (about 5-10 pages long in the template) to be published as a book. Selected papers (after review) from the conference will be published by Springer as a proceedings book volume. Springer will conduct quality checks on the accepted papers and only papers that pass these checks will be published.

You can choose to publish either in one of the journals or in the book. Same paper should not be submitted to both options.

## Important Dates

Receipt of Abstract	:	August 01, 2022
Acceptance of Abstract	:	Within two weeks of submission
Extended Abstract (3-pages)	:	August 31, 2022
Early Bird Registration	:	September 15, 2022



Following student awards will be given during this conference:

- ⦿ Best Oral Paper
- ⦿ Best Poster Paper
- ⦿ Runner-up Oral Paper
- ⦿ Runner-up Poster Paper

The papers will be selected for these awards by a committee and the decision of the committee will be final. The important evaluation criteria will be the quality of extended abstract, innovativeness of technical content, research importance, presentation layout/slides, presentation skills and time management. The presenters of the papers to be considered for award must be a student of an university/ institute at the time of presentation.

**Young Tribologist Award** (*Sponsored by Taiho Kogyo Tribology Research Foundation, TTRF, Japan*) (USD 500 equivalent in Indian Rupees to each awardee)

Five Young Tribologist awards for excellence in tribological research will be given during the conference. Selection will be made among registered presenters who satisfy the following criteria:

- ⦿ 36 years of age or below on 12 December 2022 (Date of birth should be 12 December 1986 or later)
- ⦿ Must not have received this TTRF award at any conference in the last five years
- ⦿ Must not belong to industry or for-profit organization

- ⦿ Must have registered for IndiaTrib-2022 with payment by 15 October 2022
- ⦿ Must submit Extended Abstract by the due date as mentioned on the conference website
- ⦿ Must apply for the award by submitting a filled form to the award selection committee (The form will be available soon through this website with submission instructions)

## Technical Exhibition

With a view to highlight the advancements made in the area of Tribology, it is planned to organize a Technical Exhibition along with the Conference. Lubricant & Additive Suppliers, Equipment Manufacturers, Tribology Specialists, Service Providers, Technical Book Publishers and related agencies are invited to participate in the Technical Exhibition to highlight their products and services. Exhibition space of about 3.0 m x 2.0 m will be provided to each Exhibitor. A fee of INR (₹) 90,000/- (USD (\$) 1,300) (including GST) will be charged for each exhibition stall, which will be provided with adequate furnishing and basic illumination facilities. Each Exhibitor will be entitled to send one complimentary delegate to attend the Conference.

## Business Meet

Manufacturers/suppliers of equipment, lubricants, additives and service providers related to Tribology are invited to the Conference to project their products, services and innovations through multimedia presentation in the special sessions called Business Meet. A fee of INR (₹) 70,000/- (USD (\$) 1,000) (including GST) will be charged for each presentation of 15 minutes duration. One complimentary delegate from each of the participating organizations in this session will be allowed to attend the Conference.

## Conference Registration Fees

The following Conference Registration Fees are payable by different categories of Delegates:

Category		TSI/ISME Member*		Non Member*	
		Regular	Early Bird <sup>#</sup>	Regular	Early Bird <sup>#</sup>
INDIAN DELEGATES	Industry & Industrial R&D	₹	₹ 17,500	₹ 16,500	₹ 20,000
	Academic (Faculty)		₹ 13,000	₹ 12,000	₹ 14,500
	Academic (Student) <sup>##</sup>		₹ 8,000	₹ 7,000	₹ 9,000
OVERSEAS DELEGATES	Overseas Delegate (Industry)	USD (\$)	\$ 700	\$ 640	\$ 760
	Overseas Delegate (Faculty)		\$ 590	\$ 530	\$ 650
	Overseas Delegate (Student) <sup>##</sup>		\$ 350	\$ 320	\$ 420

\* Includes GST; TSI-Tribology Society of India; ISME-Indian Society of Mechanical Engineers

<sup>#</sup> Early bird registration by September 15, 2022

<sup>##</sup> Student registration must be accompanied by a letter from supervisor/advisor or head of the department confirming student status at the start date of the conference.

Spouse registration at INR (₹) 7,000 (including GST) for Indian delegates and USD (\$) 180 (including GST) for International delegates (No conference kit included).

The Registration fees include:

- Technical Sessions and Cultural Evening
- Conference Proceedings in soft form
- Printed Materials
- Conference Kit
- Three Lunches, Tea/ Coffee
- Conference Banquet Dinner

### Cancellation Policy:

Cancellation should be made in writing (stating your name & registration no.) and send to [secretariat@indiatrib.org](mailto:secretariat@indiatrib.org)

### In case of cancellation:

On or before October 31, 2022 you will receive a refund of 50% of your registration fee less bank charges and administrative fee. No refund will be made for cancellation received after October 31, 2022

Registrations are accepted online only. Visit:

**[www.indiatrib.org](http://www.indiatrib.org)**

### Confirmation Letter

Registration confirmation letter will be sent to you via e-mail on receipt of the payment.

If the conference is postponed due to COVID-19 or similar reason with government orders then the registration fees already paid will be kept for the next dates when IndiaTrib will be organized

## Conference Sponsorship

The Conferences organised by TSI in the past have always received significant support from various industries. These include practically every industry sector like Oil & Gas, Steel, Mining, Chemicals, Power, Engineering and Allied Industries, both from India and abroad. The sponsors get wide publicity and networking opportunities as part of the Conference.

Reputed Companies, Organisations and Trade Associations are invited to join this International Event as Sponsors of the Conference. The details regarding various categories of sponsorship are given below.

Sponsorships	INR (₹)*	USD (\$)*	Free Delegates	Souvenir Ad. Full Page	Publicity	Technical Exhibition	Business Meet
Platinum	7,00,000	9000	5	Yes	Logo	Yes	Yes
Diamond	5,00,000	6,500	3	Yes	Logo	Select one	
Gold	3,00,000	4,000	2	Yes	Logo	Select one	
Silver	1,50,000	2,000	1	Yes	Logo		

\* Includes GST

## Advertisements

Souvenir, containing Book of Extended Abstracts, Conference details and informative articles, will be released during the Conference and will be provided to each registered delegate. Advertisements for the Souvenir can be booked at the following rates\*:

Category	INR (₹)*	USD (\$)*
Back Cover (Colour)	80,000	1,200
Inside (Front/ Back) colour	60,000	900
Colour Full Page	30,000	500
Black & White Full Page	20,000	300

The advertisement material is to be provided in a high-resolution, print-ready file.

\* Includes GST

*Fee for extra dinner ticket: Rs 3750 (including GST and subject to availability)*

## Payment Details

All payments related to Delegate Registration Fees, Industry Sponsorship, Advertisements, Technical Exhibition, Business Meet, Education Course Fee etc., are to be made through crossed demand draft / cheque payable at par, drawn in favor of "Tribology Society of India" payable at IOC Complex, Faridabad. Money can also be transferred directly to the Conference Account as given below (please send proof in case of direct transfer):

A/c Name:	Tribology Society of India
A/c No.:	31710524711
IFSC/NEFT:	SBIN0010449
Swift Code:	SBININBB383
MICR No.:	110002466
Bank Name:	State Bank of India
Branch Address:	IOC Complex Branch, Sector 13, Faridabad - 121007, INDIA
TSI GSTIN No.:	06AACAT3031B1Z6
TSI PAN No.:	AACAT3031B



**Tribology Society of India**

(Affiliated to the International Tribology Council, UK)



## About Tribology Society of India (TSI)

Tribology Society of India (TSI) was set up as a professional, non-profit body bringing together academicians, 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. The Society is currently operating at its registered office, C/o Indian Oil R&D Centre, Sector 13, Faridabad, since December 2010. TSI is affiliated to the International Tribology Council, UK which has 33 other national societies spread all over the world.

The activities related to tribology in the country started way back in 1972, when first World Conference on Industrial Tribology (WCIT) was organized by Indian Institute of Technology at New Delhi. Continuing with this, a series of National and International Conferences had been organized in the last 49 years. Besides there are a number of academic and industrial centers in India actively pursuing research related activities in this area.

## About I.I.T. Delhi

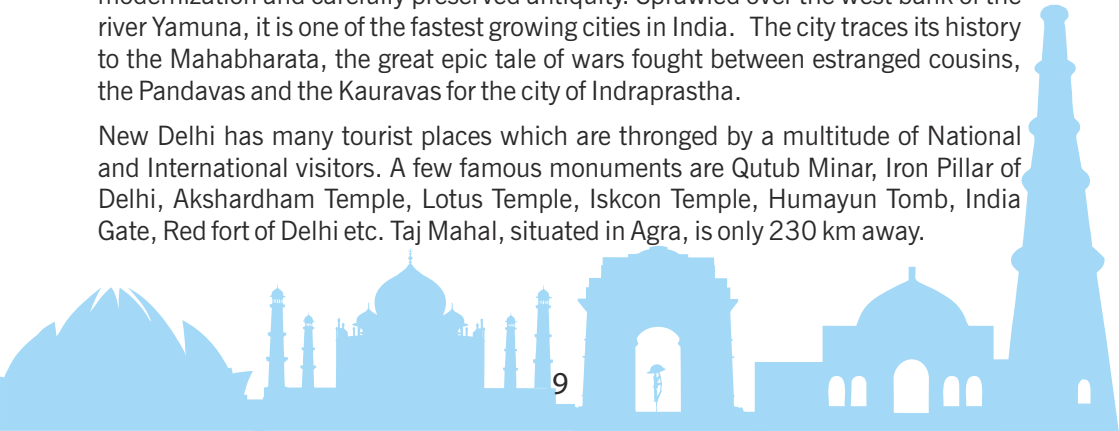
Established as College of Engineering in 1961, the Institute was later declared as an Institution of National Importance under the "Institutes of Technology (Amendment) Act, 1963" and was renamed as "Indian Institute of Technology Delhi".

Situated in Hauz Khas area of New Delhi, I.I.T. Delhi is primarily an engineering focused institution. Ranked among the top out of 23 I.I.Ts in the country, the Institute was declared as one of the ten public Institutes of Eminence by the Government of India for training, research and development in science, engineering and technology. It was ranked within the top 50 general universities in Asia in 2020 by the QS World University Rankings.

## About New Delhi

New Delhi, the capital of India, is a bustling metropolis that has an amazing mix of modernization and carefully preserved antiquity. Sprawled over the west bank of the river Yamuna, it is one of the fastest growing cities in India. The city traces its history to the Mahabharata, the great epic tale of wars fought between estranged cousins, the Pandavas and the Kauravas for the city of Indraprastha.

New Delhi has many tourist places which are thronged by a multitude of National and International visitors. A few famous monuments are Qutub Minar, Iron Pillar of Delhi, Akshardham Temple, Lotus Temple, Iskcon Temple, Humayun Tomb, India Gate, Red fort of Delhi etc. Taj Mahal, situated in Agra, is only 230 km away.



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## Conference Venue

# Eros Hotel

Nehru Place, New Delhi

Reach Venue from

- Indira Gandhi International Airport (IGIA), Delhi**  
22 kms (35 mins Drive)
- I.I.T. Delhi**  
8 kms (16 mins Drive)
- New Delhi Railway Station (NDLS)**  
13 kms (35 mins Drive)



## Access to Eros Hotel:

**By Taxi** - Taxis can be hired both from the airport and the railway station. Uber and Ola taxis can be called online. Pre-paid taxis are also available from such booths at the airport and the railway station.

**By Metro** - From the airport, take the Airport Express Line to New Delhi station – change to Yellow line going towards Huda City Centre – Change at Central Secretariat (3<sup>rd</sup> stop) to Violet Line going towards Badarpur, Faridabad – Get off at Nehru Place (7<sup>th</sup> stop). The hotel is about 5 mins walk from Nehru Place metro station.

From New Delhi Railway station, go towards Kashmere Gate exit – Cross the road and enter the Metro Station – Take the Yellow Line going towards Huda City Centre – Change at Central Secretariat (6<sup>th</sup> stop) to Violet Line going towards Badarpur, Faridabad – Get off at Nehru Place (7<sup>th</sup> stop).

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