



TSI NEWS LETTER

TSI Newsletter

JUNE 2013



| Message from President – Tribology Society of India |

Dear TSI Members,

I am pleased to reach out to all of you through this issue of TSI Newsletter. As you are aware, the new Executive Committee (2013 – 2014) of TSI took charge subsequent to the conclusion of ICIT-2012 event at Pune in December 2012. I would like to thank all of you for reposing your faith in the EC Members and would like to assure you that the new Committee will try its level best to meet your expectations. At the same time, I urge all of you to actively participate in various initiatives of the Society to take TSI to greater heights.



As you already know, our country has lost one of the greatest members of India's Tribologist community with the untimely demise of Prof. Sanjay K. Biswas in April 2013. He was one of the most gifted Tribology educators and researchers of our times and made immense contribution in taking Indian Tribology research to the world. He will be missed by hundreds of students, institutes and organizations, who benefited from his erudition and active guidance. With his passing away TSI has lost a great mentor and visionary. While this void can never be filled, we can pay our tribute to his memory by serving the cause of Tribology to the best of our ability.

We are currently in the midst of full-fledged preparations for the upcoming mega event, ASIATRIB-2014, which is now scheduled to be held during 17 – 20 February 2014 at the Jaypee Palace Hotel and Convention Centre, Agra. TSI was fortunate to be awarded the prestigious opportunity to host this international event, but this also makes all of us responsible to ensure that the Conference achieves the highest professional standards, in keeping with India's and TSI's image. All of us need to come forward and contribute our best efforts to make that happen.

The 5th TSI Summer School is also coming up in June 2013 and the organizing team is working very hard to make this a grand success. Please do support this event in the best possible manner.

My best wishes to all of you and members of your family for an enjoyable holiday season and summer vacation.

Dr R K Malhotra
President
Tribology Society of India



From the desk of Secretary – TSI

Dear Colleagues,

This issue of TSI Newsletter comes to you as the first offering under the new Executive Committee. As you are aware, the new EC has taken charge on conclusion of our ICIT-2012 event at Pune in December 2012. On behalf of the new Committee, I would like to thank all our Members for electing the new team and reposing their faith in us. All of us will devote our best efforts to live up to your expectations and take TSI to greater heights.



On a sombre note, I would like to mention about the sad and untimely demise of one of our great mentors, Prof. Sanjay K. Biswas of Indian Institute of Science, Bangalore, who passed away in April 2013. Prof. Biswas was one of our finest minds in Tribology education and research, who put Indian Tribology on the world map. His passing away has created a void that would probably never get filled.

The current year will be marked by several important TSI events. You must have already received intimation about the 5th TSI Summer School during 24 – 28 June 2013 at IIPM, Gurgaon. The organizing team at TSI Headquarters, under the guidance of Mr. A K Mehta, ED (TSI), has worked very hard in giving final shape to this important national event on academia-industry interaction. Like the earlier four editions, we expect this year's Summer School also to be a grand success.

You will be happy to know that a TSI delegation comprising Mr. Ajay Kumar, Prof. Satish C. Sharma and Prof. C. S. Ramesh actively participated in the 68th STLE Annual Meeting at Detroit in May 2013. Their interaction with the STLE Board was very productive and I am sure this will be an important milestone in our on-going collaborative relationship with STLE.

We are currently in the midst of hectic preparations for our mega event of next year, the ASIATRIB-2014. As you are aware, this prestigious Conference is now slated to be held during 17 – 20 February 2014 at the Jaypee Palace Hotel and Convention Centre at Agra. This will be a landmark event in the history of TSI and will make our Society a truly global player. All of us need to put in our best efforts to achieve this goal. Please do come forward and join hands with the Organizing Committee in whatever way you would like to contribute your support. Organizing an international event of this scale is a challenging task, but I sincerely believe that together we can make this event a grand success.

I take this opportunity to convey my best wishes to you and your family for a very enjoyable summer vacation.

With best wishes,

Dr. Barun Chakrabarti
Secretary - TSI

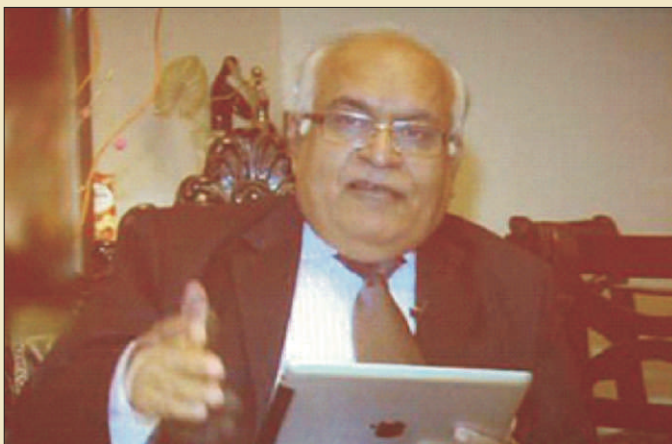
8th International Conference on Industrial Tribology (ICIT 12), 7-9 December, 2012, The Westin Koregaon Park, Pune

The 8th International Conference on Industrial Tribology (ICIT 12), 7-9 December, 2012, was organised at hotel, The Westin Koregaon Park, Pune. The Theme of the Conference was "Tribology for Sustainable Development".

The ICIT12 was sponsored by M/s Indian Oil (Platinum Sponsor), M/s AFTON, Mumbai; M/s Bharat Petroleum Corporation Ltd., Mumbai; M/s Hindustan Petroleum Corporation Ltd., Mumbai; M/s Larsen & Toubro Ltd. Mumbai and M/s Lubrizol India P. Ltd. were Gold Sponsor and M/s EATON Corporation, Mumbai, M/s NEI, Jaipur and M/s Tata Steel, Jamshedpur were silver sponsors.



**Mr. Jerry Byers President, STLE
Lighting the lamp during the inaugural Session.**



**Dr. R K Malhotra, President TSI
giving his video recorded message**

The ICIT 2012 was inaugurated by Mr Jerry Byers, President, STLE. Dr. Arun Jaura, VP Technology Centre, Eaton was the Guest of Honour. Dr. R K Malhotra, Director Indian Oil R&D and President TSI was unable to attend the conference due to pressing personal engagement. A recorded video message by President TSI was presented during the inaugural function.

There were 16 Oral and 4 Poster sessions covering Bearing and Gear Tribology, Wear Mechanisms, Surface Treatment & Coatings, Lubricants & Additives, Tribology in Manufacturing, Condition Based Maintenance System, Contact

Mechanics & Friction, Automotive Tribology, Tribology – testing, Special Topics in Tribology.

Besides the above mentioned 16 oral technical sessions, there were following seven **invited / Plenary lectures which included:**

- Prof Satish Kailas on "Sustainability : Closing the Cycle and Tribology"
- Dr. B Basu on "Formulating Lubricants using Artificial Neural Networks (ANN)"
- Mr Jerry Byers on "Evaluation of Metalworking Fluids and Trends in the Industry"
- Prof. Wilfried J Bartz on "Future Energy Sources for Mobility- Contribution of the Green Automobiles".
- Mr George Plint on "The Effects of Test Machine Dynamics on Tribological Response"
- Prof Koshi Adachi on "Creation of Nanointerface for Super-low Friction"
- Dr. Georges Limbert on "When Tribology meets Biology".

Conference Participation : There were 205 registered delegates from academic faculty, research students and Industry engineers and R&D personnel from 9 countries including Austria, Germany, India, Japan, Korea, Singapore, Sweden, the UK and the US.



Release of ICIT 12 Souvenir during Inaugural Session

Technical exhibition: There were 17 Stalls displaying products and services related to Tribology. The response from delegated towards the Exhibitions was excellent".

Business meet sessions : There were 6 business meet sessions from RTEC Instrumeents, USA ; STLE, USA ; SKF QTC Austria, BASF India , Metallising Equipment Company P Ltd, Jodhpur and from TSI.

Pre-conference program : Two one-day Education Courses on Basics of Tribology and Automotive Tribology were also organized, with 24 and 22 participants, respectively.



**Mr. Jerry Byers President, STLE
inaugurating the Tech Exhibition**

Awards during ICIT 2012 : Following awards were given during the conference.

Best Oral Paper (Basic Research) : "An Experimental Study of a Misaligned Fluid Film Journal Bearing System" by Jagjit Singh Mann, Navjot Singh and R K Awasthi, (Paper # TSI812538)

Best Oral Paper (Industrial) : " Application of Various Types of Diamond like Carbon (DLC) coatings on Polymer for Improved Barrier Performance" by SS Roy and J A Mclaughlin (Paper# TSI812651)



**Mr. Arun Jaura, VP Technology Centre, Eaton
inaugurating Poster Session**

Best Poster Paper (Basic Research) : " A Design Guide for Preventing Stick- Slip in Sliding Friction of Elastic Materials" by Satoru Meagawa , Ken Nakano, Fumihiro and Takashi Nakamura (Paper # TSI812587).

Best Oral Paper (Industrial Application) : "Engine Oil-Studies of some Properties and Comparative Studies" , by Arjun Mehra , Satish B Purohit (paper# TSI812550)

The awards were presented by Prof. Wilfried J. Bartz during the valedictory session.



**Prof. Wilfried J. Bartz presenting Best Oral Paper
(Industrial Application) to Dr SS Roy.**



Prof. Wilfried J Bartz, delivering Valedictory lecture.

EC Members, 2013-14 Term



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TSI Karnataka Chapter Office Bearers For 2013 - 2014 Term

SI.No	NAME'S	DISIGNATION	PHONE.NO	E-Mail
1	Mr. Anshuman Dube	Chairman	9343806663	Anshuman.tsi@ducom.com
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4	Mr. Hemanth Asher	Treasurer	9900543113	friconlub@gmail.com

TSI Mumbai - Pune Chapter Office Bearers For 2013 - 2014 Term

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1	Dr. Sudhir Rashingkar	Chairman	9822022014	sudhirr@vsnl.com
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3	Mr. P.K.Limaye	Secretary	9869015710	pklimaye@barc.gov.in
4	Dr. Vikas M. Phalle	Treasurer	9819818084	vmphalle@vjti.org.in

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3	Mr. P Banerjee	Treasurer	9424411399	pramathab@yahoo.com

Tribology Laboratory, Indian Institute of Science, Bangalore 560 012

The Tribology Laboratory at the Indian Institute of Science, Bangalore is an offshoot of the Tribology Laboratory created by Prof. S. K. Biswas in the mid 80's. The main tribology activities are presently being run by Prof. Satish V. Kailas, who established this lab in the late 90's. Prof. M. S. Bobji also conducts research activities related to tribology, mainly focusing on the surface mechanics related aspects in tribology. The tribology laboratory presently does research on the following activities related to tribology

- 1) Basic wear mechanisms
- 2) Fretting wear
- 3) Eco-friendly lubricants
- 4) Seizure phenomena in Friction Stir Welding

For conducting these studies, various equipment have been designed and built. These include the scratch tester, high-temperature controlled-environment pin-on-disc tester, high-temperature controlled-environment fretting wear tester, friction stir welding machine for doing the experimental work. The other equipment used mostly for the lubricant related work include a four ball tester, cone penetration tester, roll stability tester, water washout tester, leakage tendency tester, turning dynamometer and drilling dynamometer. For the characterization work there is a fully automated micro hardness tester, 3-D optical profilometer, differential scanning calorimeter, fatigue testing machine and a new scratch tester capable of doing 3-D image stitching.



High-temperature controlled-environment pin-on-disc tester



High-temperature controlled-environment fretting wear tester



Four-ball tester



Micro-hardness tester

Presently there are 12 Ph.D. students and 1 MSc(Engg.) student and 3 ME students working in various areas of tribology and friction stir welding/processing. A total of seven Ph.D. (one submitted) and 3 M.Sc.(Engg.) students have graduated from the tribology lab till date.

TSI New Members Nov 2012 - March 2013

S NO	DOM	LM #	NAME	DESIGNATION	ORGANISATION
1	2-Nov-12	5164	SUDHEER M	ASSISTANT PROFESSOR	ST. JOSEPH ENGG. COLLEGE, MANGALORE
2	30-Nov-12	5165	Dr KAROLINA R M	Product Manager	HYSITRON NANOTECH. INDIA , TRIVANDNUM
3	3-Dec-12	5166	VIVEK RANJAN SRIVASTAVA	SENIOR MANAGER	INDIANOIL , REFINERIES DIVISION, NOIDA
4	7-Dec-12	5167	SUSANTA SINHA ROY	ASSOCIATE PROFESSOR	SHIV NADAR UNIVERSITY, GAUTAM BHUD NAGAR
5	7-Dec-12	S - 5168	HARSIMARAN SINGH	STUDENT	BEANT COLLEGE OF ENGG. & TECH. , PUNJAB
6	7-Dec-12	S - 5169	AMIT MAHAJAN	STUDENT	BEANT COLLEGE OF ENGG. & TECH. , PUNJAB
7	7-Dec-12	S- 5170	HARPUNEET SINGH	STUDENT	BEANT COLLEGE OF ENGG. & TECH. , PUNJAB
8	7-Dec-12	S - 5171	SANDEEP DEVGAN	STUDENT	BEANT COLLEGE OF ENGG. & TECH. , PUNJAB
9	7-Dec-12	S - 5172	JAGJIT SINGH MAAN	STUDENT	BEANT COLLEGE OF ENGG. & TECH. , PUNJAB
10	18-Dec-12	5173	HIMANSHU PATEL	ASSOCIATE PROFESSOR	L D COLLEGE OF ENGG. , AHMEDABAD
11	1-Jan-13	5174	SUMAN DUTTA	SR. ENGINEER	INDIANOIL , KOLKATA
12	14-Jan-13	5175	SANJEEV KATOCH	DEPUTY MANAGER	INSTITUTE FOR AUTO PARTS AND HAND TOOLS TECHNOLOGY, PUNJAB
13	6-Feb-13	5176	MILIND RAGHUNATH JOGLEKAR	PARTENER	M/S ARKEJAY & CO. , PUNE
14	20-Feb-13	5177	S C PADHI	Asst. General Manager	SAIL, ROURKELA
15	26-Feb-13	5178	SNEHAL D. SHUKLA	Ass.Prof. in Mathematics	Shri R.K.Parikh Arts and Science College, GUJARAT
16	1-Mar-13	5179	SHRINIVAS RATHOD	RESEARCH FELLOW	CSIR-AMPRI, BHOPAL
17	1-Mar-13	5180	KRISHNA KUMAR THAKUR	ASST. PROFFESOR	SAGAR INST. OF RES. & TECH. , BHOPAL
18	1-Mar-13	5181	AMITABH SHRIVASTAVA	ASST. PROFFESOR	SAGAR INST. OF RES. & TECH. , BHOPAL
19	5-Mar-13	5182	AMIT J SOLANKI	ASST. MANAGER	ULTRATESH CEMENT LTD., RAJKOT
20	5-Mar-13	5183	V RAGUNATHAN	CHIEF MANAGER - TECH. SERVICES	HPCL, MUMBAI
21	12-Mar-13	5184	SHUBRAJIT BHAUMIK	ASSISTANT PROFESSOR	SRM UNIVERSITY, TAMIL NADU
22	13-Mar-13	5185	MR. PRAMOD SHRIVASTAVA	MANAGING DIRECTOR	CHAMPION ENGINEERING EXPORTS PVT. LTD, MUMBAI
23	15-Mar-13	5186	NIKHIL VERMA	MANAGER - TECH. SERVICES	HPCL, PUNE
24	15-Mar-13	5187	SUHAS NATH	APPLICATION ENGINEER (BEARING)	SKF INDIA LTD / KOLKATA BRANCH, KOLKATA
25	15-Mar-13	5188	ROHIT UPADHYAYA	DGM, R&D DEPTT.	METALLIZING EQUIPMENT CO. PVT. LTD, RAJASTHAN
26	18-Mar-13	5189	SADAPHAL NILESH DATTATRAY	ASSISTANT PROFESSOR	SRES COE KOPARGAON, AHMEDNAGAR
27	26-Mar-13	5190	C T CHIDAMBARAM	MANAGER - TECHNICAL	CARBORUNDUM UNIVERSAL LTD, CHENNAI
28	26-Mar-13	5191	SANDEEP SINGH	ASSISTANT PROFESSOR	NERIST, ITANAGAR

PhD AWARDED - 2013

Title of PhD Thesis: A STUDY OF NON-RECESSED JOURNAL BEARINGS WITH MICROPOLAR AND COUPLE STRESS LUBRICANTS
 Name of Candidate: **Nathi Ram**
 Name of Supervisor: Prof. Satish C. Sharma
 Department: Mechanical and Industrial Engineering, IIT Roorkee

Bearings greatly affect the performance of a machine. The high speed and precision required in the machine has led to revolutionize the design and development of various bearing configurations. Non-recessed Hydrostatic/hybrid journal bearing systems were developed due to their excellent characteristics over recessed/pocketed journal bearings. The non-recessed bearing systems especially the hole-entry and the slot-entry type hybrid journal bearings provide an excellent performance such as increased load carrying capacity at low as well as high speeds with low power consumption, increased minimum fluid-film thickness, large fluid film damping and stiffness along with relative simplicity in manufacturing.

In the present work, an analytical model has been used to account for and analyze the individual/combined influence of micro-polar and couple stress lubrication along with surface roughness on the performance of non-recessed journal bearing system. The Reynolds equation for the flow of micro-polar lubricant in journal bearing system has been derived on the basis of Eringen's micro-polar lubrication theory. For the flow of couple stress lubricant in journal bearing system, the Reynolds equation has been derived on

the basis of Stoke's couple stress theory. Further, the Reynolds equations have been modified by considering the effect of surface roughness in the analysis of journal bearing system. A surface roughness model proposed by Patir and Cheng has been used in the present study. The fluid film pressure field is obtained by solving the modified Reynold's equation. In the present work, finite element method has been used to solve the problem with appropriate iterative schemes. The modified Reynold's equation is solved by taking the flow of lubricant through capillary, orifice, constant flow valve and slot restrictors as a constraint along with relevant boundary conditions. The non-linear equation, in the present work, has been solved using the Newton-Raphson iterative method. The numerically simulated results presented in this study indicate that the performance characteristics of non-recessed journal bearing configurations are significantly affected by the micro-polar and couple stress lubrication. The present study further reveals a significant interaction between the influences of micro-polar lubrication, couple stress lubrication and surface roughness on the performance characteristics of a symmetric/asymmetric non-recessed journal bearing configurations. Thus, the influences of these effects should be studied together rather than individually for the realistic prediction of bearing performance characteristic data.

(For further details, please contact Dr. Nathi Ram / Prof S C Sharma at sshmefme@iitr.ernet.in)



First Announcement & Call for Paper - ASIATRIB 2014, 17-20 Feb. 2014 at Jaypee Palace Hotel & Convention Centre, Agra, India.

ASIATRIB-2014 is the upcoming mega event in the series of International Tribology Conferences being organized once in every four years, by one of the National Tribology Societies from Asia-Pacific countries. The previous one in this series of conferences, i.e. ASIATRIB-2010, was organized at Perth, Australia in December 2010.

This international tribology event, ASIATRIB-2014, fifth in its series, will be organized by Tribology Society of India during 17-20 February, 2014 at Agra, India. Agra is world renowned for the **Taj Mahal**, which is one of the Seven Wonders of the World and a World Heritage Monument. The Conference venue is in close vicinity of the Taj Mahal.

Call for Papers

Prospective contributors are requested to submit abstract of their paper online through the Conference website Asiatrib2014.org in about 250 words latest by **30th July, 2013**. On acceptance, contributors of the selected papers would be required to submit manuscript of the extended abstract (up to 4 pages) latest by **30th September, 2013**. The guidelines for authors and the template for the extended abstract is available for downloading from the website.

Important Deadlines for Technical papers

- **Submission of Abstract** : 30th July, 2013
- **Acceptance of Abstract** : 30th August, 2013
- **Submission of Extended Abstract** : 30th September, 2013

First Announcement & Call for Papers



Tribology Society of India Announces

ASIATRIB - 2014

17-20 February, 2014

At Jaypee Palace Hotel & Convention Centre, Agra, India

Theme: Green Tribology



www.tribologyindia.org



Please visit www.asiatrib2014.org for more details

■ ■ Obituary : Prof. Sanjay Kumar Biswas ■ ■

Prof. Sanjay Kumar Biswas, a distinguished Tribologist and a former Professor and Dean at the Indian Institute of Science - Bangalore, passed away on 28th April, 2013 at the age of 68 years. Prof. Biswas, the doyen of Indian Tribology, was a globally respected figure who put Indian Tribology on the world map.



Prof. Sanjay Biswas did his B.Tech from the Indian Institute of Technology in 1966, his Masters from University of Strathclyde in 1969 and his Ph.D from the University of Birmingham in 1972. He then moved to the Indian Institute of Science and set up the Tribology Laboratory. Under his leadership, this laboratory has been doing pioneering research in Tribology for over 30 years. Prof. Biswas was actively involved in several projects on basic research even after retirement. The passion for design of machines was a hallmark of Prof. Biswas, which started off with the design of a pin-on-disc machine around 30 years ago and led to the development of several machines including a scratch tester, nano-indentor and surface force apparatus over the years. A new machine, based on a design conceptualised by Prof. Biswas, was to be manufactured and the order for the machine was just being cleared when he breathed his last. Such was his involvement in research even after retirement. The laboratory set up by Prof. Biswas has distinguished itself through fundamental work on Tribology at the nano scale, with an array of advanced equipment possibly unmatched in this country. He ensured that his students got access to the best of the facilities and freedom to do work. He made his students realise that, once they went into the depth of any problem, there would be several unanswered questions.

Prof. Biswas was also instrumental in starting the Bio-engineering program at the Indian Institute of Science and he had planned to start off this program in a grand scale. Unfortunately fate willed otherwise. His energetic presence will be missed by hundreds of students, institutes and organizations, who benefited from his erudition and active guidance.

His commitment to the growth of Tribology in India led him to play an active role in the Tribology Society of India, of which he was a great patron since its inception. He was the Vice-President of TSI for some years and was instrumental in organising the International Conference on Industrial Tribology in 2006 at the Indian Institute of Science, Bangalore - an event that is remembered by many as one of the best Tribology Conferences the country has seen.

Prof. Biswas was one of the most gifted Tribology educators and researchers of our times and made immense contribution in taking Indian Tribology research to the world. With his passing away TSI has lost a great mentor and visionary. While this void can never be filled, we can pay our tribute to his memory by serving the cause of Tribology to the best of our ability.

The Executive Committee and all Member of TSI convey their deepest condolences to the bereaved family of Prof. Biswas. May the departed soul rest in eternal peace.

Edited by

Dr. H. Prashad, Vice President (TSI)
on behalf of Tribology Society of India

Please send your suggestions/contributions/feedback for
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