



# **World Conference on Thermoelectrics and Materials – 2023 (WCT 2023)**

**March 14<sup>th</sup>~18<sup>th</sup>, 2023**

Organized by

**Jaipur National University, Jaipur**

In association with

**Materials Research Society of India,  
Rajasthan Chapter**

Sponsored by



**Science and Engineering Research Board**  
(Statutory Body Established Through an Act of Parliament : SERB Act 2008)  
Department of Science and Technology, Government of India

## **About the conference:**

Thermoelectric materials have combination of thermal, electrical and semiconducting properties which allow them to convert heat into electricity and vice versa. This unique property makes their role very important in meeting the carbon neutral / zero emission goals for the environment, and hence energy-saving thermoelectric technology is expected to play a large and critical role in future.

Despite the substantial advances in the development of new high performance materials, the discovery of new enhancement principles, the extension of transport bulk theory to micro and nano structures is still under development. Hence widespread use of thermoelectrics still requires finding new strategies to design and develop high efficiency materials, devices and circuits. For this realization theory and simulation must be able to communicate with experiments in a qualitative way. This is possible only through the dynamic and myriad exchanges and discussions organically blossoming at the conferences and workshops. Due to the Covid pandemic, the physical meetings were almost stopped; although a large number of virtual meetings were held but the level of interaction needed for serious science was damped.

So it is a great pleasure and honour to invite the worldwide thermoelectric research community, to join us at the first world conference on thermoelectrics at Jaipur, Rajasthan, India. Earlier Jaipur has held five conferences on the theme “Micro and Nano Electronic Devices & Systems” and after a brainstorming session the theme of the proposed conference has been narrowed down to the field of thermoelectrics and materials. It is a very vibrant city and has about 30 universities and institutes of higher learning in its vicinity. A large number of young PhD scholars and faculty members are actively engaged in the study of thermoelectric materials and devices, so is a good place to share/witness the latest developments in the field of thermo-electrics and materials all over the world.

The Organizing Committee of the WCT2023 believes that it will be a great opportunity for not only to gain the academic insights but also feel the diverse Indian culture and life styles.

We are looking forward to warmly welcoming you to WCT2023 at JNU Jaipur.

**Chairs**

## Objectives:

1. Exchange of novel and latest theories and materials towards the improvement of the thermoelectric conversion efficiency.
2. Provide a platform for researchers to display/ share their work at the forefront of the renewable energy endeavor for the foreseeable future.
3. Building a strong international community in a field that has wide scientific, technological and industrial applications.
4. Start a series of events for establishing a community working on the thermoelectric energy conversion.
5. To give the opportunity to young scientists to present their achievements alongside more senior colleagues.

**Keywords:** Thermoelectrics, Micro and Nano materials, Thin films, Thermoelectric devices, Thermoelectric modules, applications of thermoelectrics.

## Topics:

### A: Theoretical Studies

- A1: Theoretical study of bulk, micro and nano materials
- A2: Novel concept and related physical phenomenon
- A3: Informatics, data mining, machine learning
- A4: Other theoretical considerations

### B: Materials

- B1: Tellurides, Selenides and Sulfides
- B2: Oxides & Silicides
- B3: Heusler compounds
- B4: Pnictides
- B5: Organic & hybrid compounds
- B6: Micro and Nano materials
- B7: Other material topics
  1. Semiconductor Materials and Devices
  2. Materials for Photovoltaics, Fuel Cells, and Batteries
  3. Piezoelectric Materials
  4. Materials and Devices for Sensors and Transducers
  5. Materials, Processing, and Devices for Flexible Electronics
  6. 2D Materials and Applications: Graphene and Beyond Graphene
  7. Magnetic, Spintronics and Superconductor materials
  8. Advanced Fabrication and Characterization of Materials and Devices
  9. Advanced Functional Materials and Applications
  10. Computational Materials and Applications
  11. Materials and Devices for Displays and Optoelectronics
  12. III-V and II-VI material and Devices
  13. Biomaterials, Soft, and Nature Inspired Materials and Applications
  14. Neuro-inspired Memory and Quantum Computing Materials and Devices
  15. Materials for Oxide Electronics
  16. Nanomaterials: Synthesis and Devices
  17. Dielectric and Ferroelectric Materials
  18. Materials for Energy and Environment

**C: Measurements & Characterizations**

C1: Nano/ microstructure

C2: Properties

C3: Other measurements and characterizations related aspects

**D: Thermoelectric modules and their Applications**

D1: Design and fabrication of modules and thermoelectric generators

D2: Bulk and Thin film devices

D3: Large scale thermoelectrics

D4: Cooling applications

D5: Automotive applications

D6: Generator applications

D7: Sensor applications

D8: Other aspects

## **About Jaipur:**

Jaipur is the capital and largest city of the Indian state of Rajasthan and is also known as the Pink City, due to the dominant color scheme of its buildings. It is also known as the Paris of India, and Sir C. V. Raman called it the Island of Glory. Jaipur is a popular tourist destination and forms a part of the west Golden Triangle tourist circuit along with Delhi and Agra. It also serves as a gateway to other tourist destinations in Rajasthan such as Jodhpur, Jaisalmer, Bharatpur, Udaipur, Kota and Mount Abu.

The main attraction of Jaipur is its archetypal architecture. The city was planned as per the Indian Vastu Shastra, a science that promotes well being and prosperity. On 6 July 2019, UNESCO World Heritage Committee inscribed Jaipur the "Pink City of India" among its World Heritage Sites. The city is also home to the UNESCO World Heritage Sites Amer Fort and Jantar Mantar (It is a collection of 19 remarkable astronomical instruments) and other forts and monuments such as Hawa Mahal, City Palace, Jal Mahal, Rambagh Palace, Nahargarh Fort and Jaigarh Fort, famous world over. The best time to travel the city is between December to March as the city's average temperature remains below 20 °C or 68 °F during this time of the year. These months are mild, dry, and pleasant, sometimes chilly.

## **About Jaipur National University (JNU), Jaipur:**

Jaipur National University is a UGC-approved and NAAC accredited University established in 2007 through an ordinance of the Government of Rajasthan. The University is situated at Jagatpura, Jaipur on 125 acres of land having 17 schools/departments, offering 141 undergraduate, postgraduate, research and diploma programs in various streams of Medical, Engineering, Science, Commerce and Humanities, for a population of over 6000 bright young minds. All the programs are approved by respective statutory bodies. The academic activity of the University is driven by 600 + well-qualified faculty, led from the front by seasoned academics and institution builders. Focus on research, excellent placements, state-of-the-art infrastructure, exemplary academic environment, efficient governance, guidance of stalwarts, and NAAC accreditation - all of this eventually has made JNU one of the most sought-after destinations for budding minds to pursue quality and affordable education.

## About Materials Research Society of India (MRSI)

The Materials Research Society of India came into existence in February 1989, thanks to the farsighted vision of Prof. C N R Rao. Prof. Rao functioned as the first President and laid the foundation for its impressive growth over the past decade. MRSI functions through 18 Regional Chapters and 16 Subject groups. MRSI is supported by individual members and institutions who will be patrons of the society. Its current membership includes 2745 Life members, 07 Annual members, 156 Honorary members and 83 Patron members amounting to a total of 2991 members. MRSI recognizes contributions to materials research through Distinguished Materials Scientist of the year Award, MRSI-ICSC Superconductivity and Materials Science Senior Award and MRSI Distinguished Lecturership Award. There are number of other prizes including the MRSI Medal Lectures. Every February an annual technical meeting is held. The hosting of IUMRS-ICA 98 meeting at Bangalore during October 13-16, 1998 was a major activity of MRSI. The Conference had 22 Theme Symposia and was held in 7 parallel sessions. More than 150 invited talks were delivered and nearly 700 contributed papers were presented. The proceedings of the Conference, consisting of the invited talks are published as a special issue of Bulletin of Materials Science. Another major activity was the hosting of IUMRS-ICAM 2007 meeting at Bangalore during October 8-13, 2007. The conference had 23 theme symposia, 6 plenary lectures and 250 invited talks. Around 1100 delegates attended the conference. The MRSI has been regularly publishing the MRSI Newsletter. This is a quarterly publication. Several issues have been brought out successfully for the past ten years. MRSI co-sponsors the publication of Bulletin of Materials Science (BMS) published by the Indian Academy of Sciences. MRSI is a founding Adhering Body of the International Union of Materials Research Societies (IUMRS) and participates in the international arena of materials research.

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### **Registration and Abstract Submission:**

**Abstract Submission:** Reports of original work in any of the topics of the Conference are invited for oral or poster presentation. Authors are requested to indicate their preference while submitting the Abstract during registration.

### **Key Dates:**

Abstract submission: February 28<sup>th</sup>, 2023

Full paper submission: March 5<sup>th</sup>, 2023

### **Registration:**

The registration fee covers admission to all conference sessions and it can be paid through online transfer only.

Category	Registration Fee		
	Early Bird Until February 25 <sup>th</sup> , 2023	From February 25 <sup>th</sup> to March 2 <sup>nd</sup> , 2023	After March 2 <sup>nd</sup> , 2023
Foreign Participants	€ 350	€ 500	€ 600
Foreign Students*	€ 180	€ 250	€ 300
Foreign accompanying Person**	€ 200	€ 300	€ 350
Indian Participants	₹ 4000	₹ 5000	₹ 6000
Company Participants	₹ 6000	₹ 8000	₹ 10000

Indian Students*	₹ 2000	₹ 3000	₹ 4000
Indian accompanying Person**	₹ 2500	₹ 3500	₹ 5000

## Key Dates:

Early Registration: February 25<sup>th</sup>, 2023

Deadline for registration: March 05<sup>th</sup>, 2023

**Click here for WCT – 2023 registration:** <https://forms.gle/BVoe8FrSTAGoWX7PA>

\*Upload a copy of valid Institute ID card during online registration.

## Guidelines for Oral and Poster Presentation Preparation:

### Oral presentation:

Invited and oral presentations will be provided 30 and 15 minutes (including 5 minutes of discussion), respectively. Authors are expected to notify the Session Chairperson about their presence 15 minutes before the start of the session. Presentations must be made in Electronic Form (PowerPoint, PDF) having compatibility with the Windows Platform. Computerized projection facilities will be provided for oral presentations, including an LCD projector, a computer and a screen. Presentations from Personal Laptops will not be allowed. All speakers are required to submit an electronic version of their presentation to conference secretariat before March 2<sup>nd</sup>, 2023.

### Poster presentation:

All posters are required to be prepared in Portrait Orientation (Poster Board dimensions are 1 m width x 1.20 m height). Although material required to fix the poster will be available at the venue, still it is recommended to have own arrangements. All presenters are required to share the soft copy of their posters to conference secretariat before March 2<sup>nd</sup>, 2023.

### Accommodation Details:

An accommodation in the hostel facility will be provided for outstation participants on a limited basis (first come first serve) on prior intimation. Participants are required to make their own accommodation arrangements. There are many hotels in Jaipur, offering various standards and prices.

### Bank Account Details for registration fees deposition:-

Account Name : Jaipur National University

Bank : Punjab National Bank

Branch : Jawahar Nagar, Jaipur, Rajasthan, India

Account Number: 2246002100023655

IFSC Code: PUNB0224600

### Passport and Visa:

To visit India one must have a valid passport. A visa is required for the citizens of countries that do not have visa-exempt agreements with India. If a participant needs to apply for a visa, s/he has to register for the conference, pay full registration fee and request an invitation letter from WCT2023 Secretariat. For the invitation letter one has to include full name, passport data (country, number, issue and expiry date), date of birth and contact details (address to which the letter of support has to be sent) in the email request. Visa acquisition process is time consuming so it should be applied well in advance. The Organizers do not accept any responsibility for visa applications. Participants have to contact local Indian Embassy/ Consulate/ High Commissions to learn more about visa acquisition.

**Indian embassies worldwide:** <https://eoi.gov.in/>

**Indian Consulate worldwide:** <https://cgi.gov.in/>

**Indian High Commissions worldwide:** <https://hci.gov.in/>