# The 42nd International Conference on Thermoelectrics

May 17 - 21, 2026

Houston, Texas U.S.A

Hyatt Regency Downtown Houston

# Program At A Glance


# The 42nd International Conference on Thermoelectrics

May 17-21, 2026 | Houston, TX, USA

Dear Colleagues,

We are pleased to welcome you to vibrant, multicultural Houston as we come together to advance science and engineering through discussions, strengthen our collaborations, and mentor students and young professionals to advance breakthrough energy technology to benefit mankind.

During this time of global unrest and travel uncertainty, we have continued our commitment to present our city in a manner that celebrates our reputation as the "Energy Capital of the World." Heat and electricity are undoubtedly two most essential forms of energy, and following conference tradition, we have endeavored to include all areas of thermoelectric research: from computational and theoretical work to experimental studies; from materials to modules and devices. We have introduced new topics in thermal management materials and devices, such as high thermal conductivity materials and innovative designs for efficient heat transfer across all scales, and very low thermal conductivity for thermal insulation to increase the energy system efficiency.

We look forward to presentations from academia and industry, hoping these topics will inspire fresh ideas for discovering better materials and improving the energy conversion efficiencies to harness the abundant thermal energy. Given that workforce needs in the energy industry have skyrocketed, we have encouraged students and early career professionals to participate in the conference to connect with potential employers and are providing a networking opportunity so they can strengthen their ties with each other.

We are grateful to our sponsors, advertisers, and exhibitors for their support and involvement, and are indebted to our small team who has worked tirelessly to organize the conference.

Although many are unable to attend due to situations beyond their control, we can all renew our commitment to global science and engineering and strive to move the field of thermoelectrics forward. We look forward to engaging discussions and insightful outcomes at ICT 2026 in Houston!

Zhifeng Ren, Co-Chair
Shuo Chen, Co-Chair
Department of Physics, and
Texas Center for Superconductivity at the University of Houston

# COMMITTEES

### Conference Chairs

Zhifeng Ren, University of Houston; Shuo Chen, University of Houston

### Local Committee

Susan Butler, University of Houston
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Brion Jacobs, University of Houston
Zhongxin Liang, University of Houston
Ying Peng, University of Houston
Shaowei Song, University of Houston
Dezhi Wang, University of Houston
Bo Zhao, University of Houston

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Takao Mori, National Institute for Materials Science
Dario Narducci, University of Milano Bicocca, Italy
Arvind Narayanaswamy, Columbia University, USA
Kornelius Nielsch, Leibniz Institute of Solid State and Materials Research, Germany
George S. Nolas, University of South Florida, USA
Su-Dong Park, Korea Electro-technology Research Institute
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Jong-Soo Rhyee, Kyung Hee University, Korea
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Xun Shi, Shanghai Institute of Ceramics, CAS, China
Junichiro Shiomi, Tokyo University, Japan
Li Shi, University of Texas at Austin, USA
G. Jeffrey Snyder, Northwestern University, USA
Jiehe Sui, Harbin Institute of Technology, China
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Qian Zhang, Harbin Institute of Technology, China
Li-dong Zhao, Beihang University, China
Huaizhou Zhao, Institute of Physics, CAS, China
Tiejun Zhu, Zhejiang University, China
Mona Zebarjadi, University of Virginia, USA
Alexandra Zevalkink, Michigan State University, USA

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As of 04/28/2026. Check for latest updates.

Website: https://www/ict2026houston.com

# ICT LOGISTICS

**Hotel Reservations & Information**

Conference Hotel: Hyatt Regency Houston Downtown | Reservations for the official ICT conference hotel are available at https://www.ict2026houston.com/Pages/housing.html. Please book through the portal to receive ICT discount rates until April 22, 2026. A block of rooms at the state/government per diem rate are also available for the consecutive nights of May 17 – 21. Contact cc@centennialconferences.com for per diem details.

**On-Site Registration Desk**

Pre-registered, fully paid participants can pick up their registration materials at the registration counter in the Imperial Ballroom Foyer on Level 3 of the Hyatt Regency Hotel Downtown. If you are a **pre-registered** attendee with a balance due, check in at the registration counters, and proceed to the Cottonwood Room (Level 3). For **on-site** registrations, please register online and remit payment at https://www.ict2026houston.com/Pages/reg.html prior to visiting the registration counter. Bring your registration number and 'Payment Processing' receipt with you. Please check your credit card prior to arrival. Cash and checks will not be accepted on site.

**Hours of Operation**: Registration, Speaker Ready Room, Exhibits Hall

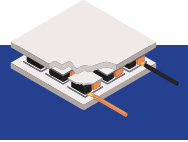
| | **Registration Hours** Imperial Foyer, Level 3 | **Speaker Ready Hours** Magnolia Room, Level 3 | **Exhibitor Hours*** Market Place, Lower Level |
|---|---|---|---|
| **0 SUN** | 11:00 a.m.–8:30 p.m. | 11:00 a.m.–8:30 p.m. | 12:00 p.m.–6:00 p.m. *set up* |
| **1 MON** | 7:30 a.m.–7:00 p.m. | 7:30 a.m.–7:00 p.m. | 8:00 a.m.–7:00 p.m. (L, P) |
| **2 TUE** | 7:30 a.m.–7:00 p.m. | 7:30 a.m.–7:00 p.m. | 8:00 a.m.–7:00 p.m. (L, P) |
| **3 WED** | 7:30 a.m.–1:00 p.m. | 7:30 a.m.–1:00 p.m. | 8:00 a.m.–12:00 p.m. |
| **4 THUR** | 7:30 a.m.–1:00 p.m. | 7:30 a.m.–5:00 p.m. | 8:00 a.m.–2:00 p.m. **(L) |
| | | *Upload* at *least 3 hrs. prior* | **Lunch (L), Posters (P)* |
| | | | ***2:00 5:00 strike down* |

**Poster Sessions 1 & 2**

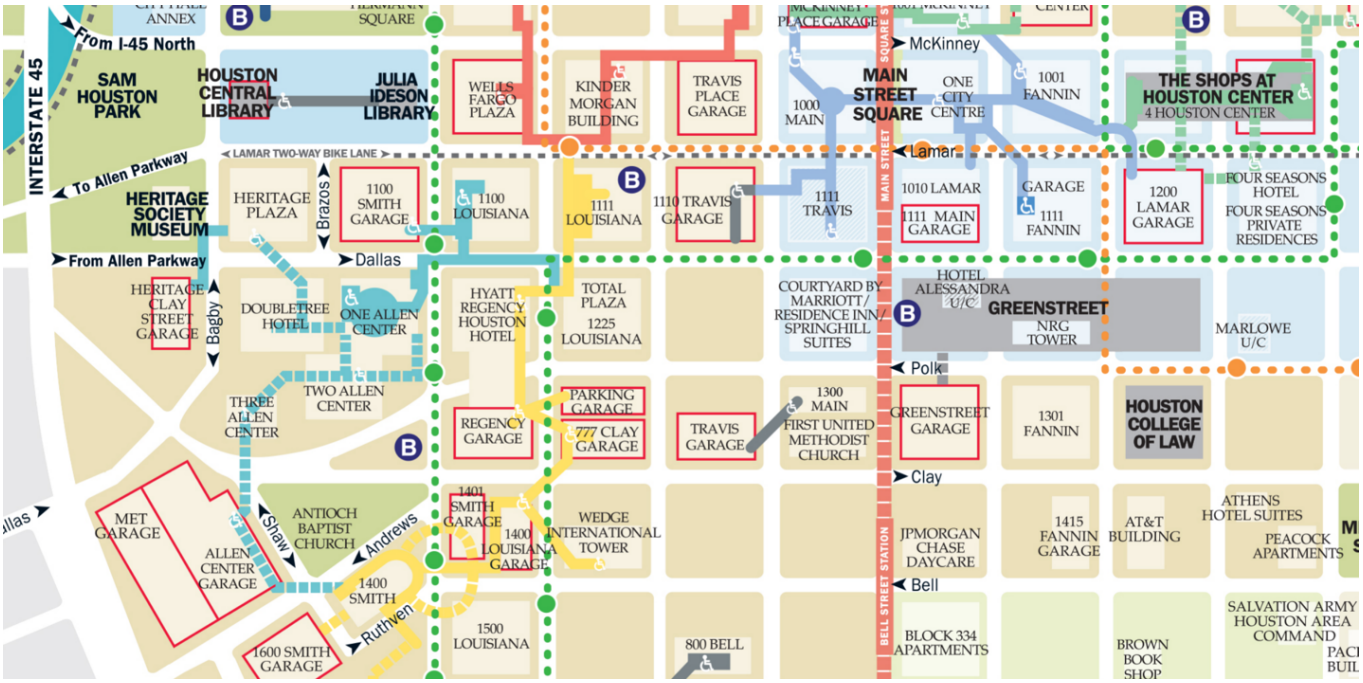
Market Place, Lower Level

| | **Session Time** | **Set Up Time** | **Dismantle Time** |
|---|---|---|---|
| **1 MON** | 5:30 p.m. – 7:00 p.m. | 1:30 p.m. – 5:00 p.m. | 7:15 p.m. – 9:00 p.m. |
| **2 TUE** | 5:30 p.m. – 7:00 p.m. | 1:30 p.m. – 5:00 p.m. | 7:15 p.m. – 9:00 p.m. |



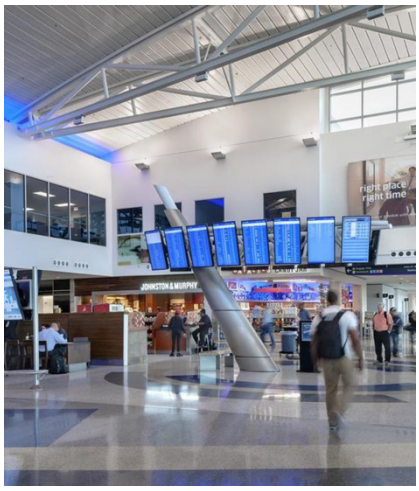


# HOUSTON MAP




Houston Building, Streets, and Tunnels
https://custom.cvent.com/f1ddaf956f46445e99e0baaa734100b2/files/rfp/16ab2a0a9cd242af99cf150b218a8e38/51ded2d49c7a43e6b3b40e8d640003f7.pdf

Driving Directions to Hyatt Regency Houston Downtown: https://www.waze.com/live-map/directions/us/tx/houston/hyatt-regency-houston-downtown?to=place.ChIJbSHsPTm_QIYROwxWIhhDN98
*(includes parking garages)*



**Interactive IAH Airport Map** with terminals, airlines, restaurants, security wait times and ground transportation.
https://www.fly2houston.com/iah/map/

## Local Transportation

**IAH to Hyatt Regency Houston Downtown**

https://www.rome2rio.com/map/Houston-Airport-IAH/Hyatt-Regency-Houston-Downtown with terminals, airlines, restaurants, security wait times and ground transportation.

# PROGRAM OF EVENTS

## Technical Program & Agenda

The detailed technical **Program by Speakers** is available on the ICT website. The ICT 2026 Conference Organizers & Program Committee may make changes to the program based on withdrawals. We advise you to check the schedule before and during the conference for last minute changes, which will also be posted outside the Session Rooms. https://www.ict2026houston.com/Pages/Schedule.html

## Sunday, May 17, 2026

### Conference Activities

#### Registration

11:00 a.m. – 8:30 p.m. • Imperial Ballroom Foyer, Level 3
*Badges required for all sessions and events*

#### Speaker Ready Room

11:00 a.m. – 8:30 p.m. • Magnolia Room, Level 3
*Upload presentations from USB any time, but at least three hours in advance*

#### Exhibitor Move-In

12:00 p.m. – 6:00 p.m. • Market Place, Lower Level

### Technical Event

#### ITS Thermoelectric Summer School

1:00 p.m. – 4:30 p.m. • Regency Room, Level 2 – *Advance registration required*

### Social Functions

#### Welcome to Houston Reception

6:00 p.m. – 8:00 p.m. • Imperial Ballroom, Level 3

### Business | Committee Meetings

#### ITS Board of Directors Meeting

3:00 p.m. – 5:00 p.m. • Dogwood Room, Level 3

# Monday, May 18, 2026

## Conference Activities

### Registration

7:30 a.m. – 7:00 p.m. • Imperial Ballroom Foyer, Level 3

### Speaker Ready Room

11:00 a.m. – 7:00 p.m. • Magnolia Room, Level 3

*Upload presentations from USB any time, but at least three hours in advance*

## Opening, Plenary Sessions

**Welcome Remarks: Takao Mori** (ITS); **Zhifeng Ren and Shuo Chen**(ICT)

8:30 a.m. – 8:40 a.m. • Imperial Ballroom, Level 3

**Plenary 1: Takao Mori**, National Institute for Materials Science (NIMS)

*Development of High-Performance Thermoelectric Materials & Modules for Power Generation and Cooling*

8:40 a.m. – 9:15 a.m. • Imperial Ballroom, Level 3

**Plenary 2: Kornelius Nielsch**, Leibniz Institute for Solid State Materials Research

*From Interface Modifications of Thermoelectric Materials Towards Sustainable Modules*

9:15 a.m. – 9:50 a.m. • Imperial Ballroom, Level 3

**Coffee Break** • Imperial Foyer – Level 3

9:50 a.m. – 10:20 a.m.

**Plenary 3: Lucas Lindsay**, Oak Ridge National Laboratory

*Boron Arsenide for Heat Management: From Phonons to Devices*

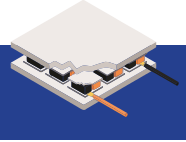
10:20 a.m. – 10:55 a.m. • Imperial Ballroom, Level 3

**Co-Sponsor Seminar – Aaron Schmidt**, Fourier Scientific, LLC

*Frequency Domain Thermoreflectance for Quantitative Measurement and Imaging of Deeply Buried Thermal Interfaces*

10:55 a.m. – 11:25 a.m. • Imperial Ballroom, Level 3





### Looking Forward in Thermoelectrics Research – Panel Discussion

**ITS Outstanding Achievement Awardees:** **Mercouri G. Kanatzidis**, *Northwestern University and Argonne National Laboratory* (2014); **Ctirad Uher**, *University of Michigan* (2017); **Ernst Bauer**, *TU Wien* (2022); **G. Jeffrey Snyder**, *Northwestern University* (2023); **Zhifeng Ren**, *TcSUH/University of Houston* (2024); **Yuri Grin**, *Max Planck Institute for Chemical Physics of Solids* (2025). **Shuo Chen**, moderator.

11:25 a.m. – 12:25 p.m. • Imperial Ballroom, Level 3

## Lunch

### Buffet Lunch | Exhibits Open

12:25 p.m. – 2:00 p.m. • Market Place, Lower Level

## Concurrent Sessions

### Invited & Contributed Talks

2:00 p.m. – 3:30 p.m. • Imperial Ballroom – Level 3

Session 1. Machine Learning–I • Ballroom A

Session 2. Novel Concepts & Related Physical Phenomenon–I • Ballroom B

Session 3: Design & Fabrication–I • Ballroom C

### Coffee Break

3:30 p.m. – 4:00 p.m. • Imperial Foyer – Level 3

### Invited & Contributed Talks

4:00 p.m. – 5:30 p.m. • Imperial Ballroom – Level 3

Session 4. Machine Learning–II • Ballroom A

Session 5. Novel Concepts & Related Physical Phenomenon–II • Ballroom B

Session 6. Design & Fabrication–II • Ballroom C

## Posters

### Poster Session 1

5:30 p.m. – 7:00 p.m. • Market Place, Lower Level

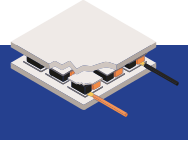
*Set-Up: 1:30 p.m. – 5:00 p.m.; Dismantle: 7:15 p.m. – 9:00 p.m.*

## Social Function

### Student/Young Professional Networking Event

7:30 p.m. – 9:00 p.m. • Level 6, Pool Deck (reserved ticket in registration packet)





## Business | Committee Meetings

### ICT–Hosted ITS Board Dinner

7:30 p.m. – 9:30 p.m.

# Tuesday, May 19, 2026

## Conference Activities

### Registration

7:30 a.m. – 7:00 p.m. • Imperial Ballroom Foyer, Level 3

### Speaker Ready Room

7:30 a.m. – 7:00 p.m. • Magnolia Room, Level 3

### ITS Board Election Ballots Due

Submit in Ballot Box by end of A.M. Coffee Break • Imperial Foyer Registration Counter, Level 3

## Concurrent Sessions

### Invited & Contributed Talks

8:30 a.m. – 10:00 a.m. • Imperial Ballroom – Level 3

Session 7. Heusler Compounds–I • Ballroom A

Session 8. Chalcogenides–I • Ballroom B

Session 9. High and Low Thermal Conductivity Materials–I • Ballroom C

### Coffee Break

10:00 a.m. – 10:25 a.m. • Imperial Foyer – Level 3

### Invited & Contributed Talks

10:25 a.m. – 11:55 a.m. • Imperial Ballroom – Level 3

Session 10. Heusler Compounds–II • Ballroom A

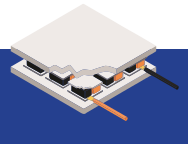
Session 11. Chalcogenides–II • Ballroom B

Session 12: Thermal Interface Materials and Heat Transfer • Ballroom C

**12.4 Sponsor Seminar: Cryochips • Uttam Ghoshal**

*AI to Quantum: CRYOCHIPS' Unified Cooling Revolution*





## Lunch

### Buffet Lunch | Exhibits Open

11:55 a.m. – 1:00 p.m. • Market Place, Lower Level

## Concurrent Sessions

### Invited & Contributed Talks

1:00 p.m. – 2:20 p.m. • Imperial Ballroom – Level 3

Session 13. Antimonides and Oxides–I • Ballroom A

Session 14. Chalcogenides–III • Ballroom B

Session 15. Other Materials & Mechanisms for Thermal Management • Ballroom C

### Coffee Break

2:20 p.m. – 2:45 p.m. • Imperial Foyer – Level 3

### Invited & Contributed Talks

2:45 p.m. – 5:30 p.m. • Imperial Ballroom – Level 3

Session 16. Antimonides and Oxides–II • Ballroom A

Session 17. Chalcogenides and Other Material-Related Topics • Ballroom B

Session 18. Mechanisms for Thermal Management • Ballroom C

## Posters

### Poster Session 2

5:30 p.m. – 7:00 p.m. • Market Place – Lower Level

*Set-Up: 1:30 a.m. – 5:00 p.m.; Dismantle: 7:15 – 9:00 p.m.*

# Wednesday, May 20, 2026

## Conference Activities

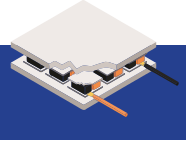
### Registration

7:30 a.m. – 1:00 p.m. • Imperial Ballroom Foyer, Level 3

### Speaker Ready Room

7:30 a.m. – 1:00 p.m. • Magnolia Room, Level 3





## Concurrent Sessions

### Invited & Contributed Talks

8:30 a.m. – 10:05 a.m. • Imperial Ballroom – Level 3

Session 19. Theoretical Study of Bulk Materials–I • Ballroom A

Session 20. Generator Applications • Ballroom B

**20.4 Sponsor Seminar: Orton Ceramic Foundation | Advance Riko • Ying Liu** (9:35 – 9:50 a.m.)
*Comprehensive Solutions for Thermoelectrics: Proven Evaluation Systems and Novel Rapid Cooling*

Session 21. Physical Properties • Ballroom C

**21.5 Sponsor Seminar: ScienceEdge • Tomoya Yuchiyama** (9:50 – 10:05 a.m.)
*Laser-scanning FDTR microscopy for spatial and anisotropic thermal conductivity characterization*

### Coffee Break

10:05 a.m. – 10:30 a.m. • Imperial Foyer – Level 3

### Invited & Contributed Talks

10:30 a.m. – 12:40 p.m. • Imperial Ballroom – Level 3

Session 22: Nanoscale & Low-Dimension Induced Effects • Ballroom A

Session 23. Bulk Devices–I • Ballroom B

Session 24. Physical Properties–II • Ballroom C

## Lunch On Your Own

### Exhibits Open

8:00 a.m. - 12:00 p.m.• Market Place, Lower Level

## Social Functions

### Space Center Houston (SCH) ICT Outing & Banquet; ITS Awards

Buses depart at **2:15**, corner of Smith & Louisiana Streets. Meet in Hyatt Lobby at 2:00.
(ICT badge required for boarding and admittance to SCH. See Flyer below.)

## Committee and Business Meetings

### ITS Board Meeting

11:00 a.m. – 12:00 p.m. • Dogwood, Level 3

### Elsevier Meeting

12:00 p.m. – 2:00 p.m. • Dogwood, Level 3

# Thursday, May 21, 2026

## Conference Activities

### Registration

7:30 a.m. – 1:00 p.m. • Imperial Ballroom Foyer, Level 3

### Speaker Ready Room

7:30 p.m. – 5:00 p.m. • Magnolia Room, Level 3

*Upload presentations from USB any time, but at least three hours in advance*

## Concurrent Sessions

### Invited & Contributed Talks

8:30 a.m. – 10:10 p.m. • Imperial Ballroom – Level 3

Session 25: Nano/Microstructures • Ballroom A

Session 26. Theoretical Study of Bulk Materials–II • Ballroom B

Session 27. Organic & Hybrid Materials • Ballroom C

### Coffee Break

10:10 a.m. – 10:35 a.m. • Imperial Foyer – Level 3

### Invited & Contributed Talks

10:35 a.m. – 12:00 p.m. • Imperial Ballroom – Level 3

Session 28. Other Thermoelectric Materials • Ballroom A

Session 29. Celebration of Professor Joseph Heremans' Scientific Contributions–I • Ballroom B

Session 30. Silicides • Ballroom C

## Lunch

### Buffet Lunch | Exhibits Open

12:00 p.m. – 1:00 p.m. • Market Place, Lower Level

## Concurrent Sessions

### Invited & Contributed Talks

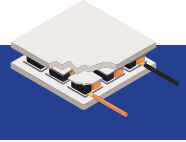
1:00 p.m. – 2:15 p.m. • Imperial Ballroom – Level 3

Session 31. Bulk Devices–II • Ballroom A

Session 32. Celebration of Professor Joseoh Heremans' Scientific Contributions–II • Ballroom B

Session 33. Pnictides and Chalcogenides–I • Ballroom C





### Coffee Break

2:15 p.m. – 2:40 p.m. • Imperial Foyer – Level 3

### Invited & Contributed Talks

2:40 p.m. – 4:40 p.m. • Imperial Ballroom – Level 3

Session 34. Other Material-Related Topics–II • Ballroom A

Session 35. Thin Film Devices • Ballroom B

Session 36. Pnictides and Chalcogenides–II • Ballroom C

## ITS Awards Talks

4:40 p.m. – 5:20 p.m. • Imperial Ballroom – Level 3

### ITS Postdoctoral Award – Fabian Garmroudi (TU Wien)

*Designing Electronic Structures for Ultrahigh Power Factors*

4:25 p.m. – 5:00 p.m. • Imperial Ballroom B

### ITS Outstanding Achievement Award – Gang Chen (Massachusetts Institute of Technology)

*A Journey in Thermoelectric Research*

4:45 p.m. – 5:20 p.m. • Imperial Ballroom B

## Concluding Remarks

**Closing Ceremony** • 5:20 p.m. – 5:40 p.m.

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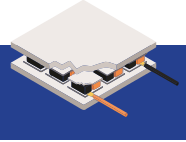


# EVENTS AT A GLANCE

## Sunday, May 17, 2026

### ITS Thermoelectrics Summer School

1:00 p.m. – 4:30 p.m. • Regency Room – Level 2

Pre-registration is required for the Summer School. Badges will be available at the conference registration counters in the Imperial Ballroom Foyer on Level 3 at 11:00 a.m. prior to the event.

## Monday, May 18

### Student/Young Professional Networking Event

7:30 p.m. – 9:00 p.m. • Hyatt – Level 6, Pool Deck

Registrants who indicated an interest in this informal networking event will receive a ticket in their registration packets.

## Monday/Tuesday, May 18-19, 2026

### 2026 Poster Competition

5:30 p.m. – 7:00 p.m. • Market Place, Lower Level

Poster Session 1 (Monday) and Poster Session 2 (Tuesday) will be held in the Market Place. Prizes will be awarded for the top presentations. Judges will base decisions on Clarity (20), Scientific Merit (30), Innovation (20), Presentation/Visuals (15), and Q&A/Engagement (15). Winners will be announced at the ITC awards ceremony on Wednesday evening at Space Center Houston.

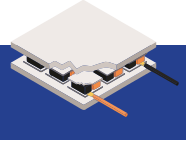
## Wednesday, May 20, 2026

### ICT Outing and Banquet • ITS Awards Ceremony

Event time: 3:00 p.m. – 10:00 p.m. • Space Center Houston

2:15 p.m. Buses depart Hyatt. Look for guides with signs in hotel lobby.





## 2026 ITS Summer School at ICT2026 Houston

We are pleased to host the 2026 ITS Summer School on Sunday, May 17, 2026, immediately preceding the 42nd International Conference on Thermoelectrics (ICT 2026). The conference will take place at the Hyatt Regency Houston Downtown Houston in Houston, Texas USA from Monday, May 18 through Thursday, May 21. The ITS Summer School, which requires advance registration, is a valuable opportunity to educate researchers about thermoelectrics, particularly students, postdoctoral fellows, and senior attendees who are new to the field or seeking latest updates. We gratefully acknowledge the generous sponsorship of the Jiang Family Foundation and MTI Corporation for supporting the Thermoelectric School.

Chair: **Professor Mona Zebarjadi**, University of Virginia

**SCHEDULE**

**Sunday, May 17** Regency Room – 2nd Level

| | |
|---|---|
| 1:00-1:10 | **Professor Takao Mori**, ITS President, Opening & Introductions |
| 1:10-1:50 | **Dr. Chengyi Wu**, MTI Corporation, "The Introduction of Thermoelectrics Synthesis: from Traditional Power Metallurgy to Automated Platform" |
| 1:50-2:30 | **Dr. Christopher Caylor**, DTP Thermoelectrics, "Distributed Transport Properties (DTP) to Address Limitations in Thermoelectric Cooling Efficiency and Heat-pumping Capacity" |
| 2:30-2:50 | Break |
| 2:50-3:30 | **Professor Renkun Chen**, University of California San Diego, "Thermal Management for Thermoelectrics: Heat Dissipation Techniques for TEG and TEC from Natural Convection to Phase Change" |
| 3:30-4:10 | **Professor Masato Yoshiya**, The University of Osaka, Japan, "Computational Approaches More than Simulations to Go Beyond Theories for Thermoelectrics" |
| 4:10-4:30 | Q&A with Speakers |

# PLENARY SESSIONS

## TAKAO MORI

Field Director, Research Center for Materials Nanoarchitectonics (MANA), National Institute for Materials Science (NIMS)

### *Development of High-Performance Thermoelectric Materials & Modules for Power Generation and Cooling*

**Monday, May 18**
**8:40 – 9:15 a.m.**

We have been utilizing novel routes such as magnetism, Anderson localization, etc. and advancing defect engineering, to develop new high performance thermoelectric materials. As a result, we have succeeded in developing materials and modules that surpass the half-century champion $Bi_2Te_3$-type. Electrode technologies for these new materials were also developed, with a novel concept of "active electrodes" leading to high stability and enhancement of the device performance than previously achieved. This strategy was also utilized for diffusion barrier materials. Effective methodology for designing high performance thermoelectric modules (TEGs) has also been developed and will be presented. The accurate evaluation of performance of actual devices is critical for the industrialization of the technology, and we have also laid out the best practices for evaluation of TEGs. I will also present advancements made in fabrication of various formats of TEGs: bulk, thin film, flexible. Peltier devices of novel materials have also been fabricated and tested. Processes suited to industrial and mass production are important, as are development of compatible thermal management technologies, which will be presented. The progress of thermoelectric applications will also be discussed.

### About Takao Mori

Takao Mori received his Ph.D. from the University of Tokyo, Department of Physics. He is a Field Director at the National Institute for Materials Science (NIMS) and a Professor at the University of Tsukuba Graduate School, and elected Board Member and current President of the International Thermoelectric Society (ITS). Mori's research interests are to find ways to control structures and properties of inorganic materials. He is especially involved in development of thermoelectric materials and multidisciplinary enhancement principles, such as utilizing magnetism, to find new routes to achieve high control over band structures and electrical and thermal transport. Furthermore, he works on thermoelectric devices, modules and thermal management technology for applications. Mori is a Senior Editor of *Materials Today Physics*, Advisory Board Member of *JSSC*, J. *Materiomics*, *Joule*, and *Device.* He is also a Program Manager of the JST Mirai Large-scale Program.

# PLENARY SESSIONS

## KORNELIUS NIELSCH

Director, Institute for Metallic Materials (IMW), Leibniz Institute for Solid State Materials Research Dresden (IFW)

### *From Interface Modifications of Thermoelectric Materials towards Sustainable Modules*

**Monday, May 18**
**9:15 – 9:50 a.m.**

In thermoelectric materials, phase boundaries are crucial for carrier and phonon transport. In ZnSb and $Ag_2Se$, metal ion migration under operational gradients triggers irreversible decomposition. Although β-$Zn_4Sb_3$ possesses high TE performance, it suffers from Zn-ion migration under thermal gradients. Through precise ZnO coating, we create continuous sub-nanometer barriers that immobilize interstitial Zn ions and inhibiting phase decomposition. The thermal stability of the ZnO coated sample persists through 40k thermal cycles, and the Seebeck coefficient mapping exhibits a uniform distribution along the temperature gradient. Furthermore, commercial thermoelectric modules have relied on $Bi_2Te_3$-based compounds because of their unparalleled thermoelectric properties at temperatures associated with low-grade heat (<550 K). However, the scarcity of elemental Te greatly limits the applicability of such modules. We report on the performance of thermoelectric modules assembled from p-type MgAgSb and n-type $Mg_3(Sb,Bi)_2$. For a temperature difference of ˜250 K, a single-stage module displayed a conversion efficiency of ˜8.5%, whereas a module using segmented n-type legs displayed a record efficiency of ˜8.2% that is comparable to the state-of-the-art $Bi_2Te_3$-based thermoelectric modules. The extraordinary thermal stability of the thermoelectric modules based on MgSb alloys is achieved by coating the whole thermoelectric module with $HfO_2$ and $SiO_2$ by using atomic layer deposition.

## About Kornelius Nielsch

Kornelius Nielsch has been Director of the Institute for Metallic Materials (IMW) at the Leibniz Institute for Solid State and Materials Research Dresden (IFW) since 2015, where he leads a research group working on sustainable thermoelectric materials and devices for thermoelectric cooling. Professor Nielsch received his diploma in physics from the University of Duisburg in 1997 and his Ph.D. in physics from Martin Luther University Halle-Wittenberg, Germany, in 2002. From 2002 to 2003, he was a postdoctoral fellow at MIT after which he took up the position of group leader at the Max Planck Institute for Microstructure Physics in Halle, Germany, in 2003. He then moved to the Institute of Applied Physics at the University of Hamburg, where he served as Professor of Experimental Physics from 2007 to 2015. From 2009 to 2015, he coordinated the Priority Program on Nanostructured Thermoelectrics, and he is currently coordinating the Marie Curie Doctoral Network on Mg-based alloys for thermoelectric cooling in collaboration with 15 partner institutions across Europe.

# PLENARY SESSIONS

## LUCAS LINDSAY

Research Scientist, Materials Science and Technology Division, Oak Ridge National Laboratory

### *Boron Arsenide for Heat Management: From Phonons to Devices*

**Monday, May 18**
**10:20 – 10:55 a.m.**

Effective heat management is a defining constraint across technologies, from climate-scale systems to microelectronic hotspots. While thermoelectrics often target ultralow lattice thermal conductivity k, advanced thermal management demands materials with ultrahigh k, a substantially harder design target. Indeed, high k materials are critical for efficiently getting heat to and from thermoelectric modules and maintaining their optimal temperature differences. Here, I will present details behind the prediction, synthesis, and device-level integration of an emergent benchmark high-k semiconductor, Boron Arsenide (BAs), with a room temperature k on the order of 1000s W/m/K. I will highlight how intrinsic and extrinsic phonon-scattering mechanisms shape k in BAs, guiding integration pathways for thermal management, including design of interfacial properties and device-level hotspot mitigation. Finally, I will discuss future directions in wafer-scale synthesis, defect engineering, and reliability to frame a practical roadmap to transition BAs from exceptional material to mainstream thermal solutions.

### About Lucas Lindsay

Lucas Lindsay received a B.S. degree in physics from the College of Charleston in 2004. He completed his Ph.D. work on theoretical thermal transport in carbon nanostructures at Boston College and earned his doctorate in 2010. He taught physics for two years at Christopher Newport University and then spent three years as a National Research Council Postdoctoral Fellow at the U.S. Naval Research Laboratory in Washington, D.C. He has been a research scientist in the Materials Science and Technology Division at Oak Ridge National Laboratory since 2014. He received the Department of Energy Early Career Award in 2019. His research focuses on the theoretical description of vibrational and transport properties of condensed matter.



# ICT Outing and Banquet
# ITS Awards Ceremony
## Wednesday, May 20, 2026

- We will travel by charter bus to Space Center Houston (SCH), gateway to the NASA/JSC complex, for private access to all exhibits. The outing begins with a VIP Tram Tour to the Saturn Rocket Park and Space Vehicle Mockup Facility, followed by cocktails in Independence Plaza with Space Shuttle access.
- The ICT Banquet by renowned caterer Wolfgang Puck will follow in the heart of SCH, Main Plaza. The ITS Awards will be presented after dinner, and upon conclusion guests can stroll through indoor exhibits and visit the unique gift shop, Space Traders, open exclusively to ICT participants.
- Buses depart from the Hyatt for SCH at **2:15 p.m.** from Smith & Louisiana Streets and return between 9:30 – 10:00 p.m. ICT guides will be holding signs in the lobby.
- Conference badges **must** be worn for bus transportation and SCH admission. Backpacks are not allowed. Dress is business casual, with comfortable shoes.
- Participants who indicated dietary modifications/allergies will have a card in their badge holders to show the wait staff.

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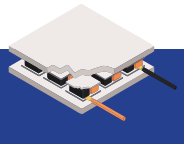

# EXHIBITORS

ICT 2026 is pleased to welcome the following exhibitors to Houston! Visit them in the Hyatt Market Place on the Lower Level to learn more about their programs and explore potential collaborations throughout the conference. Exhibitors will attend the technical sessions as participants, so look for their badges. Exhibitor booths are located adjacent to the Lunch Buffets (Monday, Tuesday, Thursday) and the Poster Sessions (Monday, Tuesday). https://www.ict2026houston.com/Pages/exhibitors.html

**Across International**
https://www.acrossinternational.com/

**Fourier Scientific**
https://www.fourierscientific.com/

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# ABOUT THE ORGANIZERS

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ICT 2026 was organized by the Texas Center for Superconductivity at the University of Houston (TcSUH) and co-sponsored by the Office of the Provost, Division of Research, College of Natural Sciences and Mathematics, Department of Physics, Department of Chemistry, and UH Energy. We are thankful for their support and are particularly grateful to the business and IT administrators in the College of Natural Sciences and Mathematics.

**About $T_c$SUH**: TcSUH is a university-based superconductivity and advanced materials research center in Houston, Texas. Over 200 faculty, postdoctoral fellows, graduate and undergraduate students, and visiting scholars from five departments work to discover and improve new materials, advance science and engineering, and transfer breakthroughs in technology to the industrial sector, impacting the emerging HTS electric power community, the space and medical communities, and other sectors.

**About UH:** The University of Houston is a powerhouse of innovation, learning and discovery in the nation's fourth-largest city and one of the world's most dynamic regions. Founded in 1927, UH is the largest public research university in Houston and the third largest in Texas, serving nearly 49,000 students across its flagship campus in Houston and campuses in Katy and Sugar Land. Through 16 colleges, the University offers more than 300 academic programs, preparing leaders for the global economy. UH is one of the most culturally dynamic major research universities in the nation. With state-of-the-art facilities such as the Technology Bridge innovation hub and UH's Arts and Health Districts, UH drives discovery, fosters creativity, promotes health and education, and transforms communities locally and globally. drives discovery, fosters creativity, promotes health and education, and transforms communities locally and globally.