SEMI-THERM® 2026

The 42nd Annual Thermal Measurement, Modeling and Management Symposium

KEEPING TECHNOLOGY COOL

March 9 - 12, 2026

SEMI-THERM.ORG

Navid Kazem
General Chair - Arieca

Dear Colleagues,

Welcome to SEMI-THERM 42, our annual symposium dedicated to the thermal management and characterization of electronic components and systems. For decades, SEMI-THERM has served as the premier forum for industry and academia to exchange ideas, showcase innovation, and advance thermal engineering. As General Chair, I am honored to bring together our global community of engineers, researchers, and technology leaders.

With thermal engineering taking a central role in today's transformative technologies, this year's program reflects the current challenges and opportunities. We have assembled a strong technical program featuring an inspiring keynote, high impact technical presentations and posters, a panel discussion, vendor workshops, and hands-on short courses. Under the theme, "Thermal Innovations that Keep the World's Technology Cool", sessions cover topics from emerging cooling solutions for high-performance computing and data centers to advances in thermal materials, testing, and modeling. We also continue our tradition of recognizing excellence through the Best Paper & Poster Awards, the Thermi Award, the Harvey Rosten Award, and the Thermal Hall of Fame Award.

This year, we introduce several new initiatives. In response to strong technical submissions, we are adding an interactive poster session during the exhibition. We are also inaugurating the "Thermal FUTURES Scholarship" to support student research presentations and foster the next generation of thermal engineers. Additionally, we will host a dedicated session honoring Robert Moffat and Clemens Lasance for their lasting contributions to our field and to SEMI-THERM.

A special thank you goes to our Program Chair, Dr. Claire Wemp (Qnity), and our Vice Program Chair, Dr. Mohamad Abo Ras (Nanotest), as well as our Topic Champions, dedicated reviewers, and the entire SEMI-THERM committee for their tireless efforts in organizing this outstanding symposium. I am also deeply grateful to our sponsors and exhibitors for their invaluable support. Finally, thank you to all of you, our attendees, for making SEMI-THERM such a vibrant and impactful community.

I hope SEMI-THERM 42 inspires meaningful discussions and lasting collaborations.

Navid Kazem,
General Chair, SEMI-THERM 42

Personnel

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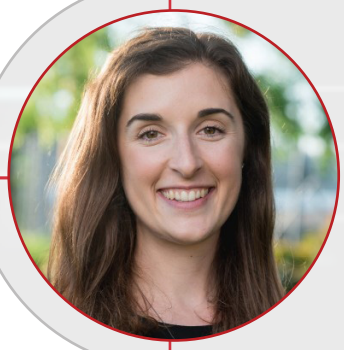
Navid Kazem

General Chair - Arieca



Claire Wemp

Program Chair - Qnity

Mohamad Abo Ras

Program Vice Chair - Nanotest

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Session Chairs	Sessions
Navid Kazem, Arieca (Chair) Lochan Sai Reddy Chinthaparthy, University of Texas, Arlington (Co-Chair)	High Performance Computing
Heng Wang, Linseis (Chair) Mehdi Mehrabikermani, Villanova (Co-Chair)	TIM Session I
Ross Wilcoxon, Collins Aerospace (Chair) Nick Rael, Collins Aerospace (Co-Chair)	TIM Session II
Mohamad Abo Ras, Nanotest (Chair) Antonio Harder, Nanotest (Co-Chair)	Testing & Measurement
Sonia Gupta, Nokia (Chair) Akiilessh Sivakumar, University of Texas, Arlington (Co-Chair)	Liquid Cooling

Personnel

Session Chairs	Sessions
Sai Kiran Hota, Advanced Cooling Technologies (Chair) Omar Al-Zu'bi, Binghamton University (CoChair)	Assorted Topics
Manish Vankudre, AMD (Chair) Dave Saums, DS&A (Co-Chair)	Modeling Session I
Ghazal Mohsenian, Advantest (Chair) Reza Goharimehr, Villanova (Co-Chair)	Modeling Session II
Alfonso Ortega, Villanova (Chair)	Bob Moffat & Clemens Lasance Memoriam

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Thermal Futures sponsors make it possible for student authors to attend and present at SEMI-THERM by funding registration and travel expenses. **This year, sponsorship support enabled six student engineers to participate**—sharing their research, engaging with industry professionals, and gaining direct exposure to real-world thermal challenges.

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Short Courses

Monday, March 9

7:00 AM - 12:00 PM • REGISTRATION OPEN • San Jose & Santa Clara

8:00 AM - 12:00 PM
San Jose & Santa Clara

Direct to Chip Liquid Cooling in Data Centers with Pumped Two-Phase Refrigerants: Fundamentals and Design Practices

Presented by: Alfonso Ortega, Villanova University

The course will be useful for engineers who want to better understand the physics, the engineering thermo-fluid models and methodologies, and the available empirical evidence for two-phase pumped refrigerant cooling through cold plate based systems including cold plate and rack systems.

10:00 AM - 10:20 PM
Break

8:00 AM - 12:00 PM
Carmel

Two-Phase Science Becoming Reality: Discover Real Use Cases which are Shaping Tomorrow's Thermal World

Presented by: Olivier de Laet and Hülya Geçim, Calyos

This session will explore how current two-phase cooling technologies are addressing the myriad of evolving thermal management needs of modern personal computers, energy and digital infrastructures, advanced spacecraft systems, and next-generation automotive components.

10:00 AM - 10:20 PM
Break

12:00 PM - 1:00 PM • LUNCH • Gateway Foyer

1:00 PM - 5:00 PM
Carmel

Efficient Thermo-Mechanical Simulations Using Compact Models

Presented by: Prof. Tamara Bechtold, Jade University, Germany

Heat is generated in almost all technical processes. For example, the integration density in modern electronic systems is so high that their performance is limited by cooling. Microelectronic reliability depends on thermo-mechanical properties of packages. Highly integrated batteries of hybrid electrical vehicles depend on cooling.

3:00 PM - 3:20 PM
Break

Short Courses

Monday, March 9

1:00 PM - 5:00 PM
Monterey

Thermal Contact Resistances and Thermal Interface Materials

Presented by: Ross Wilcoxon, Collins Aerospace

All physical systems include interfaces between bodies in contact with each other. If there is power dissipation or there are temperature gradients, these thermal interfaces will add thermal resistance to the flow of heat. These thermal interfaces can be difficult to accurately predict and can have a significant impact on the thermal behavior of a system.

3:00 PM - 3:20 PM
Break

12:00 PM - 5:00 PM • Exhibitor Move-In • Registration

Microsanj Open House • Monday, March 9 • 6:30 PM - 8:30 PM

Join us the evening before the workshop for an interactive showcase of Microsanj's transient thermoreflectance systems, IR/OpenTEST platform demonstrations, with hands on stations staffed by Microsanj experts and partner MPI.

The Open House includes a special talk by Dr. Ali Shakouri on "Nanoscale Thermal Transport and Characterization for Heterogeneous Integration," themed discussion corners on GaN/WBG power, 3DHI packaging, and RF/mmWave/THz, and light refreshments.

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RSVP Required: microsanj.com/microsanj-open-house

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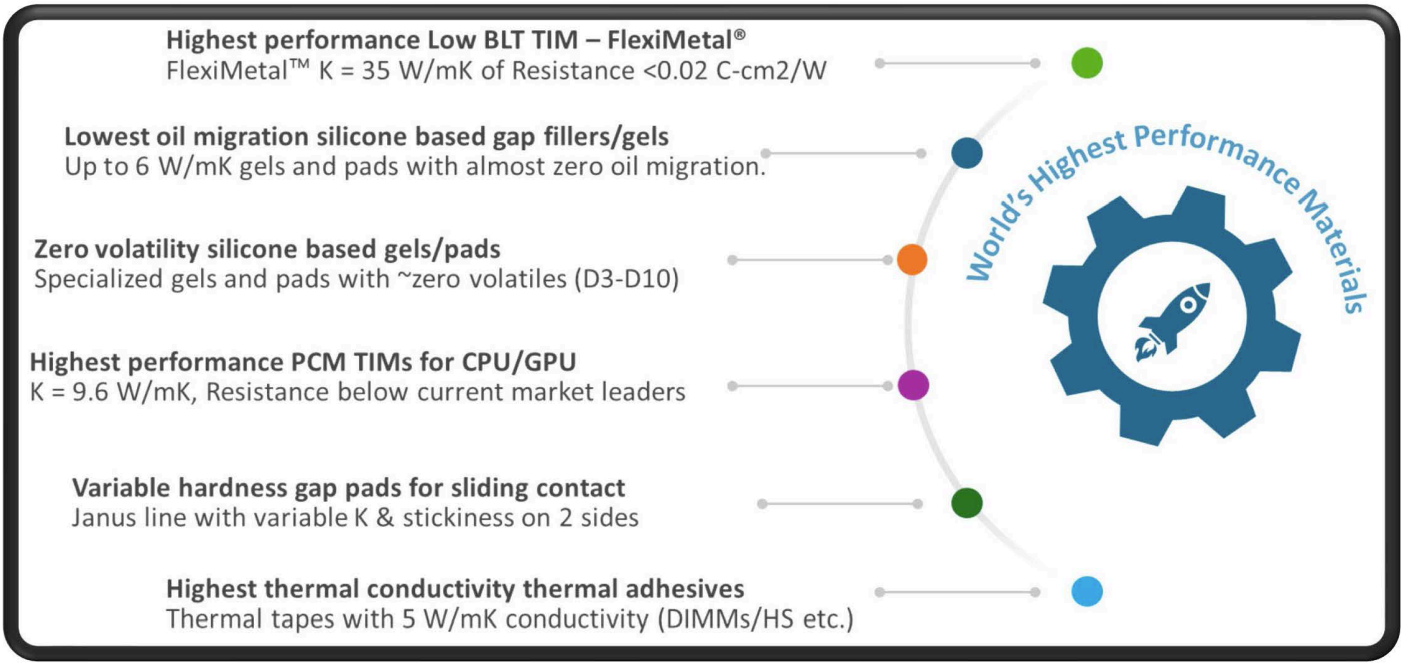

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Conference Schedule

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Time/Rooms	Tuesday, March 10 Sessions
7:00 AM - 6:00 PM	**REGISTRATION OPEN • Bayshore Foyer**
8:10 AM - 8:20 AM **Oak & Fir**	**GENERAL CHAIR WELCOME** - Navid Kazem, Arieca
8:20 AM - 8:40 AM **Oak & Fir**	**High Performance Computing: Dynamic Rack-Level Direct-to-Chip Liquid Cooling with Adaptive Flow and Pumping for Enhanced Energy Efficiency and IT Reliability** Akiilessh Sivakumar, University of Texas, Austin
8:40 AM - 9:00 AM **Oak & Fir**	**High Performance Computing: Thermal Performance of PHP Heat Spreader at Central and Non-Central Heat Load Configuration** Sai Kiran Hota, Advanced Cooling Technologies
9:00 AM - 9:20 AM **Oak & Fir**	**High Performance Computing: Cold Plate Study for Liquid Cooling of Co-Packaged Optics (CPO)** Albert Chan, Cisco Systems
9:20 AM - 10:00 AM **Oak & Fir**	**Keynote: Scaling Data Centers with Light** Sagi Mathai, Hewlitt Packard Enterprises
10:00 AM - 10:20 AM	**BREAK**
10:20 AM - 10:40 PM **Oak & Fir**	**TIM: Accelerated Evaluation of TIM Pump-Out Testing Using a Controlled Thermal Test Vehicle Platform** Andrew Bott, DOW Chemical
10:40 AM - 11:00 PM **Oak & Fir**	**TIM: Measuring Burn-In for Advanced Phase Change Thermal Interface Materials** Anastasia Patterson, Shourya Jain, Qnity
11:00 AM - 11:20 PM **Oak & Fir**	**TIM: Investigation of Pump-Out-Induced Degradation of TIM1 using a Lidded Thermal Test Vehicle under Active Power Cycling** Mohamad Abo Ras, Nanotest
11:20 AM - 11:40 PM **Oak & Fir**	**TIM: Thermal Performance Evaluation of TIM 1.5 Under Large TTV Warpage** Navid Kazem, Arieca; Shourya Jain, Qnity
11:40AM - 12:00 PM **Oak & Fir**	**TIM: Understanding Indium Oxidation and Its Impact on Precision Applications** Jim McCoy, Indium
12:00 PM - 1:20 PM **Pine & Cedar**	**Lunch: Thermal Futures Winners & Procedural Artworks from Heat Equations and Japanese Embroidery** Bjorn Vermeersch, imec

Conference Schedule

Time/Rooms	Tuesday, March 10 Sessions
1:30 PM - 6:00 PM **Bayshore Ballroom**	**EXHIBIT HALL OPEN**
2:00 PM - 2:45 PM **Oak Room**	**Exhibitor Workshop:** **The Future Roadmap of Thermal Management for Next-Generation AI Electronics** Solstice
2:00 PM - 2:45 PM **Fir Room**	**Exhibitor Workshop:** **Learning Through Data: Practical Considerations for Blindmate Specification** CPC
3:00 PM - 4:45 PM **Fir Room**	**Exhibitor Workshop:** **Advanced Thermal Analysis Solutions for High Power and Heterogeneous Packages** microsanJ
3:00 PM - 3:45 PM **Oak Room**	**Exhibitor Workshop:** **Lowering Thermal Resistance with Pumped Liquid Metal to Extend Air- and Liquid-Cooled HPC System Limits** MoltenDynamics Precision Cooling. Unmatched Performance.
4:00 PM - 4:45 PM **Oak Room**	**Exhibitor Workshop:** **Comprehensive TIM Characterization: Pairing Traditional TIM Testing with Transient Plane Source Methods** C-THERM
6:00 PM - 7:00 PM **Pine & Cedar**	**DINNER + HARVEY ROSTEN AWARD** See page 29 for award details.

Conference Schedule

Time/Rooms	Tuesday, March 10 Sessions
7:00 PM - 8:30 PM **Oak & Fir**	**Panel Discussion: Advanced Materials for Thermal Management in High-Performance Computing – Focus on Diamond Integration** Panelists: 1. Prof. Srabanti Chowdhury (Stanford University) 2. Rob Murano (Coherent) 3. Russell Kempt (Diamond Foundry) 4. Dr. Sam Vaziri (TSMC) 5. Melanie Beauchemin (Google) 6. Dr. Jeremy Turcaud (Element Six) Moderator: Dr. Navid Kazem (Arieca), Dr. Mohamad Abo Ras (Nanotest) As AI and other data-intensive workloads continue to push the boundaries of computing performance, managing heat in high-density systems has become more critical than ever. This panel will explore the frontiers of advanced materials for thermal management in high-performance computing (HPC), with a special focus on diamond-based solutions. With exceptional thermal conductivity, diamond and diamond-based materials hold great promise for applications such as heat sinks, interposers, heat spreaders, and even substrates, offering a path to mitigate hotspots and enhance cooling in next-generation compute architectures. A panel of leading experts from academia, industry, and national laboratories will discuss the technical and practical challenges of adopting diamond and diamond-based materials in thermal management. The session will cover materials, processing, integration, and characterization, as well as considerations around cost, scalability, and the industrialization of these extraordinary materials. Moderated by two thermal management specialists, the session will feature interactive discussion and audience Q&A, offering attendees deep insights into both the potential and the practical realities of deploying advanced thermal materials in the era of AI and accelerated computing.

Conference Schedule

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Time/Rooms	Wednesday, March 11 Sessions
7:00 AM - 6:00 PM	**REGISTRATION OPEN • Bayshore Foyer**
8:10 AM - 8:20 AM **Oak & Fir**	**PROGRAM CHAIR WELCOME** - Claire Wemp, Qnity and Mohamad Abo Ras, Nanotest
8:20 AM - 8:40 AM **Oak Room**	**Modeling: Surrogate Modeling of Vapor Chambers for Real-Time Thermal Prediction** Azita Soleymani, HeatSync
8:20 AM - 8:40 AM **Fir Room**	**TIM: Influence of Surface Roughness on the Thermal and Reliability Performance of Thermal Interface Materials** Antonio Harder, Nanotest
8:40 AM - 9:00 AM **Fir Room**	**TIM: Investigation of Oil Spreading (Bleed) from Thermal Interface Materials** Shourya Jain, Qnity
8:40 AM - 9:00 AM **Oak Room**	**Modeling: Fast Multiscale Thermal Simulation of Large SoCs down to Sub-Nanometer Transistor Channel Detail through Iterative Selective Resolution Refinement** Bjorn Vermeersch, imec
9:00 AM - 9:20 AM **Oak Room**	**Modeling: Thermodynamic Optimization of Microfluidic Heat-sinks via Entropy Generation Minimization (EGM) Approach** Pramod Vishwakarma, University of Limerick
9:00 AM - 9:20 AM **Fir Room**	**TIM: Breakdown of Thermal Resistance in The Heat Transfer Path of Microprocessors by Utilizing Thermal Network** Koji Nishi, Ashikaga University
9:20 AM - 9:40 AM **Oak Room**	**Modeling: FD Analysis of High-Power Processor Cooling Using SiC–Diamond and CVD Diamond Microchannel Spreaders under Varied Fin Structures and Flow Paths** Abtin Ataei, Coherent
9:20 AM - 9:40 AM **Fir Room**	**TIM: Demonstration of the performance, design and inspection criteria employed for aligned carbon nanotube thermal interface materials in die to lid attach applications** Craig Green, Carbice
9:40AM - 10:00 AM **Oak Room**	**Modeling: Development of a Flow Network Modeling Approach for End-To-End Data Center Direct To Chip Two-Phase Cooling Systems** Reza Goharimehr, Villanova
9:40 AM - 10:00 AM **Fir Room**	**TIM: Phase Change–Liquid Metal Elastomer Composites as Multifunctional Thermal Interface Materials** Andrea Mikulášová, University of Nebraska - Lincoln

Conference Schedule

Time/Rooms	Wednesday, March 11 Sessions
10:00 AM - 10:20 AM	**BREAK**
10:20 AM - 10:40 AM **Oak Room**	**Modeling: Numerical Simulation Study on Thermal Analysis and Current Derating of Automotive LED Modules** Chulwoo Lee, Mobis
10:20 AM - 10:40 AM **Fir Room**	**Liquid Cooling: Experimental Investigation of Heat Transfer in Skived Fin Cold Plates with Split-Flow Jet Impingement Two-Phase Refrigerant Boiling** Cole Richards, Villanova University
10:40 AM - 11:00 AM **Oak Room**	**Modeling: A Reduced-Order Model for Thermal Analysis of Power Electronics Modules** Shihu Ma, Ansys
10:40 AM - 11:00 AM **Fir Room**	**Liquid Cooling: Active Thermal Management of a Device Under Test via Direct-to-Silicon Submerged Liquid Jet Impingement** Samaun Nili, Intel
11:00 AM - 11:20 AM **Oak Room**	**Modeling: Effect of Reduced Order Models on Computational Efficiency and IP Protection of Thermo-Mechanical Models for Package-Board Design** Chengzhe Lyu, Dresden University of Technology
11:00 AM - 11:20 PM **Fir Room**	**Liquid Cooling: Experimental Evaluation of Flow Restrictors for Mitigating Instabilities in Rack-Level Two-Phase D2C Cooling Systems** Mehdi Mehrabikermani, Villanova University
11:20 AM - 11:40 PM **Oak Room**	**Modeling: Viscoelastic Modeling of Thermal Interface Materials** Lindsay Shaffer, Parker Chomerics
11:20 AM - 11:40 PM **Fir Room**	**Liquid Cooling: End-to-End Microfluidic Cooling: From Design and Prototype to Testing** Remco Van Erp, Corintis
11:40 AM - 12:00 PM **Oak & Fir**	**Poster Introductions** 1. Comparison of Heat Spreading Performance of Ultra-Thin Vapor Chamber and Graphite Sheet on Smart Phone Display using the Non-Contact Measurement Method, Kuang-Yu Hsu, T-Global 2. Reliable Thermal Transfer Using Knitted Copper Cushions Under Variable Mechanical Pressure, Ruediger Schroth, Hutchinson Stop-Choc GmbH 3. Is it hot in here, or is it just me? Tackling thermal challenges during an AI-driven data explosion, Brian Crumpston, Ventiva (continued on next page)

Conference Schedule

Time/Rooms	Wednesday, March 11 Sessions
11:40 AM - 12:00 PM	**Poster Introductions (continued)** 4. Integrated Oscillating Heat Pipe Cold Plate for High-Performance Processors, Corey Wilson, ThermAvant 5. PCB Integration of Liquid Cooling, Thilo Vethake, Trumpf Photonics
12:00 PM - 1:20 AM **Pine & Cedar**	**LUNCH BREAK + THERMI AWARD** See award winner details on page 27
1:30 PM - 6:00 PM **Bayshore Ballroom**	**EXHIBIT HALL OPEN** Exhibitor Reception 5:00 PM - 6:00 PM
2:00 PM - 2:45 PM **Oak Room**	**Exhibitor Workshop: Key Challenges of Implementing Liquid Cooling at Scale and How to Minimize Them.**
2:00 PM - 2:45 PM **Fir Room**	**Exhibitor Workshop: The Future of Thermal Design - Examples of Replacing Iterations with Generative Design Discovery**
3:00 PM - 3:45 PM **Oak Room**	**Exhibitor Workshop: Rethinking TIM Testing: Beyond Thermal Conductivity to What Really Matters**
3:00 PM - 3:45 PM **Fir Room**	**Exhibitor Workshop: Celsius Studio: Accelerating Intelligent Thermal Solutions for Modern Electronics**
4:00 PM - 4:45 PM **Oak Room**	**Exhibitor Workshop: MOSTCOOL: A Modular Platform for Data Center Cooling Design and Trade Studies**
5:00 PM - 6:00 PM **Bayshore Foyer**	**Poster Presentation** (reference poster introductions @ 11:40 AM) Kuang-Yu Hsu, Brian Cumpston,Corey Wilson, Ruediger Schroth, Thilo Vethake
5:00 PM - 6:00 PM **Bayshore Ballroom**	**Exhibitor Reception** All attendees & exhibitors are welcome
6:30 PM - 8:30 PM • QNITY OPEN HOUSE • RSVP Required During Attendee Registration	
965 W Maude Ave, Sunnyvale, CA 94085	Explore open lab spaces and discover the latest advancements in application testing equipment. You'll also have the opportunity to tour our full innovation center, showcasing groundbreaking technologies.

Conference Schedule

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Time/Rooms	Thursday, March 12 Sessions
7:00 AM - 6:00 PM	**REGISTRATION OPEN • Gateway Foyer**
8:10 AM - 8:20 AM **Oak & Fir Room**	**Program Chair Welcome:** Mohamad Abo Ras, Vice Program Chair Claire Wemp Claire Wemp, Program Chair
8:20 AM - 8:40 AM **Oak Room**	**Testing & Measurement: Measurement of Thermal Contact Resistance using a One-Dimensional Transient Plane Source Configuration** David Landry, Thermtest
Fir Room	**Assorted Topics: Digital Twin for Two-Phase High-Density Computing Data Center: System-Level Experimental Dataset and Manual Component Characterization for Pumped Two-Phase Rack Cooling** Omar Alzubi, Binghamton University
8:40AM - 9:00 AM **Oak Room**	**Testing & Measurement: Absolute and Relative Temperature Measurements by Transient Gate Resistance Thermometry and Transient Thermoreflectance Imaging** Georges Pavlidis, University of Connecticut
Fir Room	**Assorted Topics: Influence of Surface Finish on Copper Corrosion in Propylene Glycol-Based Direct-to-Chip Coolants for Data Centers** Sreya Dutta, Dynalene
9:00AM - 9:20 AM **Oak Room**	**Testing & Measurement: Thermal Interface Material Characterization Using Thermo-Optical Plane Source Measurements: Thermal Conductivity and Thermal Conductance Mapping** Jeffrey Braun, Laser Thermal
Fir Room	**Assorted Topics: µCooling: A New Tool for Microelectronics Thermal Management** Thomas Tarter, xMEMS Labs
9:20AM - 9:40 AM **Oak Room**	**Testing & Measurement: Simultaneous Estimation of Interfacial and Bulk Thermal Resistances in Thermal Interface Materials with Si Substrates under Controlled Uniaxial Pressure Using Lock-in Thermograp** Kota Hasegawa, Resonac
Fir Room	**Assorted Topics: Optical Pump Probe Technique with Thermoreflectance Imaging Addresses Thermal Analysis Challenges with Multilayer Structures** Mo Shakouri, Microsanj
9:40AM - 10:00 AM **Oak Room**	**Testing & Measurement: Mapping of Out-of-Plane Thermal Diffusivity in Diamond Composites via Undersampling Lock-in Thermography** Ryohei Fujita, Nagoya University
Fir Room	**Assorted Topics: Thermal Performance Factor Evaluation of Lattice Structures With and Without Integrated Fins** Orkun Dogu, Aselsan

Conference Schedule

Time/Rooms	Thursday, March 12 Sessions - Pt. 2 of 2
10:00 AM - 10:20 AM	**BREAK**
10:20 AM - 12:00 PM **Oak & Fir Room**	**Dr. Robert Moffat & Dr. Clemens Lasance Memoriam** See pg 21 - 23 to learn more about Robert Moffat & Clemens Lasance "Thermal Measurements in Single and Two-Phase Cooling Systems for AI-Factories: In Honor of Prof. Robert J. Moffat," Alfonso Ortega, James R. Birle Endowed Chair Professor, Villanova University "Measurement-Driven Thermal Metrology and Two-Phase Cooling Mechanisms in High-Power Electronics," Damena Agonafer, Associate Professor and Clark Faculty Fellow, University of Maryland "Development of an Energy Efficient (and High-Performance) Capillary-based Two-Phase Cooling System for Data Centers," Mehdi Asheghi, Adjunct Professor, Mechanical Engineering Department, Stanford University "Image-Based Metrology: A Pathway to Digital Twins for Pool Boiling Regime Diagnostics," Srikanth Rangarajan, Assistant Professor, School of System Science and Industrial Engineering, Binghamton University
12:00 PM - 1:30 PM **Pine & Cedar**	**LUNCH | Best Paper & Best Poster | Hall of Fame Award** Navid Kazem, General Program Chair, Arieca See pg 23 for Hall of Fame Award Details

In Memoriam Technical Session

Honoring Dr. Robert J. Moffat & Dr.Clemens Lasance

Thursday, March 12 | 10:20 AM – 12:00 PM
Session Chair: Alfonso Ortega, Villanova University

"Thermal Measurements in Single and Two-Phase Cooling Systems for AI-Factories: In Honor of Prof. Robert J. Moffat," Alfonso Ortega, James R. Birle Endowed Chair Professor, Villanova University

"Measurement-Driven Thermal Metrology and Two-Phase Cooling Mechanisms in High-Power Electronics," Damena Agonafer, Associate Professor and Clark Faculty Fellow, University of Maryland

"Development of an Energy Efficient (and High-Performance) Capillary-based Two-Phase Cooling System for Data Centers," Mehdi Asheghi, Adjunct Professor, Mechanical Engineering Department, Stanford University

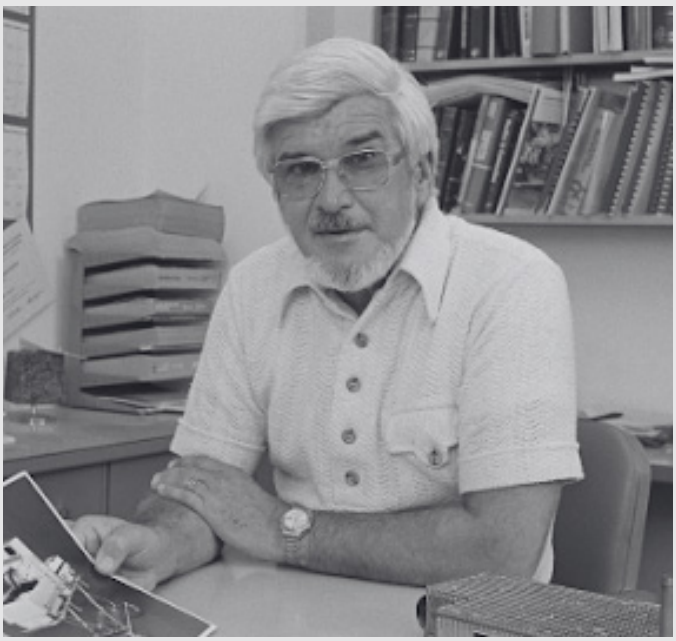
"Image-Based Metrology: A Pathway to Digital Twins for Pool Boiling Regime Diagnostics," Srikanth Rangarajan, Assistant Professor, School of System Science and Industrial Engineering, Binghamton University

Dr. Robert J. Moffat (1927–2024)

Professor Emeritus of Mechanical Engineering, Stanford University

Founding Contributor to SEMI-THERM | ASME Medalist | Mentor to Generations

Dr. Robert J. Moffat was a pioneering leader in experimental heat transfer and thermal systems whose work shaped modern measurement science and electronics cooling. Born in 1927, his career spanned more than five decades, influencing how heat transfer is measured, modeled, and taught.



After earning his Ph.D. from Stanford University, he joined the Mechanical Engineering faculty, where he spent over 40 years advancing both research and education. Known for his rigorous yet student-centered teaching, he instilled strong fundamentals in thermodynamics and fluid mechanics along with a commitment to intellectual integrity.

Continued on next page

In Memoriam Technical Session

Dr. Robert J. Moffat (1927–2024)

Continued

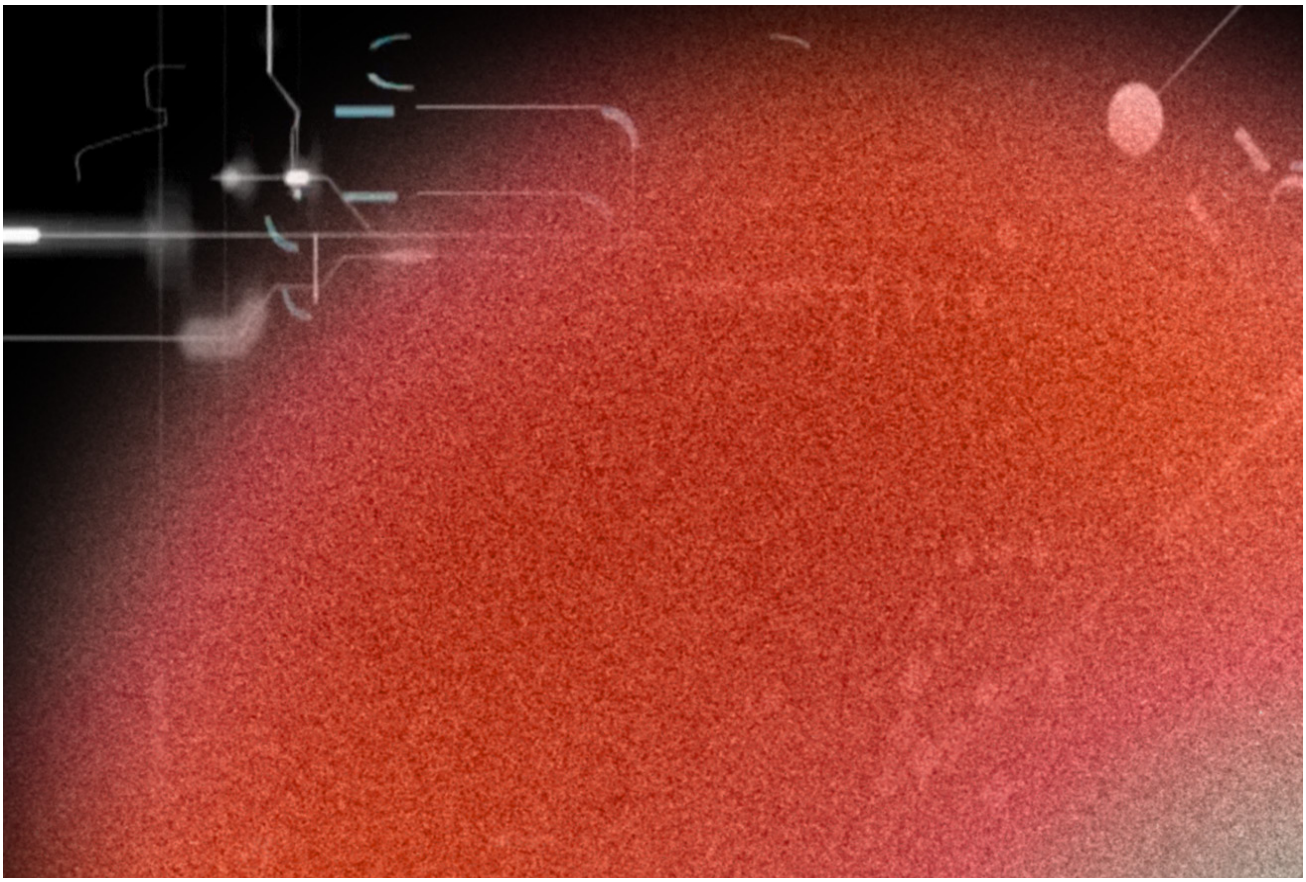
Dr. Moffat's technical legacy centers on uncertainty analysis in experimental measurements and convective heat transfer in complex systems, particularly air-cooled electronics. His methods for quantifying measurement uncertainty and modeling electronics cooling as heat exchangers established enduring best practices across the field.

A founding contributor to SEMI-THERM, his short courses became formative experiences for generations of engineers. His ability to translate complex theory into practical engineering insight left a lasting mark on the community.

His honors included the ASME Melville Medal, the Holley Medal, induction into the SEMI-THERM Hall of Fame, and fellowship in both ASME and IEEE. Beyond academia, he applied his expertise to humanitarian engineering, including the development of a portable neonatal incubator credited with saving thousands of lives.

Dr. Moffat passed away on May 10, 2024, at age 96. His legacy endures through the engineers he mentored and the standards of excellence he established in thermal science.

At SEMI-THERM 42, we honor not just the engineer, but the teacher, mentor, and friend whose influence continues to guide the field.



The SEMI-THERM Educational Foundation
Thermal Hall of Fame 2026 Presented Thursday, March 12

Dr. Clemens J. M. Lasance (1944–2025)
Principal Scientist Emeritus, Philips Research

In recognition of
Significant Contributions to the Field of Electronics Thermal Management

Dr. Clemens J. M. Lasance was a globally respected figure in the thermal management of electronic systems, best known for his groundbreaking work on compact thermal modeling and his unwavering commitment to scientific clarity and practical relevance. Over a four-decade career—most of it spent at Philips Research in Eindhoven—Clemens helped shape the theory and application of electronics cooling across the globe.

After joining **Philips Research Laboratories** in the early 1970s, Clemens built a career at the intersection of innovation and rigor. He served as **Principal Scientist,** leading initiatives that bridged theoretical modeling with real-world application—particularly in developing **boundary-condition-independent compact models**. These models, which allowed for accurate thermal prediction without dependence on specific boundary conditions, became industry standards for thermal design and simulation.

He was a central technical leader in several multi-year European collaborative projects, including **PROFIT** and **DELIGHT**, which brought together industry, academia, and government labs. These efforts resulted in dozens of technical papers and elevated the maturity of electronics cooling in fields ranging from automotive to lighting to telecommunications.

Clemens was also an exceptional communicator. As **Editor-in-Chief of Electronics Cooling Magazine** from its founding in 1995, he curated and contributed content that pushed the field forward—always advocating for accuracy, reproducibility, and relevance. His writing style was incisive, practical, and direct—just like his approach to engineering.

His influence at **SEMI-THERM** was equally profound. He was a regular speaker, short course instructor, and served as **General Chair** of SEMI-THERM 2003. He also played a major role in the THERMINIC conference series, where he shaped technical direction and mentored a generation of European thermal engineers.

Dr. Lasance received multiple honors for his work, including:

The **SEMI-THERM Significant Contributor Award (2001)**
The **Harvey Rosten Award for Excellence in Thermal Analysis (2006)**
Two **SEMI-THERM Best Paper Awards** (1995 and 2009)

These accolades reflect both the depth of his scientific contributions and the respect he earned from the global thermal engineering community.

Clemens retired from Philips in 2009 but remained an active voice in the field, contributing articles, mentoring young engineers, and participating in technical forums up to his final years. **He passed away in June 2025,** leaving behind a legacy of precision, intellectual honesty, and passion for advancing the discipline.

At SEMI-THERM 42, we honor Dr. Lasance not only for what he contributed to our field, but for how he did it—with clarity, conviction, and a deep respect for the integrity of engineering work. His impact will continue to be felt wherever serious thermal modeling is done.

Keynote Speaker

Sagi Mathai

Tuesday 9:20 AM - 10 AM

To scale datacenters within racks (scale-up) and across racks (scale-out), the challenge lies in balancing three essential needs: compute, storage, and data movement—all within the practical limits of size, power, cooling, sustainability, and cost. Copper interconnects, once the backbone of data transmission, are increasingly constrained by size and weight, electrical loss, and heat generation.

Photonic interconnects provide a powerful alternative by transmitting data with photons instead of electrons. Thin, lightweight, low-loss optical fibers enable longer links, higher bandwidth density, lower latency, and reduced thermal overhead compared to copper. These advantages increase the available headroom for scaling computing performance, which is vital for both scientific computing and artificial intelligence workloads.

This talk will examine the integration of photonic technologies into the datacenter and the emerging era of co-packaged optics, where photonics and electronics are tightly coupled. Emphasis will be placed on the temperature sensitivity of photonic components and the resulting need for thermally aware co-design at the device, package, and system level.

This talk will present challenges, approaches and results for two phase flow boiling in a near term innovative cold plate implementation as well as in a farther future 3D chip stack embedded cooling configuration. The results demonstrate capability to effectively cool conventional 2D/2.5D systems at a much lower, more sustainable cooling power cost relative to air cooling and the capability to build and effectively cool high power 3D chip stacks while mitigating the risks associated with single phase water.

Sagi Mathai, Ph.D. is a Principal Research Scientist in the Large Scale Integrated Photonics Group at HPE Labs and a Senior Member of IEEE and Optica. He earned his Ph.D. in Electrical Engineering from UCLA, where he developed high-speed III-V optoelectronic devices for microwave photonic links. His current research focuses on silicon photonics, optical transceiver and link architecture, co-packaging, and emerging optical materials for datacenter networking and high performance computing systems. Dr. Mathai has authored more than 65 technical publications, contributed three book chapters, and holds 96 U.S. patents.

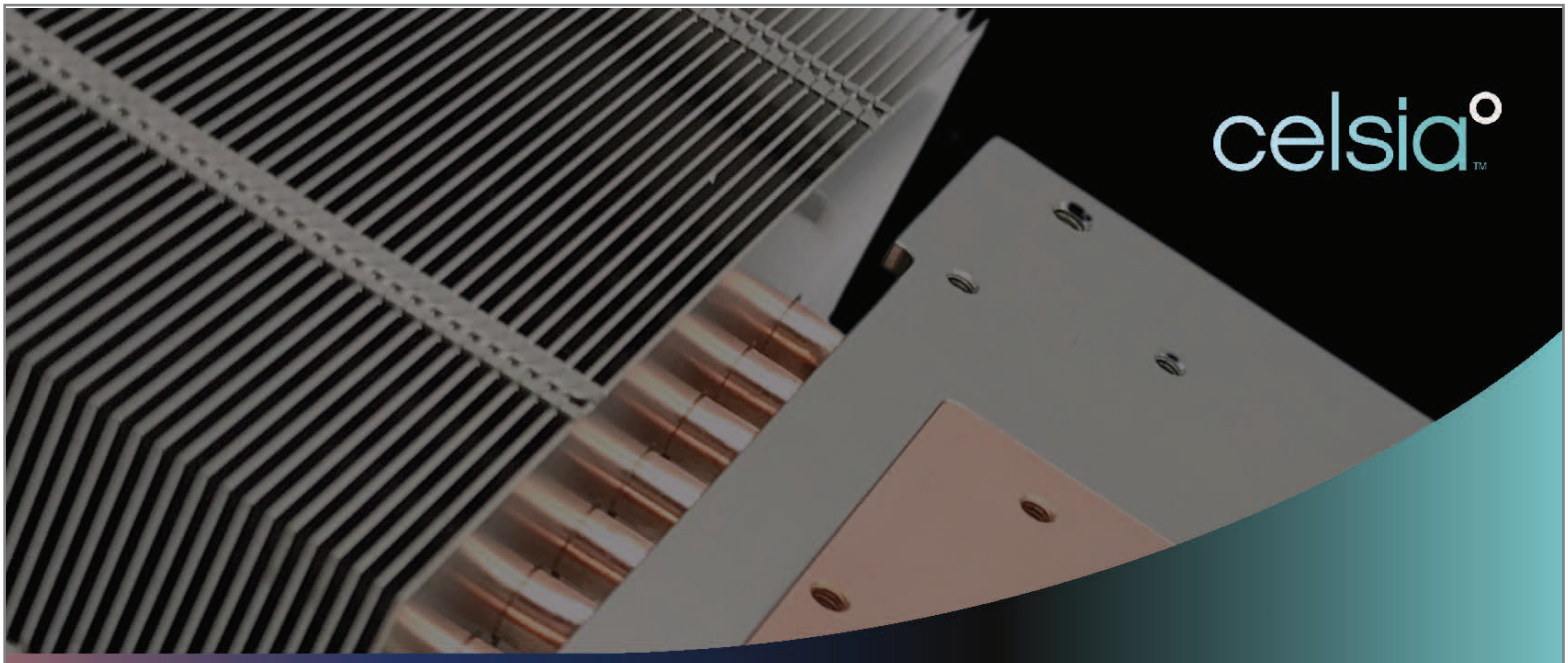
Guest Speaker

Bjorn Vermeersch, imec

Tuesday's Lunch, March 10

Procedural Artworks from Heat Equations and Japanese Embroidery

This presentation welcomes you on a guided sightseeing tour to the literal beauty hidden inside thermal simulations. Improbably combining Hitomezashi stitchery with time-periodic heat equations, a parametrised workflow turns input photographs into intricately coloured polygonal tiles whose aesthetic appearance can be fine-tuned by the thermal penetration depth and relative phase of the heat power. A variety of tile designs and examples of tessellated mosaics will be showcased.



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2026 THERMI Award

Presented Wednesday, March 11

Guy Wagner

Director of Engineering
Electronic Cooling Solutions, Inc.

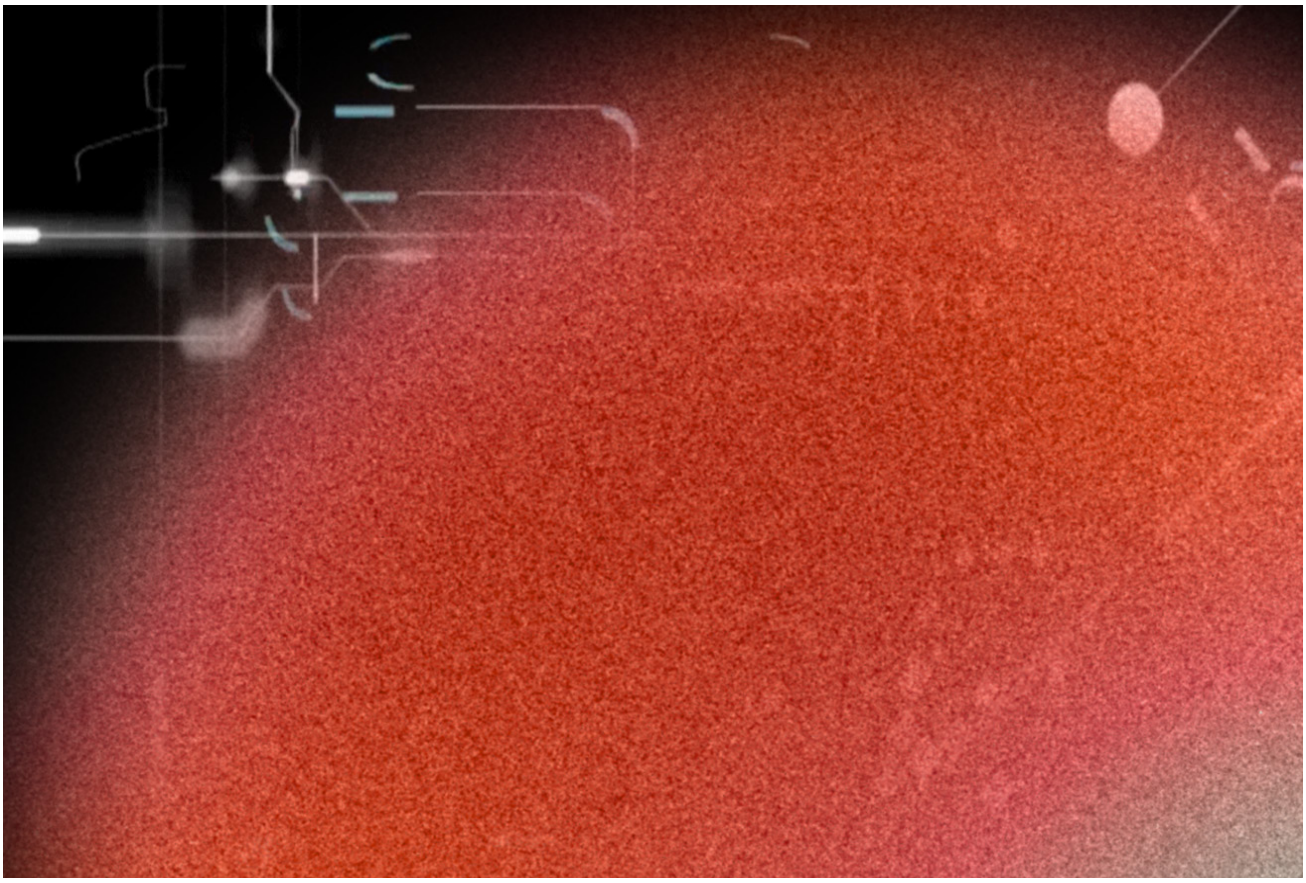
In recognition of Significant
Contributions to the Field of
Thermal Analysis of Electronic Equipment

Guy Wagner has over 45 years of experience in the electronics industry.

His experience includes cooling of a wide variety of electronics using natural, forced air and liquids for telecom, avionics, medical devices, IC packaging, disk drive and computer systems. He has authored over 40 papers and presentations at international conferences and holds 35 patents.

Before joining Electronic Cooling Solutions as Director of Engineering, he held positions as a Director of Engineering at Cornice Inc., Chief Scientist for the HP/Agilent Technologies and as a Member of Technical Staff at AT&T Bell Laboratories.

Guy's degrees in Mechanical Engineering are from Iowa State University.



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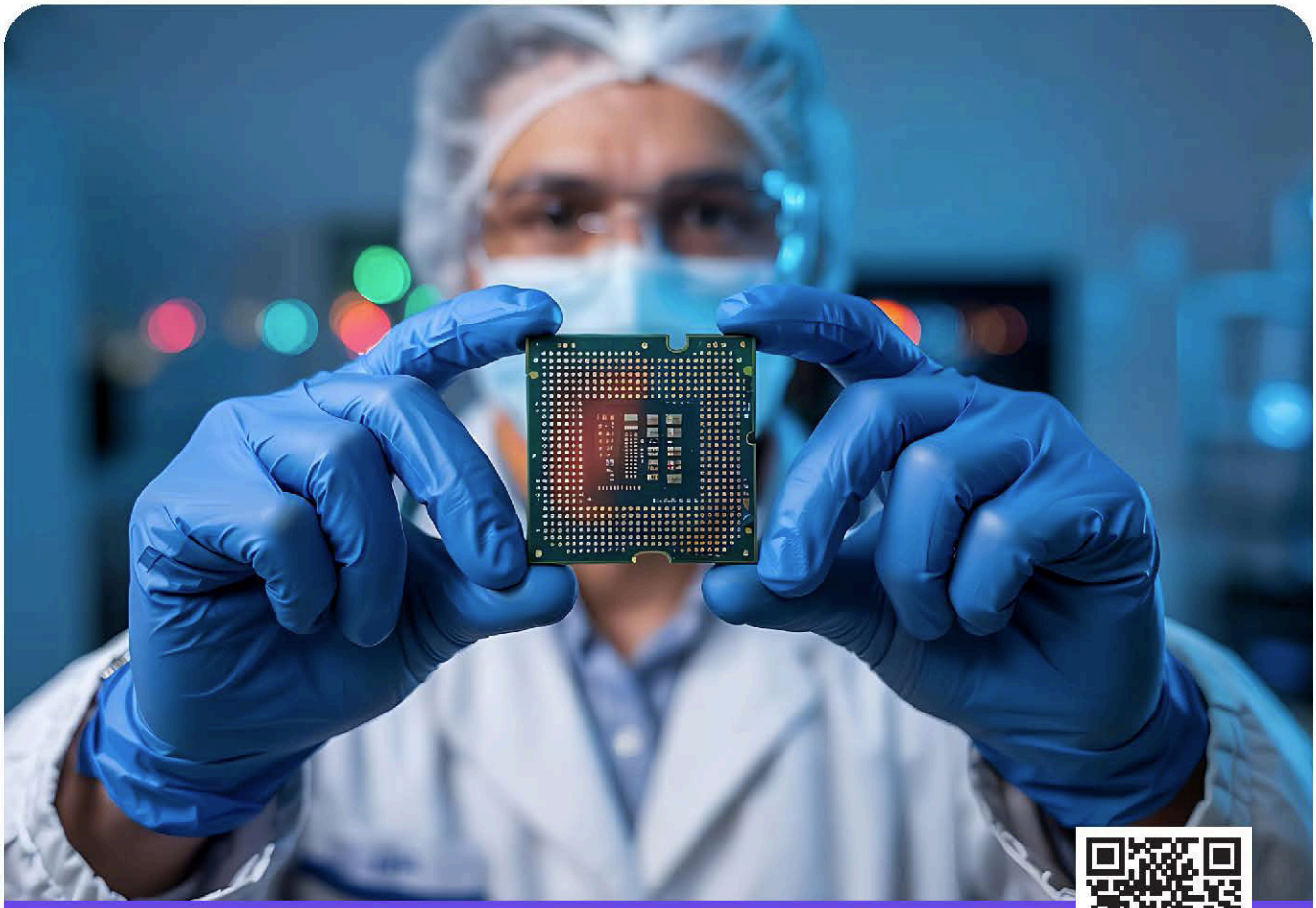

Designed for peak performance - discover what Solstice PTM9750 can do for Cloud Computing, Electric Vehicles and Consumer Electronics applications.

2026 Harvey Rosten Award Presented Tuesday, March 10

The Award recognizes outstanding work in thermal analysis or modeling of electronic equipment and components, including validation experiments. Established by Harvey Rosten's family and friends, it honors his contributions to the field. The annual award includes a plaque and a $1,000 cash prize, encouraging innovation and excellence. A committee of experts selects the recipient based on criteria such as advancing thermal analysis, practical application to electronics design, insight into thermal behavior, innovation, and a pragmatic approach.

"Comparison of 3D Manifold Architectures for Cooling of Internal Heatsinks using External Airflow"

[1] School of Engineering, Trinity College Dublin, Dublin, Ireland
[2] Toyota Research Institute of North America, Ann Arbor, Michigan, USA

Gearóid Farrell[1] is a Ph.D. student in the Department of Mechanical and Manufacturing Engineering at Trinity College Dublin. He received his BAI and MAI in Mechanical Engineering from Trinity College Dublin in 2022 and was awarded a Trinity Research Doctorate Award in 2024. His research interests include heat sink optimization, aerodynamic modelling, thermo-fluid experimentation, and flow control. In 2025, he received the Professor Avram Bar-Cohen Award for Best Paper in the System-Level Thermal Management track at ITherm, as well as the Tom Brazil Award from CONNECT for early-career research achievements.

Rajesh Nimmagadda[1] obtained PhD in Mechanical Engineering from Indian Institute of Technology Hyderabad, specializing in computational fluid dynamics (CFD) and heat transfer. His research combines experimental and numerical studies on nanofluid heat transfer in micro-channels towards electronics cooling. He has worked as a Postdoctoral Fellow at Tel Aviv University, Israel on projects funded by the Israeli Nuclear Research Authority and the Israeli Science Foundation. Rajesh has published over 20 research articles with more than 700 citations and an h-index above 13. Currently a Postdoctoral Researcher at CONNECT, he led CFD-based projects with Huawei Sweden and Toyota Research Institute of North America, developed optimized heatsinks for electronics cooling in sustainable aviation. Currently, he is working on Research Ireland's National Challenge – 2050 Challenge funded project on "Battery Modelling and Thermal Management for Electric Vehicles". His expertise spans CFD, thermal management, and advanced cooling technologies.

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2026 Harvey Rosten Award

Presented Tuesday, March 10

"Comparison of 3D Manifold Architectures for Cooling of Internal Heatsinks using External Airflow"

[1] School of Engineering, Trinity College Dublin, Dublin, Ireland
[2] Toyota Research Institute of North America, Ann Arbor, Michigan, USA

Shailesh N. Joshi[2] is a Senior Manager in the Electronics Research Department at the Toyota Research Institute of North America (TRINA). He holds M.S. and Ph.D. degrees in Mechanical Engineering. Dr. Joshi develops advanced power module architecture utilizing wide-bandgap semiconductor devices for automotive power electronics. His expertise encompasses advanced packaging and thermal management technologies, including cooling solutions that span from air-based systems to compact, high heat flux two-phase designs, as well as high-performance bonding techniques. With over 170 issued patents and more than 85 publications in peer-reviewed journals and conference proceedings, his work has earned multiple best paper awards at international conferences and a best journal paper award. His research on compact two-phase coolers was also a finalist for the prestigious R\&D 100 Award.

Danny J. Lohan[2] received his BS degree in General Engineering and his MS and PhD in Systems and Entrepreneurial Engineering from the University of Illinois at Urbana-Champaign. In his former role he was a Senior Scientist in the Electronics Research Department at the Toyota Research Institute of North America. His research interests include numerical optimization methods for engineering design, and he has applied this interest to a variety of vehicle technologies such as thermal management systems, power electronics packaging, and human-machine interfaces. He currently holds 33 issued patents, and his research is featured in over 39 peer-reviewed scientific publications.Ireland's National Challenge – 2050 Challenge funded project on "Battery Modelling and Thermal Management for Electric Vehicles". His expertise spans CFD, thermal management, and advanced cooling technologies.

Tim Persoons[1] is Associate Professor in the Department of Mechanical and Manufacturing Engineering at Trinity College Dublin. He is a visiting Faculty member in the NSF Cooling Technologies Research Center at Purdue University. He received his Doctorate in Engineering from KU Leuven in 2006. Dr. Persoons' research activities include multi-scale convective heat transfer in electronics thermal management using unsteady flows, active flow control for sustainable energy devices, and developing experimental thermo-fluid measurement techniques. He has authored over 150 refereed journal and conference publications, serves in editorial roles for IEEE Trans Compon Packag Manuf Technol, Exp Therm Fluid Sci, ITherm, Therminic, Eurotherm, and was co-recipient of the 2013 Hartnett-Irvine Award and the 2020 Harvey Rosten Award.

Continued on next page

2026 Harvey Rosten Award

Presented Tuesday, March 10

"Comparison of 3D Manifold Architectures for Cooling of Internal Heatsinks using External Airflow"

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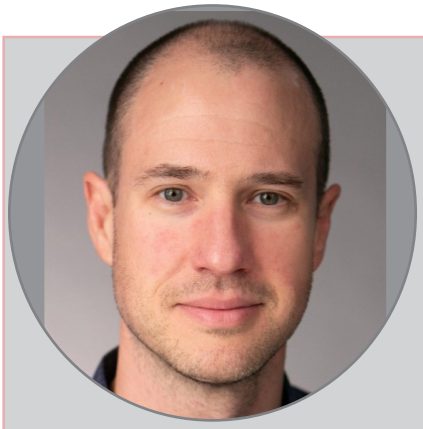

Ercan (Eric) M. Dede[2] received his BS degree and PhD in mechanical engineering from the University of Michigan and an MS degree in mechanical engineering from Stanford University. Currently, he is the Director of the Electronics Research Department at the Toyota Research Institute of North America. He is a Fellow of the American Society of Mechanical Engineers (ASME) and a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE). His team focuses on vehicle systems involving advanced sensors, human-machine interfaces, power semiconductors, electronics and photonics packaging, and thermal management technology. He has 240+ issued patents and has published more than 140 articles in archival journals and conference proceedings on topics related to advanced electronics systems including the design and optimization of thermal-fluid, mechanical, and electromagnetic devices. He is an author of a book entitled "Multiphysics Simulation: Electromechanical System Applications and Optimization." His team has received two R\&D 100 Awards for the development of technologies related to next-generation electronics for electrified vehicles. He currently serves as an Associate Editor for the ASME Open Journal of Engineering and a Guest Editor for IEEE Transactions on Components, Packaging and Manufacturing Technology.

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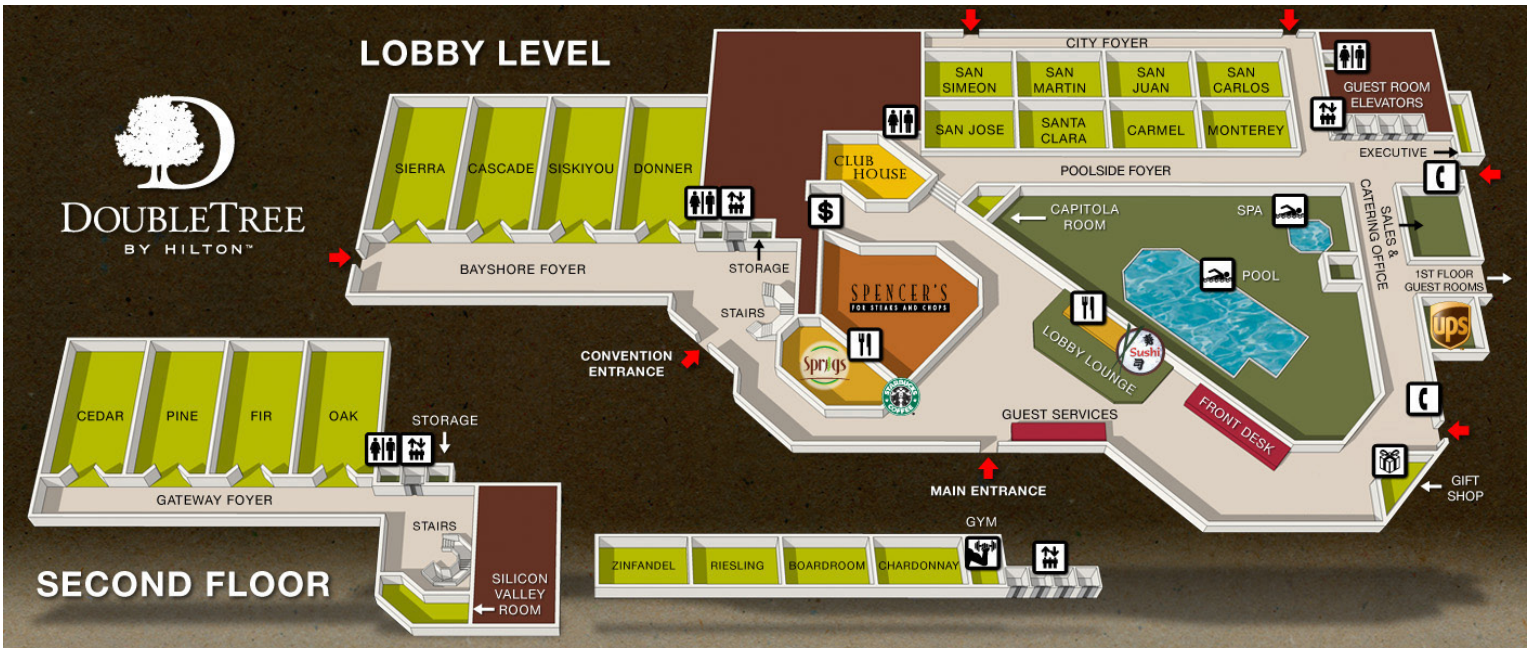

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Thank you for being part of **SEMI-THERM**. We look forward to seeing you next year!