

74th ECTC 2024

Special Sessions

Program Chair
Michael Mayer, University of Waterloo

74th ECTC Special/Panel/Plenary Sessions, Keynote, Seminar



	Special Session Topics	Chair/co-chair/moderator	Date	Time
1	Exploring the Impact of Industry-Government Co-Investments for the Advanced Electronics Sector in North America, Asia and Europe	Przemyslaw Gromala (Bosch); Erik Jung (Fraunhofer IZM)	Tuesday 05/28/2024	8:30 a.m. – 10:00 a.m.
2	Challenges and Opportunities in Advancing Metrology for Next-Generation Microelectronics	Ran Tao (NIST); Benson Chan (Binghamton University)	Tuesday 05/28/2024	10:30 a.m. – 12:00 p.m.
3	Efficient and Innovative Thermal Management for Power Hungry AI/ML Applications: Challenges and Opportunities	Zhi Yang (Groq); Sevket Yuruker (Tesla)	Tuesday 05/28/2024	1:30 p.m. – 3:00 p.m.
4	RF Packaging for Communication and Sensing Applications above 100 GHz – Technologies, Design Challenges and Emerging Solutions	Maciej Wojnowski (Infineon Technologies AG), Ivan Ndip (Fraunhofer IZM)	Tuesday 05/28/2024	3:30 p.m. – 5:00 p.m.
5	Young Professionals Network Panel	Aakrati Jain (IBM), Jain (IBM), Rui Chen (Eastern Michigan University), ZhangmingZhou (Auburn University)	Tuesday 05/28/2024	7:00 p.m. – 7:45 p.m.
6	IEEE EPS Seminar: Challenges of Chiplets on Large Substrates	Takashi Hisada (Rapidus); Yasumitsu Orii (Rapidus); Rich Graff (Marvell)	Tuesday 05/28/2024	7:45 p.m. – 9:15 p.m.
7	ECTC Keynote by Keren Bergman (Columbia University): Petascale photonic chip connectivity for energy efficient AI computing	Karlheinz Bock (TU Dresden; ECTC General Chair)	Wednesday 05/29/2024	8:00 a.m. – 9:15 a.m.
8	ECTC/iTherm Diversity Panel and Reception: Best Practices to Attract, Hire and Retain a Diverse Workforce	Vidya Jayaram (Intel) for ECTC, Christina Amon (University of Toronto) for iTherm	Wednesday 05/29/2024	6:30 p.m. – 7:30 p.m.
9	ECTC Plenary: The Future of Semiconductor Industry. Emerging Start-ups and Technologies for Advanced Packaging	Rozalia Beica (Averatek), Farhang Yazdani (Broadpak)	Thursday 05/30/2024	8:00 a.m. – 9:15 a.m.
10	IEEE EPS President's Panel: Challenges in Education and Workforce Development in the New Chips Economy	Pat Thompson (TI, IEEE EPS President), K. Pearsall (Boss Precision Inc.), Jeff Suhling (Auburn University), Mark Poliks (Binghamton University)	Friday 05/31/2024	8:00 a.m. – 9:15 a.m.



Chair

Przemyslaw Gromala

Robert Bosch GmbH



Chair

Erik Jung

Fraunhofer IZM



Speaker

Elisabeth Steimetz

EPoSS, Europe



Speaker

Rao Tummala

Advisor to the Gov. of India



Speaker

Subramanian S. Iyer

*National Advanced
Packaging*



Speaker

Gordon Harling

*CMC Microsystems,
Canada*



Speaker

Kwang-Seong Choi

*Electronics and
Telecommunications
Research Institute,
Korea*

Exploring the Impact of Industry-Government Co-Investments for the Advanced Electronics Sector in North America, Asia and Europe

Essential to the global economy and innovation landscape, the semiconductor and microelectronics packaging industries are seeing government led investment programs. The introduction of the CHIPS and Science Act (Creating Helpful Incentives to Produce Semiconductors for America) in the United States has been inspiring similar programs, e.g. in Europe the European Chips Act.

Speakers in this special session discuss programs and co-investments for the United States, Europe, India and East Asia, including job creation, supply chain resilience, and enhanced technological innovation. We will examine the prospects of global collaborations and partnerships between national semiconductor and microelectronic packaging centers and industry leaders. The session will also discuss mechanisms for knowledge exchange, joint research initiatives, and mutually beneficial outcomes.



Chair
Ran Tao
NIST



Chair
Benson Chan
Binghamton University



Moderator
Jan Vardaman
TechSearch International



Speaker/Panelist
Paul Hale
NIST



Speaker/Panelist
Gaurang Choksi
Intel Corporation



Speaker/Panelist
Zhihua Zou
TSMC



Speaker/Panelist
CP Hung
ASE



Speaker/Panelist
Chet Lenox
KLA Corporation

Challenges and Opportunities in Advancing Metrology for Next-Generation Microelectronics

Metrology plays a pivotal role in semiconductor research and manufacturing and is critical to the success of this industry. Advancements in measurement science, material characterization, instrumentation, testing, and manufacturing capabilities are critically needed to drive product innovation and ensure quality, yield, and manufacturing efficiency. During the panel discussion, experts will share their insights on the metrology challenges and opportunities that today's semiconductor industry is facing across every segment of the supply chain, with a focus on advanced semiconductor packaging for next-generation microelectronics (e.g., heterogeneous integration, wafer level packaging, hybrid bonding, etc.).



Chair
Zhi Yang
Groq



Chair
Sevket Yuruker
Tesla

Efficient and Innovative Thermal Management for Power Hungry AI/ ML Applications: Challenges and Opportunities

The rapid advancement of artificial intelligence (AI) and machine learning (ML) technologies has led to the proliferation of high-power AI/ML applications in various domains, such as autonomous vehicles, high performance computing and natural language processing. However, this growth is accompanied by escalating thermal challenges that can critically impact the performance, reliability, and lifespan of entire systems. The non-uniform distribution of heat sources on AI/ML hardware further complicates cooling strategies. Moreover, the reliance on traditional thermal management techniques may prove inadequate in addressing emergent challenges.

To address these challenges, several industry and academia experts are discussing the current status and opportunities for innovative thermal management developments/ methodologies in this special session.



Speaker/Panelist
Ki Wook Jung
Samsung



Speaker/Panelist
Igor Arsovski
Groq



Speaker/Panelist
Mudasir Ahmad
Google



Speaker/Panelist
Tiwei Wei
Purdue University



Speaker/Panelist
Christopher Ortiz
Ansys



Chair

Maciej Wojnowski

Infineon Technologies AG



Chair

Ivan Ndip

Fraunhofer IZM/Brandenburg
University of Technology

RF Packaging for Communication and Sensing Applications above 100 GHz – Technologies, Design Challenges and Emerging Solutions

In this session, experts from industry and academia will present the latest developments in RF packaging for communication and radar sensing applications above 100 GHz. The panel will begin with a presentation of emerging applications, resulting challenges and opportunities for RF packaging. The experts will share the latest developments in RF packaging materials and technologies. Emerging RF system integration platforms will be presented, stressing the importance of material characterization and modeling as well as co-design and co-simulation techniques. The panel will conclude with examples of recent R&D results for novel D-band waveguide interfaces in packages for 6G data links over plastic microwave fiber (PMF), antennas-in-package (AiP) and phased array front-end AiP modules.



Speaker/Panelist

Madhavan

Swaminathan

Penn State U.



Speaker/Panelist

Uwe Maass

Fraunhofer IZM



Speaker/Panelist

Martin Letz

Schott AG



Speaker/Panelist

Swaminathan

Sankaran

Texas Instruments

2024 Young Professionals Meetup

Join us for an invaluable opportunity to connect with industry leaders and fellow emerging talents! Tailored specifically for young professionals, including current graduate students, this event is crafted with your needs in mind. Engage in dynamic interactions with senior EPS members and professionals through a series of active and engaging activities. Seize the chance to delve deeper into packaging-related topics, pose career questions, and connect with industry professionals for a valuable learning experience.



Co-Chair
Aakrati Jain
IBM



Co-Chair
Rui Chen
*Eastern
Michigan
University*



Co-Chair
**Zhangming
Zhou**
*Auburn
University*



Chair

Takashi Hisada
 Rapidus Corporation


Chair

Yasumitsu Oorii
 Rapidus Corporation


Moderator

Rich Graff
 Marvell

 Speaker/Panelist
Gang Duan
 Intel

 Speaker/Panelist
Kinya Ichikawa
 TSMC

 Speaker/Panelist
Kenneth Larsen
 Synopsys

 Speaker/Panelist
Masahisa Ose
 Resonac

 Speaker/Panelist
Harish Penmethsa
 AMAT

 Speaker/Panelist
Yu-Po Wang
 SPIL

 Speaker/Panelist
Rozalia Beica
 LQDX

Substrate-Scaling Challenges in Chiplet Integration

Chiplet is driving performance scaling and cost efficiency of the advanced semiconductor systems. There are difficult challenges for the substrates in chiplet integration such as very large size of the substrates, fine line and space ground rule with multiple layers, mechanical stress, reliability, and complexity of design.

The EPS Seminar organized by TC6 (High-Density Substrate and Board) will discuss technical and business challenges of chiplet on large substrate. We will have 7 panelists, and each panelist will give a short talk presenting insights on technology trends, technical challenges, application requirements, recent technical updates and more covering package form factors, design tools, materials, manufacturing tools, and assembly processes for advanced chiplet integration, followed by a panel discussion.

Titles of Panelists' Talks

Glass Package Substrate (Gang Duan)

Substrate challenges for Large CoWoS package platform (Kinya Ichikawa)

Solving New Design Challenges from Chiplet to Multi-Die System (Kenneth Larsen)

Advanced Substrate Materials for Large Substrate (Masahiro Ose)

Manufacturing Tools for Assembly of Chiplets (Harish Penmethsa)

OSAT's Perspective on Chiplets (Yu-Po Wang)

Novel Technology Solutions Enabling Advanced Interconnects For Next Generation High Performance Computing (Rozalia Beica)

Petascale photonic chip connectivity for energy efficient AI computing

Keynote Speaker: Prof. Keren Bergman (Columbia University)



Abstract

High-performance data centers are increasingly bottlenecked by the energy and communications costs of interconnecting numerous compute and memory resources. Current systems face a gap of nearly two orders of magnitude between on-chip, intra-socket, communication capacities, and the capacities of links transporting data over longer distances. The per bit energy cost of data movement dominates that of data processing, as does density, throughput, and latency. Integrated silicon photonics offer the opportunity of optical connectivity that delivers high off-chip communication bandwidth densities with low power consumption. To realize these benefits deeply embedded packaging of photonics with the compute and memory is critical. This talk will cover these multi-chip packaging challenges as well as approaches for leveraging dense wavelength-division multiplexing photonic IO that can scale to realize Petabit/s chip escape bandwidths with sub-picojoule/bit energy consumption.



Chair
Cristina Amon
University of Toronto



Chair
Vidya Jayaram
Intel



Speaker
Ramona Prioleau
CHIPS



Speaker
Margaret Kindling
SEMI Foundation



Speaker
Allyson Stewart
Marvell Inc.



Speaker
Al Ortega
Villanova University



Speaker
Tina Herrera
NREL



Speaker
Ravi Mahajan
Intel Corporation

Effective Practices to Attract, Promote and Retain a Diverse Workforce

Semiconductor, electronic packaging and energy-related companies are planning to grow their workforces to meet the current and expected demands due to policy incentives and domestic investments, including the CHIPS Act. To achieve business and economic success, we will need to attract a broader group of students to the relevant fields and expand beyond the traditional pool of candidates to include women and underrepresented minorities from rural candidates to veterans and mid-career retrainees. This panel will focus on how best practices in Diversity, Equity and Inclusion have been implemented and can be used to attract students and hire, develop, promote and retain employees within organizations to meet their goals.

The panelists will introduce some of the challenges faced by women, minorities, and underrepresented groups, as well as share their organization's strategies for professional development, promotion, retention, and success. This will be followed by an interactive Q&A with the audience.

After the panel session, a social and networking reception will be held. All ECTC and ITherm attendees are invited to join in on this engaging discussion and the reception afterwards.



Chair
**Rozalia
Beica**
LQDX



Chair
**Farhang
Yazdani**
BroadPak

START-UP Speakers

- Victor Chiriac, Global Cooling Technology Group
- Mohsen Asad, Hyperlume
- Wayne Rickard, Terecircuits
- Tristan El Bouayadi, Thintronics

The Future of Semiconductor Industry. Emerging Start-ups and Material Innovations in Advanced Packaging

Styled as a start-up competition, this session looks at next generation materials and companies. It features presentations from start-up companies and reviewed by a panel of judges from the industry and investment community.

Jury Panel - Chair

- Jeffrey Perkins, Yole Group

Jury Panel - Members

- Simi Sherman, Navat Capital
- Min Zhou, CM Venture
- Blair Georgakas, Applied Ventures
- Min Zhou, CM Venture Capital
- Martijn Pierik, Kiterocket
- Hidenori Abe, Resonac
- Jason Rouse, Taiyo America, Inc.

Topics include Materials & Processes for MicroLED and System-In-Package, Thermal Management, Dielectrics & Metallization for High End IC Substrates

Awards contributed by

Yole Group
Kiterocket

Challenges in Education and Workforce Development in the New Chips Economy



Chair
Patrick Thompson
TI



Chair
Mark Poliks
Binghamton
University



Chair
Jeff Suhling
Auburn University



Chair
Kitty Pearsall
Boss Precision Inc.



Panelist
John Oakley
SRC



Panelist
Toni Mattila
Business Finland



Panelist
Robert Geer
SUNY Polytechnic
University



Panelist
Wenhui Zhu
Central South
University



Panelist
Jim Wieser
TI

The semiconductor and packaging industries are currently experiencing unparalleled growth, driven by demand in areas such as AI, transportation electrification, digital manufacturing, data centers, mobile devices, hybrid flexible electronics, virtual reality, and photonics and MEMS. This expansion has prompted substantial global investments in new fabs and packaging infrastructure, supported by government spending in North America, Europe, and Asia.

However, the parallel surge in demand for skilled labor poses a considerable challenge, with estimates indicating a threefold increase in headcount required over the next five years. The industry is seeking individuals with multidisciplinary education, ranging from technician degrees to Ph.D. degrees. The panel will explore workforce needs, industry perspectives on student preparation, global approaches to electronics packaging education, and innovative strategies to attract students to the semiconductor packaging field.