ATNS 2024

ADVANCED TECHNOLOGY FOR NATIONAL SECURITY WORKSHOP

9–11 APRIL 2024

9 April: Broad Perspectives on Microelectronics Strategies [Secret]

- Government Microelectronics Perspectives
- DoD Service Labs Perspectives and Panel Discussion
- Lincoln Laboratory Perspectives
- Defense Industrial Base Strategy and Perspectives

Keynote: Whitney Mason, Director of Microsystems Technology Office, DARPA
Keynote: Senior Intelligence Officer, Intelligence Community
Keynote: Dale Rielage, Director of OSD Red Team

10 April: Prototyping Strategies for Critical Technologies [Distro C]

- Non-DoD Government Microelectronics Programs
- Secure Edge Computing
- Electronic Warfare
- 5G/6G Technology

Keynote: Jay Lewis, Director of National Semiconductor Technology Center (NTSC) Program

11 April: Prototyping Strategies for Critical Technologies (cont.) [Distro C]

- Accelerator Architectures for AI and Other Applications
- Imager Technology
- Packaging and 3D Heterogeneous Integration Technology

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AGENDA – DAY 1

BROAD PERSPECTIVES ON MICROELECTRONICS STRATEGIES (SECRET)

TUESDAY, 9 APRIL

Keynote Session: Government Microelectronics Perspectives — *Workshop Chair:* **Mark Gouker**

0830	Keynote - What's Next in Microelectronics?	**Whitney Mason,** Director of the MTO, DARPA
0915	Keynote - Adversaries' Microelectronics Strategies	**Senior Intelligence Officer,** Intelligence Community
1000	Keynote - US Systems from an Adversary's View	**Dale Rielage,** Director, OSD Red Team
1045	*Break*	

Session 2: DoD Service Labs Perspectives and Panel Discussion — *Session Chair:* **Livia Racz**

1100	Air Force Research Laboratory	**Chris Bozada,** Sensors Directorate
1110	Army Research Laboratory	**Marc Ulrich,** DEVCOM - ARL
1120	Bridging the Valley of Death to Device Transition: SHIP Transition Strategy	**Brian Olson,** NSWC Crane
1130	Naval Research Laboratory	**Jeff Pond,** NRL
1140	DoD Service Labs Perspectives Panel Discussion	
1210	*Lunch*	

Session 3: MIT Lincoln Laboratory Perspectives — *Session Chair:* **Carrie Huguenin**

1310	Microelectronics Strategy	**Bob Atkins,** MIT LL
1340	Directed Energy: Case Study for Panelized Lasers	**Scot Shaw,** MIT LL
1405	Global Persistent ISR: Case Study for Advanced Imagers	**Bob Michniak,** MIT LL
1430	High-End Computing: Case Study for Superconducting Electronics	**Mark Gouker,** MIT LL
1450	*Break*	

Session 4: Defense Industrial Base Strategy and Perspectives — *Session Chair:* **Herman Pretorius**

1520	Lockheed Martin Perspectives	**John Halpin,** Lockheed Martin
1530	Northrop Grumman Perspectives	**Josei Chang,** Northrop Grumman
1540	BAE Systems Perspectives	**James Li,** BAE Systems
1550	Raytheon Technologies Perspectives	**Tim Hancock,** Raytheon Technologies
1600	Defense Industrial Base Strategy and Perspectives Panel Discussion	

Transition Talk to Reception

1630	Deep Space Optical Communication on Psyche Spacecraft	**Abbey Licht,** MIT LL
1650	*Workshop Reception with Passed Hors d'Oeuvres*	

AGENDA – DAY 2

PROTOTYPING STRATEGIES FOR CRITICAL TECHNOLOGIES (DISTRO C)

WEDNESDAY, 10 APRIL

Keynote Session: Non-DoD Government Microelectronics Programs — *Session Chair:* **Melissa Smith**

0900 Keynote - Keynote Address ..... **Jay Lewis,** Director, National Semiconductor Technology Center (NSTC) Program

0945 *Break*

Session 2: Secure Edge Computing — *Session Chair:* **Michelle Lloyd**

1000 Foundationally Secure, Integrated Hardware/Software Stack for Secure Edge Computing ..... **Hamed Okhravi,** MIT LL

1020 Microelectronics Commons Perspectives and Strategies for Driving Technology Transition ..... **Wayne Churaman,** DEVCOM Army

1040 Towards Inherently Secure and Robust Computation ..... **Howie Shrobe,** DARPA

1100 TBD ..... **Shahin Tajik,** WPI

1120 Leveraging Hardware Primitives to Enforce Zero-Trust in Mission Systems ..... **Nathan Burrow,** MIT LL

1140 *Lunch and Tours*

Session 3: Electronic Warfare — *Session Chair:* **Beijia Zhang**

1300 Technology Development for Future EW Systems ..... **Will Moulder,** MIT LL

1320 The Future of Wide and Ultra-Wide Bandgap Materials and Electronic Devices ..... **Tomas Palacios,** MIT

1340 Government Perspective ..... **TBD,** TBD

1400 Scalable On-Array Processing ..... **Jon Doane,** MIT LL

1420 Integrated Microwave Photonics for Electronic Warfare ..... **Sivasubramaniam Yegnanarayanan,** MIT LL

1440 *Break*

Session 4: 5G/6G Technology — *Session Chair:* **Chris Galbraith**

1500 Information Processing as a Guiding Principle in Next-Generation Standards ..... **Muriel Medard,** MIT

1520 Microelectronics Commons 5G/6G Technology Area ..... **Eric Makara,** NRL

1540 The Future Battlespace with 5G/6G Technology ..... **Steven Naboicheck,** Lockheed Martin

1600 5G/6G US DoD Use Cases and Emerging Requirements ..... **Tarun Soni,** Northrop Grumman

1620 Agile 5G/6G Network Solution for Commercial and DoD Applications ..... **Tony Masters,** JMA Wireless

1640 *Workshop Reception with Passed Hors d'Oeuvres*

AGENDA – DAY 3

PROTOTYPING STRATEGIES FOR CRITICAL TECHNOLOGIES CONT. (DISTRO C)

THURSDAY, 11 APRIL

Session 1: Accelerator Architectures for AI and Other Applications — *Session Chair:* **Erin Tomlinson**

0830 AI and ML Accelerator Survey and Trends ..... **Albert Reuther,** MIT LL

0850 NeuroPipe and Beyond: Challenges Facing Neuromorphic Devices and Architectures ..... **Hans Cho,** NRL

0910 Adopting AI Inference Accelerators for DoD Applications ..... **Karen Gettings,** MIT LL

0930 Emerging AI Accelerator Based on Memristor Technology ..... **Qiangfei Xia,** UMass Amherst

0950 Adaptive Learning and Distributed AI at the Edge ..... **David Zhang,** SRI International

1010 *Break*

Session 2: Imager Technology — *Session Chair:* **Kevan Donolon**

1030 The Evolving Landscape of Imagers for National Security ..... **Dan Schuette,** MIT LL

1050 University Perspective ..... **TBD,** TBD

1110 Leveraging Microelectronics Advancements for Next-Generation Digital Imagers ..... **Matt Stamplis,** MIT LL

1130 Superconducting Nanowire Single Photon Detectors for Time-Resolved Imaging ..... **Matthew Shaw,** JPL

1150 *Lunch*

Session 3: Packaging and 3D Heterogeneous Integration Technology — *Session Chair:* **Ryan Keech**

1250 Needs and Opportunities in 3D Heterogeneous Integration and Beyond ..... **Livia Racz,** MIT LL

1310 Reshore Ecosystem for Secure Heterogeneous Advanced Packaged Electronics (RESHAPE) ..... **Matt Walsh,** Navy Crane

1330 The Emerging Benefit of AI toward Electronic Design in Advanced Packaging ..... **Taylor Hogan,** Cadence

1350 Advanced Packaging at Lincoln Laboratory ..... **Rabindra Das,** MIT LL

1410 *Conference Adjourns*