



MIST CENTER

Multi-functional Integrated System Technology



MIST Center for MIST Computing

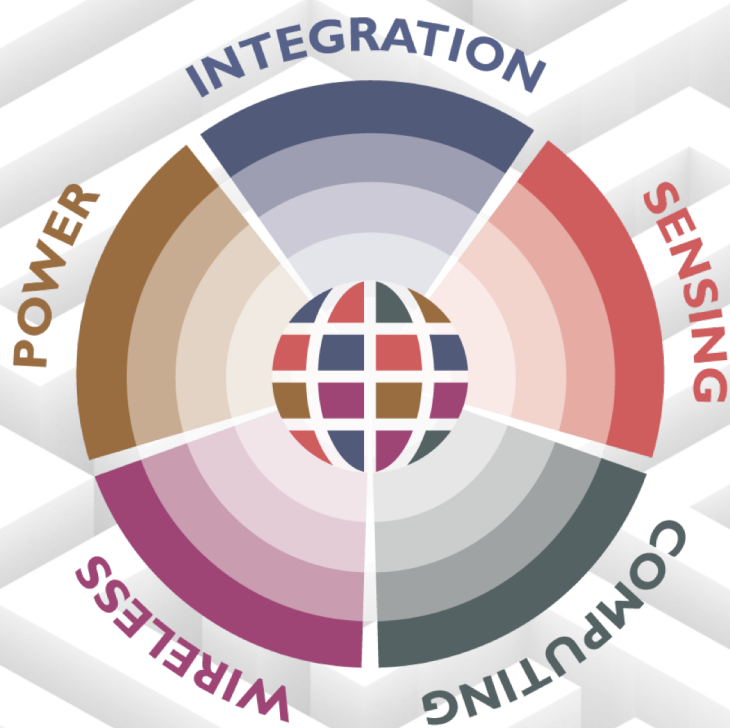
Aug. 8, 2018

Toshi Nishida
MIST Center Director

David Arnold
Deputy Director

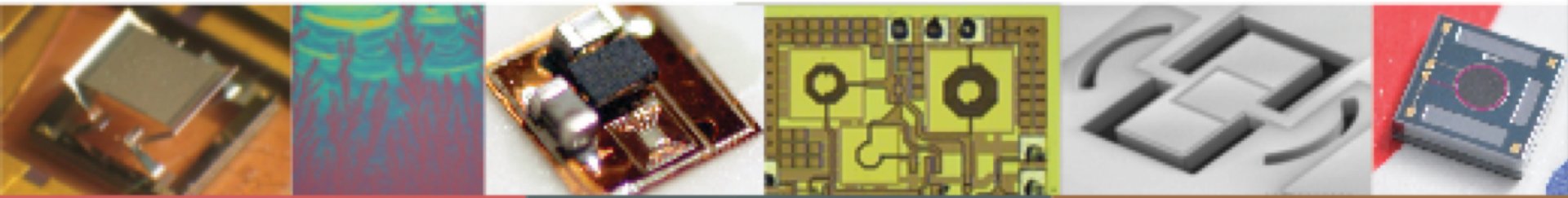
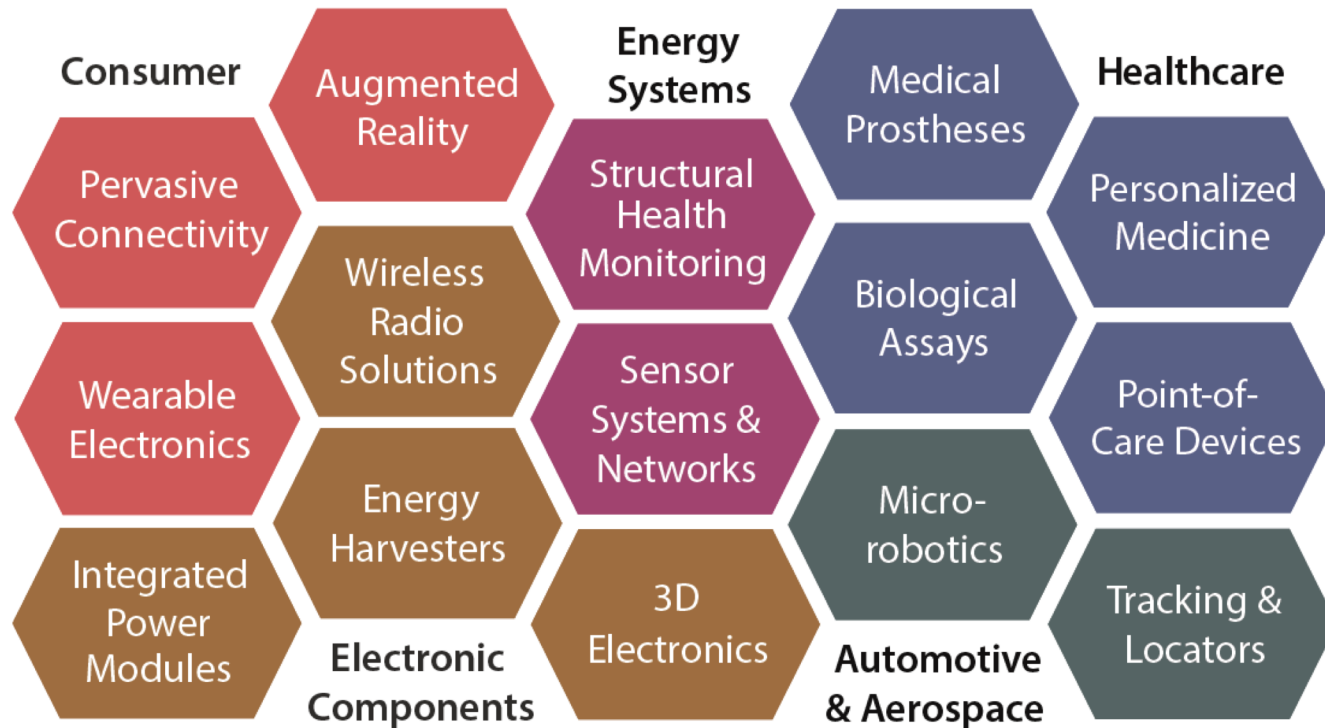
Shelby Powell
Center Coordinator

We are an early-stage research sandbox for developing next-generation smart systems in the Internet of Things era.



Smart Systems are Changing the World

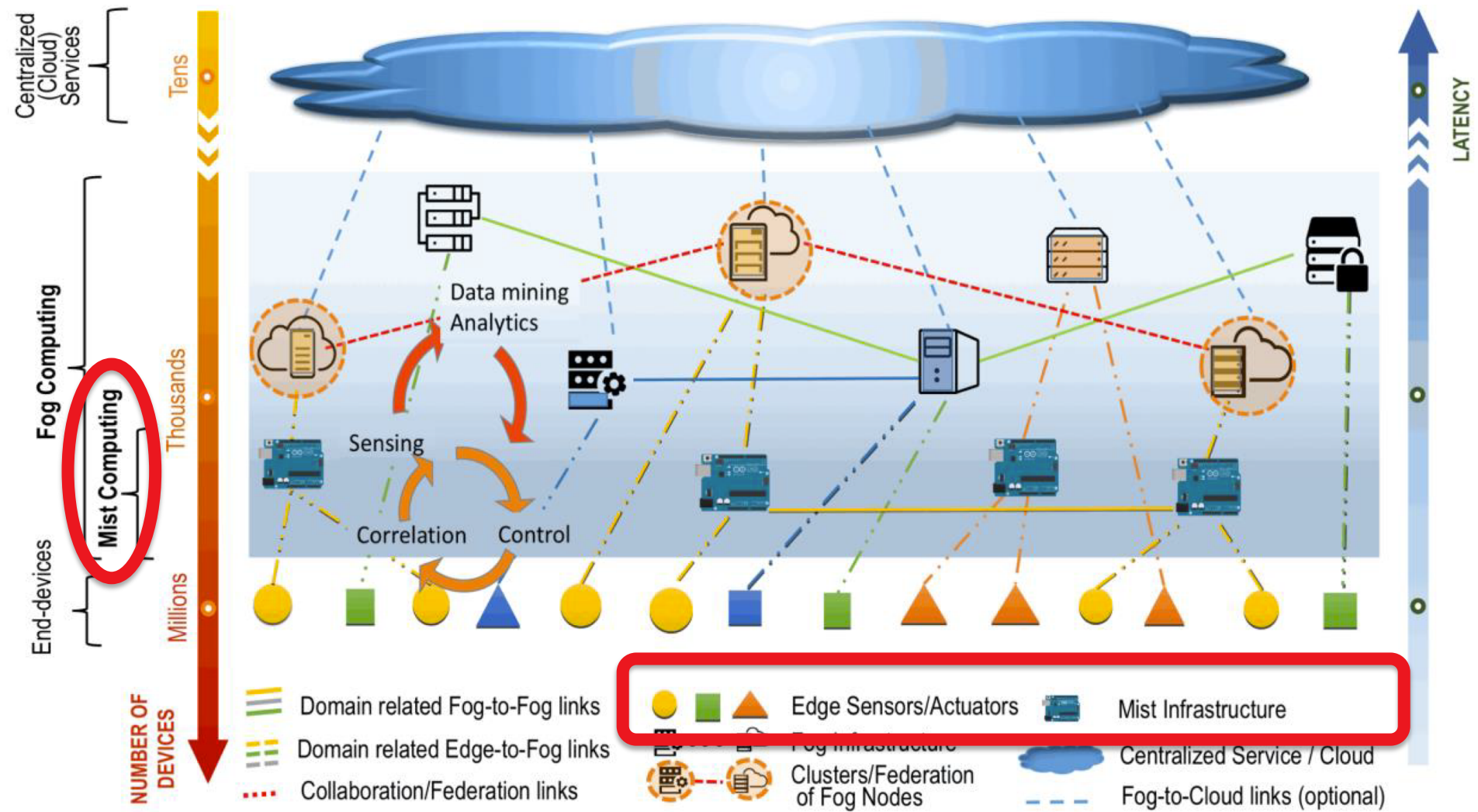
IMPACT AREAS



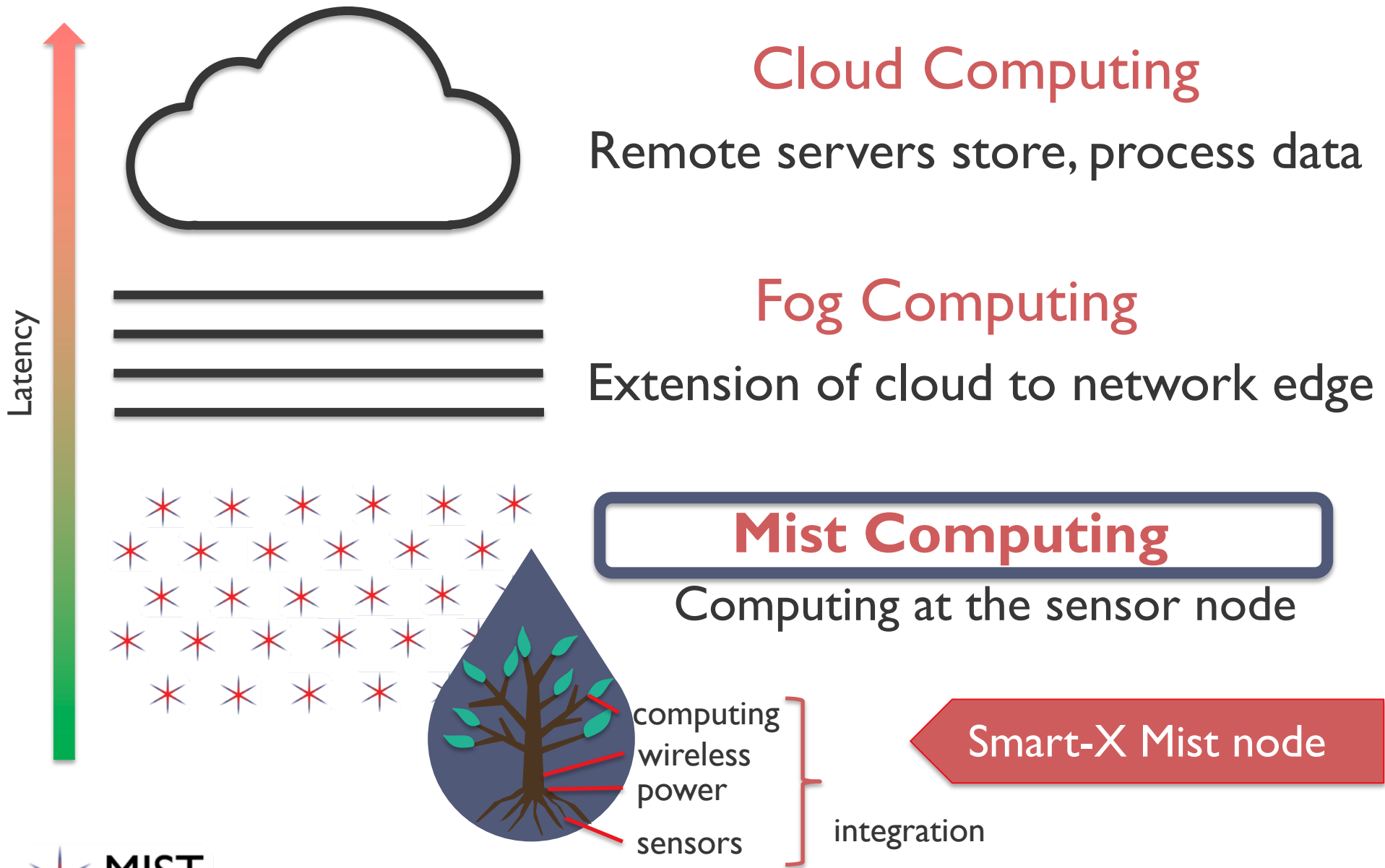
The Future

- According to the National Institute of Standards and Technology,
 - “Ubiquitous deployment of smart, interconnected devices is estimated to reach 50 billion units by 2020. This exponential increase is fueled by the proliferation of mobile devices (e.g. mobile phones and tablets), smart sensors serving different vertical markets (e.g. smart power grids, autonomous transportation, industrial controls, smart cities, wearables, etc), wireless sensors and actuators networks. **New concepts and technologies are needed to manage this growing fleet of Internet of Things (IoT) devices.**”

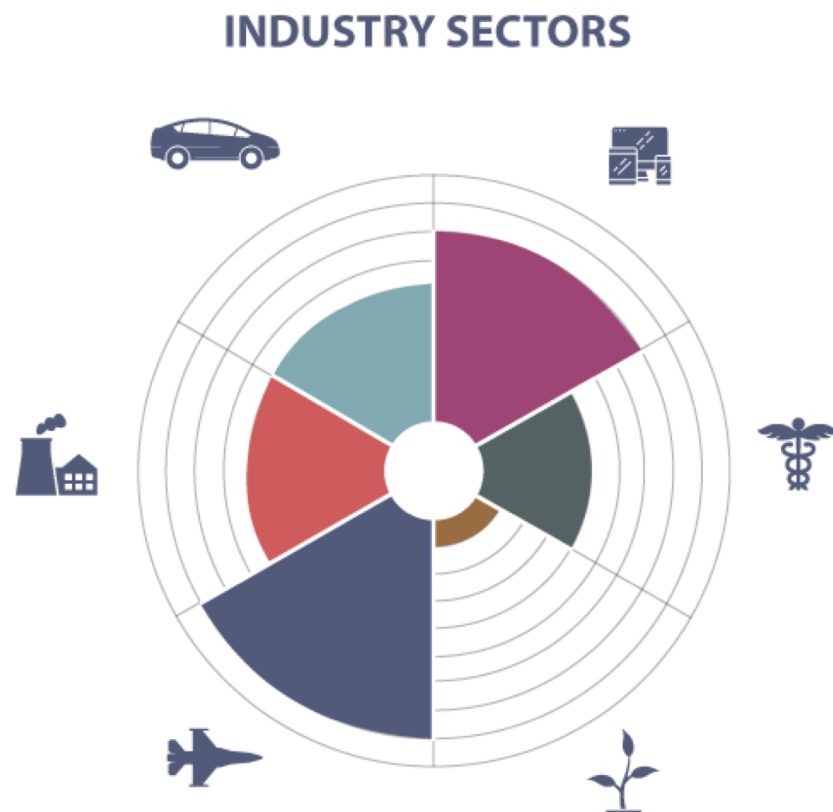
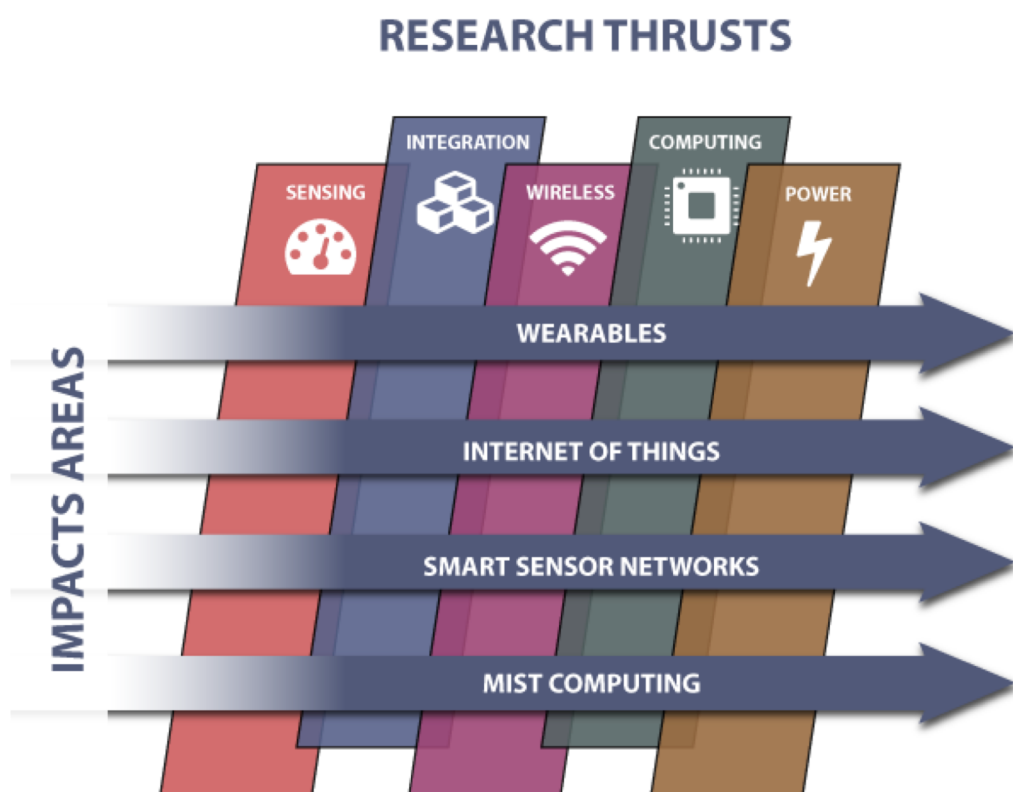
Cloud-Fog-Mist Computing



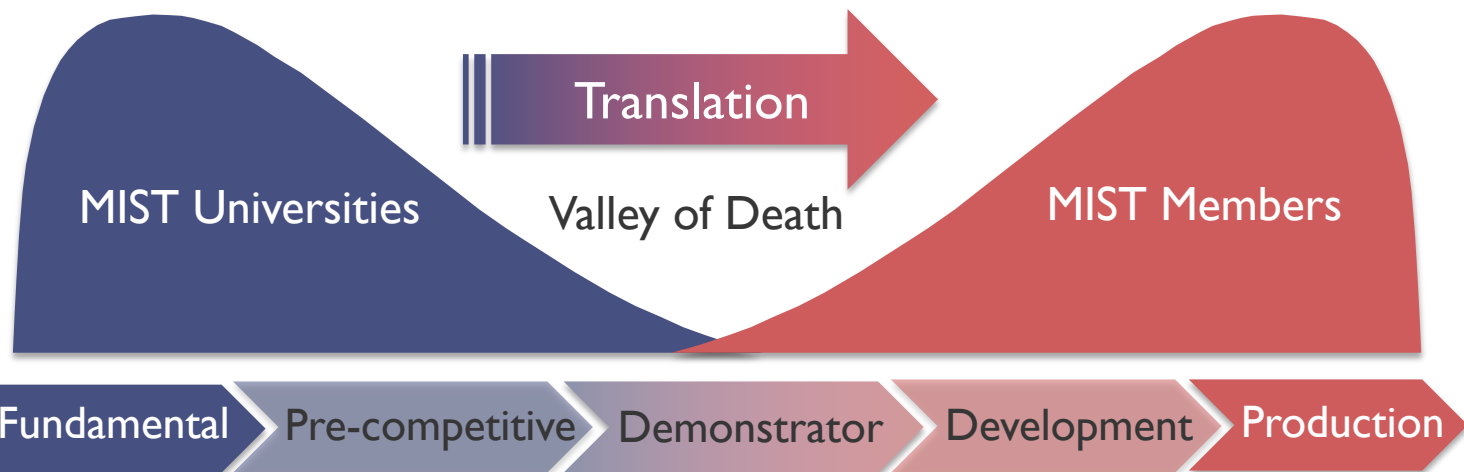
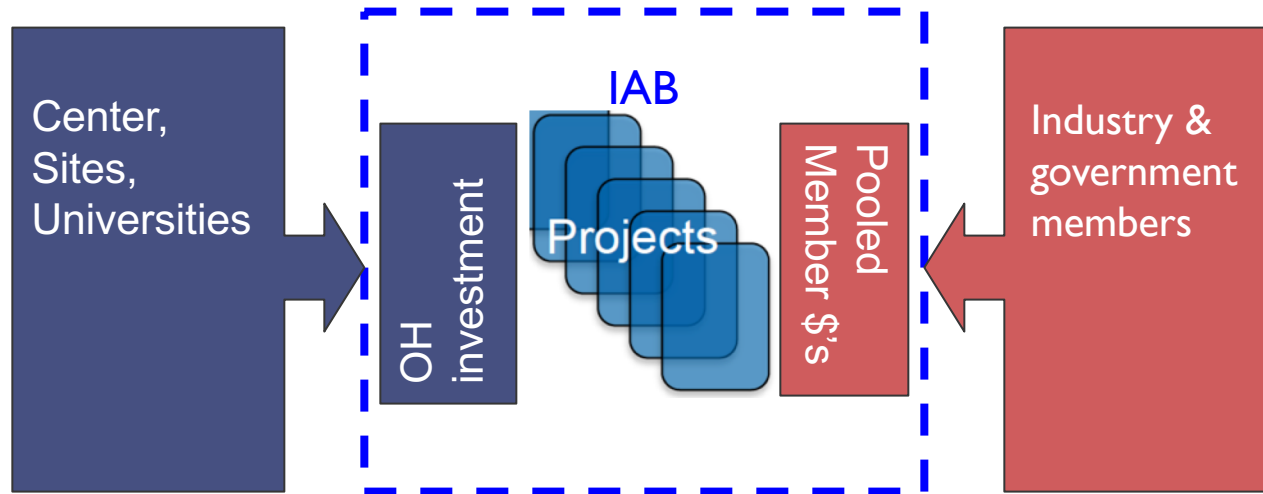
New Concepts—New Technologies



Strategic Roadmap



Role of MIST



Our Expertise

- 80+ members (faculty, doctoral, masters, undergraduate, administrative)
- 5 departments/schools
- Numerous faculty awards (NSF PECASE, NSF CAREER, ONR YI, etc.)

RESEARCH CAPABILITIES

INTEGRATION

- Advanced Packaging/3D-IC
- Atomic Layer Deposition
- Flexible/Printed Electronics
- Functional Materials (Oxides, Magnetics, Ferroelectrics, Piezoelectrics, Multiferroics)
- Interposers
- Laser Machining
- Microfluidic Cooling
- Nanomaterial Integration
- Nanomaterial Synthesis
- Nontraditional Substrates (Polymers, Glass, Sapphire, Paper)
- System Integration
- Through Si/Glass/Sapphire Vias



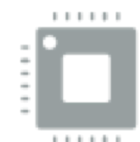
SENSING

- Biosensors
- Chemical Sensors (Nanowire Gas, GaN)
- Harsh Environment Sensors
- Imaging
- MEMS/NEMS
- Microfluidics
- Micro Optical Systems
- Neural Interfaces
- Photonic/Infrared Sensors
- Physical Sensors (Acoustic, Inertial, Flow, Magnetic)
- Terahertz Sensors
- Thermal Sensors/Modeling



COMPUTING

- Device Simulation and Modeling
- Hardware for ML/AI
- IC Wearout and Recovery
- Low-Power Data Converters
- Low-Power Heterogeneous Devices
- Low-Power Logic/Memory (2D)
- Nanodevices, Ferroelectric/Ferromagnetic Devices)
- Mixed-Signal Design and Test
- Neuromorphic Computing
- Spatial Compute Architectures
- Wide-Bandgap Semiconductor Devices



WIRELESS

- Antennas
- Metamaterials
- Phononic Devices
- Photonic Devices and Circuits
- RF Circuits and Systems
- RF MEMS
- Terahertz Circuits



POWER

- Energy Harvesting
- Energy Storage
- Microscale Heat Exchange
- Power Electronics
- Power Semiconductor Devices
- Switched-Capacitor/Voltage Stacking
- Wireless Power Transfer



RESEARCH



- Leverage your money.
- Unlock IP.
- Slash overhead.

RECRUITING



- Discover rising stars.
- Recruit proven engineers.
- Develop targeted programs.

RELATIONSHIPS



- Join the right people.
- Connect with leaders.
- Build strategic relationships.

Join Our Member Companies



U.S. Army CERDEC
Night Vision &
Electronic Sensors
Directorate



CORNING



JABIL

J&L Tech



LEONARDO DRS

Namjeong Foundation



NORTHROP GRUMMAN



RENESAS

† indicates two memberships

MIST Center Leadership Team



UNIVERSITY OF
CENTRAL FLORIDA



Toshi Nishida
Center Director



David Arnold
Center Deputy
Director

+41 faculty



Peter J. S. Yuan
Site Director



Joe H. J. Cho
Site Deputy
Director

+22 faculty



Avik Ghosh
Site Director



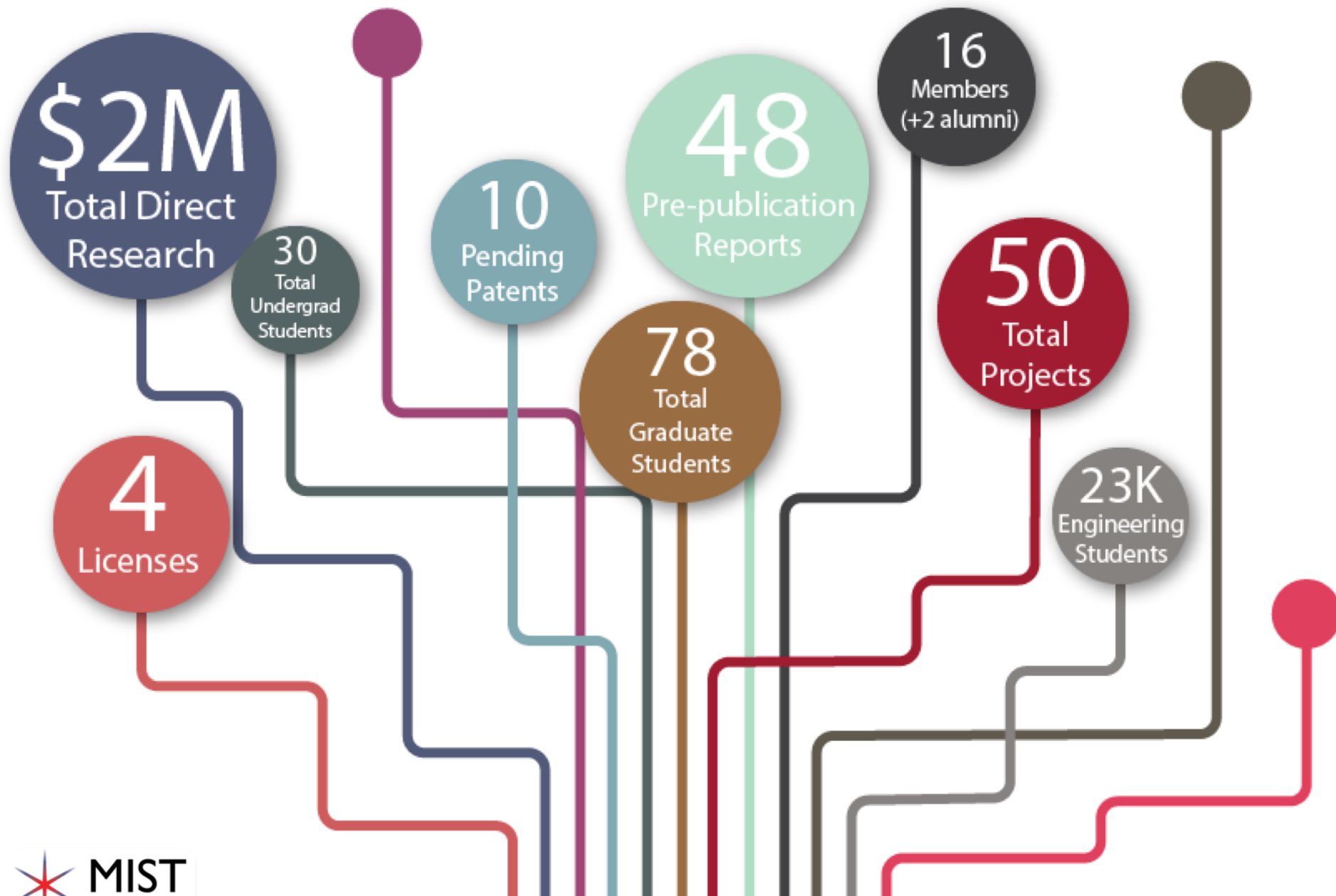
Patrick Hopkins
Site Deputy
Director

+17 faculty



Shelby Powell
Center Coordinator

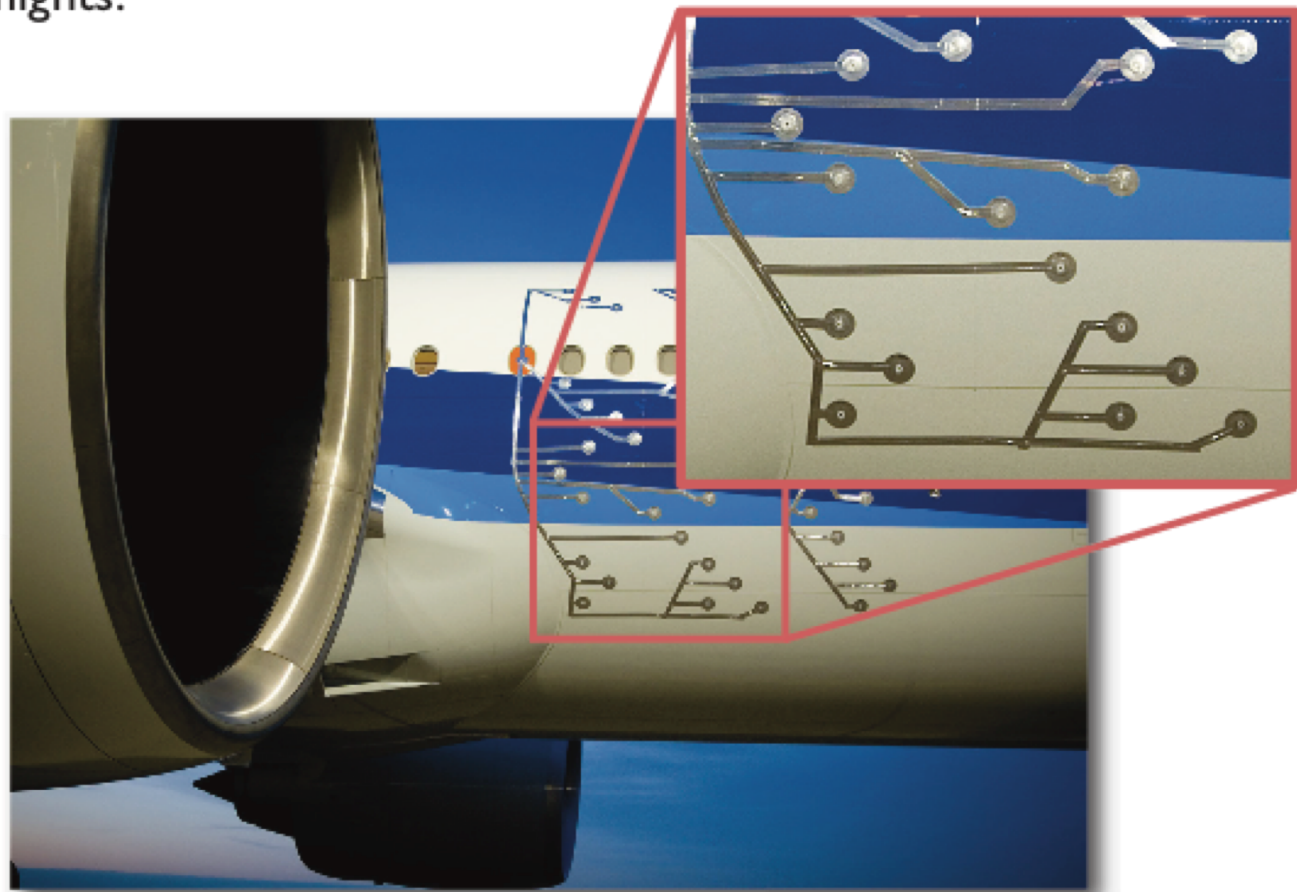
MIST Center By the Numbers



Outcomes



The MIST Center has developed aeroacoustic pressure sensor technology that is being transitioned to Boeing for in-flight fuselage measurements, which will ultimately lead to quieter flights.



Summary

- MIST Center enables members to Adapt and Embrace Technological Change
- Investment in the MIST Center provides high ROI
 - 16:1 leverage of a \$50k membership
 - 23,000 engineering students
- Why MIST Center?
 - Tools for Integrating Sensing, Computing, Wireless, and Power at each node to achieve mist computing



RESEARCH

- **Leverage your money.** Access a \$1M annual research portfolio for only \$50,000.
- **Unlock IP.** Enjoy royalty-free, non-exclusive licensing for all center intellectual property.
- **Slash overhead.** Over 90-percent of industry membership fees go directly toward research expenditures.



RECRUITING

- **Discover** rising stars with a vested interest in your organization.
- **Recruit** familiar, proven engineers and scientists.
- **Develop** targeted internship opportunities for our more than 23,000 highly skilled engineering students.



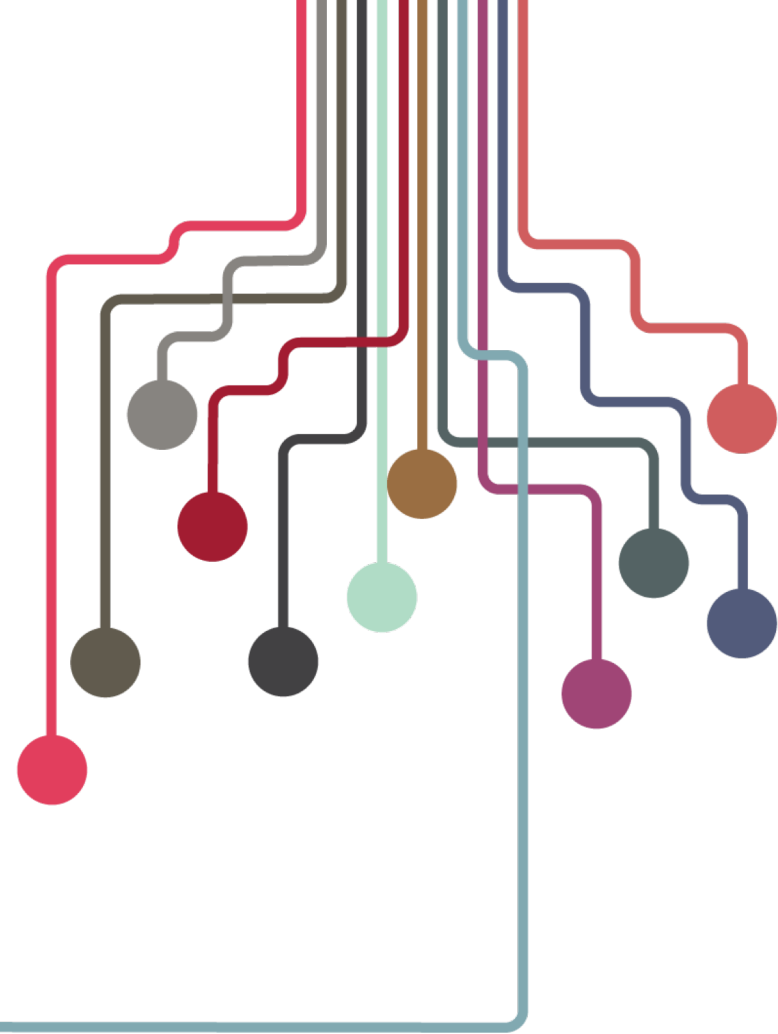
RELATIONSHIPS

- **Join** with the right people at the right time at the right place.
- **Connect** with the MIST Center's powerful conglomerate of intellectual minds.
- **Build relationships** with more than 40 cross-disciplinary faculty researchers at UF, UCF and UVA.



MIST CENTER

*Innovating More than Moore
hardware technologies for smart
systems in the Internet of Things era.*



To join, contact

Shelby Powell

MIST Center Coordinator

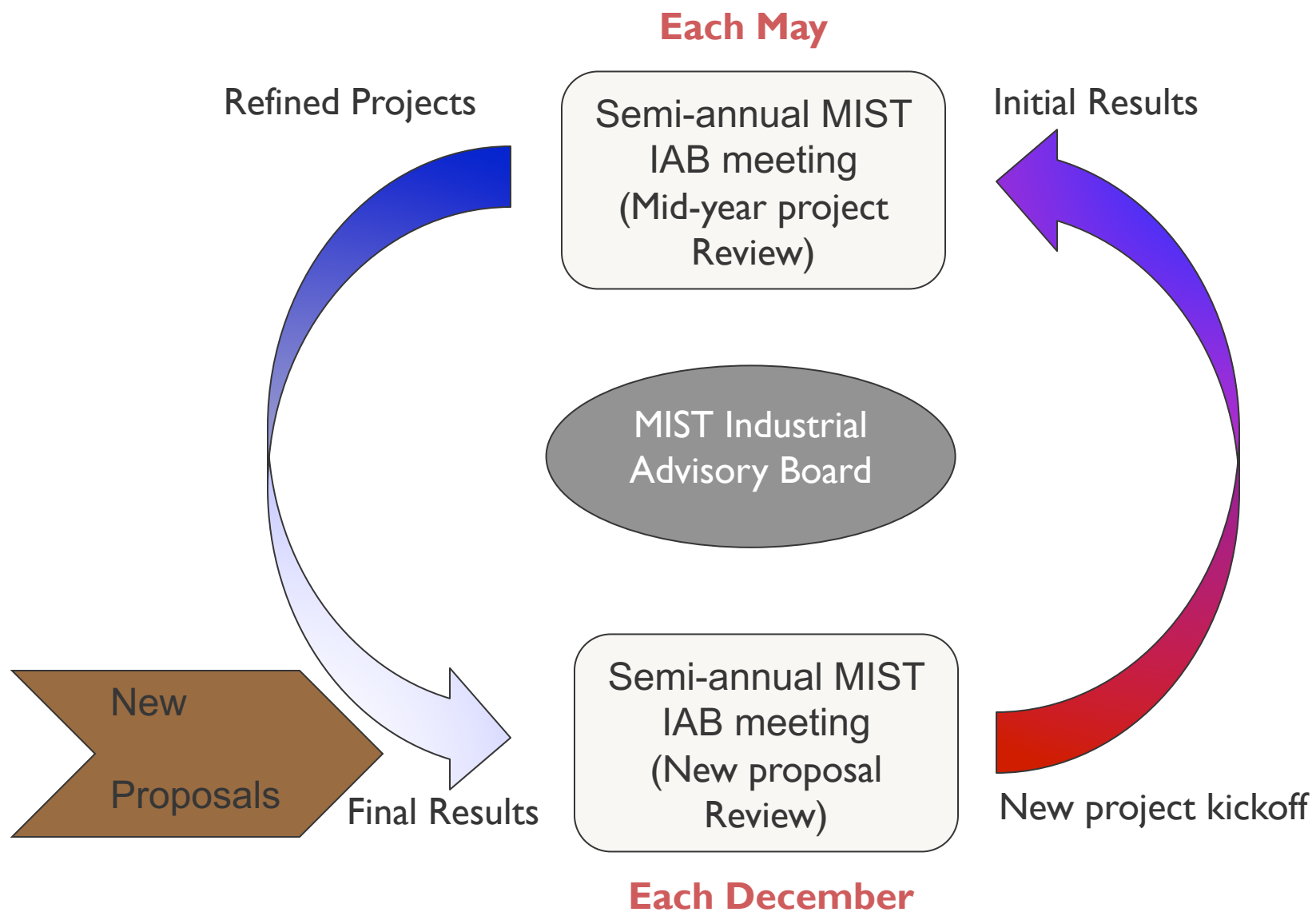
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Back Up Materials



MIST Center Annual Cycle



2019 MIST Center Project Selection Process

