Young Faculty Award (YFA) Recipients

Since the program's inception in 2006, we have nurtured the careers of more than 500 researchers from universities and nonprofit institutions across the nation.

2025

Principal Investigator	Institution	PM Mentor	Title
Sebastian Kube	University of Wisconsin	Andrew Detor	OxyBot: Autonomous Platform to Develop Oxidation-Resistant Alloys for Defense Applications 100x Faster
Matthew Powell Palm	Texas A&M Engineering Experiment Station	Keith Whitener	High entropy aqueous solutions for cryopreservation and beyond
William Putnam	University of California, Davis	Tabitha Dodson	Polaritoncatalyzed nuclear processes
Renee Zhao	Stanford University	Yannis Kevrekidis	SMART Spatiotemporal Metamaterials for AI guided wave Regulation via Thermal programming
Sho Takatori	Stanford University	Yannis Kevrekidis	Optogenetic control of programmable selfpropelled agents
Tuba Yavuz	University of Florida	Daniel Wallach	Constraint-Guided Local Fuzzing of Binaries
Bramwell Brizendine	The University of Alabama in Huntsville	Derek Bernsen	BEAST Binary Emulation and Analysis Simulation Technology for Advanced Malware Analysis and Anti-Forensic Countermeasures
Gioele Zardini	Massachusetts Institute of Technology	Erica Briscoe	CHORDATE Categorical Hierarchical Optimization for Robust Design of Adaptive Technologies
Yuxiong Wang	University of Illinois at Urbana Champaign	Howard Shrobe	Agentic Multimodal Video Understanding with Unified Reasoning, Perception, and Generation
Andrea Bajcsy	Carnegie Mellon University	Matthew Marge	Unifying Uncertainty and Safety for Embodied AI Agents
Nicola Bezzo	The Rector and Visitors of the University of Virginia	Matthew Marge	LLM Embodiment for Collaborative Autonomy
Alexander Marder	Johns Hopkins University	Michael Lack	ASSURE Avoiding Sophisticated Surveillance on User equipment through Real-time Evaluation
Francesco Restuccia	Northeastern University	Nathaniel Bastian	RADAR Resource Aware Dynamic Adaptation for Resilient DNNs in Low SWaP Tactical Systems
Ryan Shandler	Georgia Institute of Technology	Victoria Romero	Combating Downstream Information Confidence Effects (CoDICE)
Arun Mannodi Kanakkithoi	Purdue University	Anna Tauke-Pedretti	Accelerated Atomistic-Level Prediction of Material Synthesizability and Defect Behavior
David Burghoff	University of Texas at Austin	Justin Cohen	FLASHES Frequency Locked Arrays for Scalable High Energy Sources

Principal Investigator	Institution	PM Mentor	Title
Robert Jacobberger	The Board of Regents of the University of Wisconsin System	Todd Bauer	Epitaxy of Wafer-Scale, Single-Crystal Diamond on Non-Lattice-Matched Substrates
Biswajit Ray	Colorado State University	Todd Bauer	Passive Radiation Detector Utilizing 3D NAND Memory
Gang Qiu	University of Minnesota, Twin Cities	Yogendra Joshi	Cooling-on-demand Using an Electron Hydrodynamic Refrigerator
Christopher Anderson	University of Illinois Urbana Champaign	Yogendra Joshi	Efficient cryogenic optical interconnects with STO photonics
Bruno Azeredo	Arizona State University	Christine Sanders	Self-Disintegrating, Passive, Structural Elements with Biodegradability
Jaime Cardenas	University of Rochester	Clark McGehee	Weak Value Accelerometry for Next Generation PNT
Tam Nguyen	University of Maryland	James Shoemaker	Rapid Discovery of Very Faint Space Objects
Nils Napp	Cornell University	Kevin Sloan	Fast Multi Objective Optimization for Agile Systems Design
Dazhong Wu	University of Central Florida	Michael Mulqueen	Artificial Intelligence Enabled Affordable and Scalable Additive Manufacturing Part Qualification
Aline Eid	University of Michigan	Paul Jaffe	Fully Scalable mmWave Retrodirective Power Beaming Architecture

2024

Principal Investigator	Institution	PM Mentor	Title
Yang Lin	University of Rhode Island	Adam Willis	Precision in Miniature: Revolutionizing MPS with Digital Acoustofluidics and Nanoscale 3D Printing
Jinghua Li	The Ohio State University	Adam Willis	Spatially resolved, non-genetic optoelectronic modulation of neuronal activities with a monolithic photoelectrode
Samuel Oliveira	North Carolina A&T State University	Christopher Bettinger	Spatial-temporal Dynamics for Predictive Multiscale Models of Multi-cellular Circuit
Aashish Manglik	University of California San Francisco	Michael Feasel	Targeting allosteric sites for seek and destroy countermeasures for opioid poisoning
Craig Wilen	Yale University	Tiffany Prest	Rapid Identification of Viruses and Ligands (RIVAL)
Laura Kim	University of Florida	Mukund Vengalattore	Room-Temperature Strong Coupling in Intercalated 2D Plasmonic Systems
Maria Sakovsky	Stanford University	Andrew Detor	Embodied Structural Computing for Real-Time Stiffness Adaptation
Yiyang Li	University of Michigan	Keith Whitener	EMI-resilient nonvolatile memory using oxygen ion devices
Jairo Alberto Diaz Amaya	Rochester Institute of Technology	Keith Whitener	Osmotic Signalers for Functional Materials
Alexandra Paterson	University of Kentucky	Keith Whitener / Susan Swithenbank	Converting underwater noise pollution into electricity: Acoustic sensors to make informed decisions for unmanned underwater vehicles
Saad Bhamla	Georgia Tech Research Corporation	Kevin Sloan / Susan Swithenbank	Squid-Inspired Nozzles for Enhanced Efficiency and Thrust in Rotary Propulsors
Stephanie Gil	Harvard University	Nathaniel Bastian	Characterizing and Mitigating Adversarial Impacts on Multiagent Reinforcement Learning
Mahdi Hosseini	Northwestern University	Sunil Bhave	Coherent Levitation of Macroscopic Sensors
Patricia Alves-Oliveira	Regents of the University of Michigan	Thomas Schenkel	Authenticity Markers in Artist-Robot Interaction
Haizhao Yang	University of Maryland College Park	Yannis Kevrekidis	Theoretical and Algorithmic Foundation of Interpretable Reinforcement Learning for Intelligent Computation and Modeling
Peng Bai	University of Massachusetts Amherst	Yannis Kevrekidis	Deep Learning for Discovering Optimal, Synthesizable Inorganic Porous Materials
Shaofeng Zou	Arizona State University	Alvaro Velasquez	Continual Reinforcement Learning: Forgetting, Generalization and Robustness
Jia (Kevin) Liu	Ohio State University	Alvaro Velasquez	Decentralized Sequential Decision Making in the Data-Limited Regime: A Self-Supervised Pretrained Foundation Model Approach

Principal Investigator	Institution	PM Mentor	Title
Christopher De Sa	Cornell University	Alvaro Velasquez	Decentralized Online Parameter-Efficient Fine-Tuning of Compressed Models
Frederic Sala	University of Wisconsin	Alvaro Velasquez	Active Adaptation for Decentralized Foundation Models
Rose Yu	University of California San Diego	Erica Briscoe	Grounding LLMs with Physical Laws
Thirimadura Charith Mendis	University of Illinois at Urbana Champaign	Howard Shrobe	Language and Hardware Adaptive Representations and Techniques for Compiling Heterogeneous Workloads
Priyanka Raina	Stanford University	Howard Shrobe	A Fast Design Space Exploration Framework and Compiler for Heterogeneous Systems with Neural Network Accelerators
Ellie Pavlick	Brown University	Matthew Marge	Discovering and Controlling Emergent Symbolic Mechanisms in Neural Networks
Mushuang Liu	University of Missouri	Victoria Romero	Towards Adaptable and Socially Intelligent Reinforcement Learning
Amir Arbabi	University of Massachusetts, Amherst	Anna Tauke-Pedretti	Metalens-Imaged Optical Coupler Arrays
Scott Cushing	California Institute of Technology	Justin Cohen	Cascaded Thin-Film Lithium Niobate Photonic Circuits Create Entangled Photon Triplets
Carter Yagemann	Ohio State University	Lok Yan	End-to-End Modeling and Mitigation of Fault Injection Attacks
Ognjen Ilic	University of Minnesota, Twin Cities	Yogendra Joshi	University of Minnesota, Twin Cities, Ultralightweight Nanophotonic Radiators for Adaptive and High-Power Heat Rejection
Jonathan Singer	Rutgers University	Hunter Martin	Formable Ordered Microcomposite Energetics
Christopher Limbach	University of Michigan	Michael Nayak	View-Obstructed Delivery of Lunar Power by Optomechanically Guided Beams
Savio Poovathingal	University of Kentucky	Martiqua Post / Sarah Popkin	Gas-surface scattering dynamics in very low Earth orbit
Steven Berg	Rutgers University	Martiqua Post / Sarah Popkin	Data Driven Engineering for VLEO Spacecraft Aerodynamic Performance Enhancement

2023

Principal Investigator	Institution	PM Mentor	Title
Weinan Xu	University of Akron	Catherine Campbell	Hierarchical Biocomposites with Exceptional Thermal Conductivity from Synergistic Microbial Biosynthesis
Ryan Truby	Northwestern University	Catherine Campbell	Biocompatible Soft Batteries via Bundles of Axon-Inspired, Ionogel Composite Fibers
Aaron Morris	University of Michigan	Chris Bettinger	Implantable Tissues with Engineered Cells to Detect and Fight Sepsis
Joerg Werner	Boston University	Leonard Tender	Ultrathin Sorbent Coatings with Bio-inspired Multi-ligand Binding Sites for Energy-efficient Capture and Release of Carbon Dioxide
Timothy Balmer	Arizona State University	Roozbeh Jafari	The Role of Descending Auditory Signals in Neuronal Hyperactivity and Tinnitus
Hongyu Zhou	University of Tennessee, Knoxville	Tiffany Prest	Moss-Embedded Living Building Materials for Acre-scale Landscape Cooling
Andrew Gross	University of South Carolina	Andrew Detor	Extraction of many Material Properties from Analysis of a few data rich experiments
Ian McCue	Northwestern University	Andrew Detor	Learning Material Properties Through High-Speed Image Acquisition During Subtractive Machining
Justin Little	University of Washington	Michael Nayak	Power Extraction from Mini-Magnetosphere Polarization Fields
Mattias Fitzpatrick	Dartmouth	Mukund Vengalattore	Non-Reciprocal Lattices of High-Q Microwave cavities for Enhanced Magnetometry
Rahim Esfandyarpour	University of California, Irvine	Sunil Bhave	Wireless, self-powered, triboelectric-nanogenerator-resonance force sensing array
Talia Ringer	University of Illinois at Urbana-Champaign	Alvaro Velasquez	Relation Learning for Proof Automation - PRICELESS
Priyadarshini Panda	Yale University	Howard Shrobe	µMAS: Micro-Macro Hardware-Algorithm Architecture Search for Edge Efficiency
Aatmesh Shrivastava	Northeastern University	Howard Shrobe	Nano-Watt Power Machine-Learning Hardware using Precision Analog Computing
Elias Bareinboim	Columbia University	Howard Shrobe	Causal Reinforcement Learning (CRL): Decisions, Explanations, and Generalizations
Shon Cook	SRI International	John-Francis Mergen	Vehicular Reconfiguration and Rapid Repairs for Remote, Outlying Operations using ML (VRRRROOM)
Maria Gorlatova	Duke University	Matthew Wilding	Runtime Identification of Detrimental Augmented Reality (AR) Experiences through AR-specific Quality of Experience (QoE) Modeling and Monitoring

Principal Investigator	Institution	PM Mentor	Title
Ethan Secor	Iowa State University	Julian McMorrow	Aerosol Jet Printing of Bespoke Low-Loss Electronics with Nanocomposite Dielectrics
Alireza Marandi	California Institute of Technology	Justin Cohen	Few-optical-cycle nonlinear nanophotonic circuits
Kiyoul Yang	Harvard University	Justin Cohen	Integrated femtosecond pulse synthesizer
Matt Eichenfield	University of Arizona	Justin Cohen	Reconfigurable Single Chip Radio Frequency Signal Processor Architecture Search for Edge Efficiency
Siddhartha Ghosh	Northeastern University	Justin Cohen	Compound Semiconductor on Piezoelectric Strongly Confined Microacoustic Integrated Circuits (COSMIC) for RF Signal Processing
Mengjie Yu	University of Southern California	Justin Cohen	On-chip electrical synthesis of few-cycle light via optical frequency comb
William Renninger	University of Rochester	Justin Cohen	Contact-free travelling-wave Optomechanics for Acoustic Material Spectroscopy
Zhiting Tian	Cornell University	Thomas Kazior	Transient Nanoscale Temperature Mapping of Active RF Devices
Yuzhe Xiao	University of North Texas	Thomas Kazior	Exploring thermal properties of nanoscale wide bandgap semiconductors via ultrafast thermal-emission spectroscopy
Mohsen Imani	University of California, Irvine	Todd Bauer	Hyperdimensional Computing for Robust and Efficient Cognitive Learning
Xianming Dai	University of Texas at Dallas	Yogendra Joshi	Designing Flow-Separation Evaporative Cooling for 3D Heterogeneous Microsystems
Patrick McCormick	University of Kansas	Frank Robey	Enabling Spectrally Aware Cognitive RF Sensing (FP-005) Principal Investigator
Adam Webb	Michigan Technological University	Frank Robey	Shared Spectrum Target Detection and Track Estimation (STARDATE)

2022

Principal Investigator	Institution	PM Mentor	Title
Jerzy Szablowski	Rice University	Linda Chrisey	Therapeutics for Rapid Cold Adaptation - Beyond the Natural Human Capability
Congrui Grace Jin	University Nebraska-Lincoln	Matthew Pava	Creating a Synthetic Lichen
Yun Chen	Johns Hopkins University	Matthew Pava	Fibrosis, Inflammation, Revascularization, and Migration (FIRM) Modulation for Muscle Regeneration
Shelly Zhang	University of Illinois at Urbana-Champaign	Roozbeh Jafari	Wireless Magnetic Robot for Precise Hierarchical Control of Next-Generation Mechanotherapy for Tissue Regeneration and Injury Repair
Hang Yu	Virginia Polytechnic Institute and State University	Andrew Detor	Autonomous Solid-State Additive Repair of Aerospace Grade Aluminum Through In Situ Laser Acoustic Resonance Spectroscopic Measurement of Interface Strength
Owen Miller	Yale University	Jinendra Ranka	Fundamental limits to electromagnetic nonreciprocity via generalized conservation laws
Farnaz Niroui	Massachusetts Institute of Technology	Keith Whitener	Mechanical Neuromorhpic Metamaterials for Multifunctional Nanosystems
Maxim Shcherbakov	University of California, Irvine	Mukund Vengalattore	Strongly Correlated Material Systems and Sensors
Yan Shoshitaishvili	Arizona State University	Derek Bernsen	Shining Light on Occluded Vulnerabilities
Yinzhi Cao	Johns Hopkins University	Derek Bernsen	Abstract Modeling of Control- and Data-flow Guards of Inactive Vulnerabilities via Symbolic Object Graph
Ankur Mehta	University of California, Los Angeles	Howard Shrobe	Printable Mechanical Autonomy
Dorsa Sadigh	Stanford University	Matthew Marge	Learning and Influencing Conventions in Human-Machine Collaboration
Mohsen Lesani	University of California, Riverside	Matthew Wilding	Information and Vulnerability Flow Type Systems
Amir Houmansadr	University of Massachusetts Amherst	Mike Lack	Towards Theoretical Foundations for Information Controls
Syed Rafiul Hussain	Pennsylvania State University	Tejas Patel	Automated Reasoning and Repairing Framework for Systematic Assurance of 5G RAN Systems
Ying Wang	Stevens Institute of Technology	Tejas Patel	5G Causality, Formal Reasoning and Resilience
Cody Buntain	University of Maryland College Park	Victoria Romero	M3I – Maps, Models, and Metrics for Influence Efforts by State/Non-State Actors
Tim Horn	North Carolina State University	Andrew Detor	Electron Interactions with Microstructures and Defects During Additive Manufacturing

Principal Investigator	Institution	PM Mentor	Title
Yanghyo Kim	Stevens Institute of Technology	Jason Woo	Energy-Efficient and MIMO Approaches on Millimeter-Wave Dielectric Fibers and Wireless Interconnects for Space Missions
Timothy Koeth	University of Maryland, College Park	Michael Sangillo	A Project to Catechize Dielectric Charging (ACDC)
Gregory Falco	Cornell University	Greg Kuperman	Orbital Resilient Blockchain Interagent Transaction Service (ORBITS) Architecture: a Resilient, Zero-Trust Architecture for Hosted Payloads and Space Infrastructure as a Service
John Lipor	Portland State	Katherine Woolfe	Information-Driven Sensor Management via Nonparametric Divergence Estimation
Florian Meyer	University of California, San Diego	Katherine Woolfe	Active Planning for Geoacoustic Inversion
Christopher Brinton	Purdue University	Tamer Rafaei / Nicholas Chang	FL-NTN: Fog Learning Orchestration of Heterogeneous Model Training across Hybrid Terrestrial and Non-Terrestrial Network Systems
John Hwang	University of California, San Diego	Paul Jaffe / John "Venkman" Casey	Large-scale multidisciplinary design optimization of power-beaming-enabled air platforms
Amrita Basak	Pennsylvania State University	Salvatore Buccellato	Enabling Fabrication of Large-Scale IN625 Parts Using Multi-Laser Powder Bed Fusion
Byron Boots	University of Washington	Stuart Young	Efficient, Agile, Decentralized Autonomy via Composable Policies
Giuseppe Loianno	New York University	Stuart Young	Integrated Visual Perception, Learning, and Control for Super Autonomous Robots

2021

Principal Investigator	Institution	PM Mentor	Title
Scott Medina	The Pennsylvania State University	Christopher Bettinger	Enhancing the Ambient Stability of Biologics through Fluorous Dispersion
Johnatan Aljadeff	University of California San Diego	Gopal Sarma	Electrical coupling between sensory receptor neurons: a shortcut mechanism for swift execution of a motor program
Achuta Kadambi	The Regents of the University of California, Los Angeles	JP Chretien	MMHEALTH: Multimodal Health Sensing to Identify COVID-19 Signatures
Todd Gaines	Colorado State University	Kristen Jordan	RNA-targeting to control invasive plant species
Deva Chan	Purdue University	Lenny Tender	Microbiome Regulation of Glycosaminoglycan in the Synovial Joint
Jie Fu	University of Florida	Jinendra Ranka	Game-Theoretic Reasoning and Synthesis of Defense with Strategic Deception and Counter-Deception
Katerina Fragkiadaki	Carnegie Mellon University	Lael Rudd	From 3D Perception to Spatial Intelligence: Self-supervising Hierarchical Neural 3D Perceptual Simulators for Transfering Learned Physics and Policies across Views, Objects, Scenes and Tasks
Jason Lo	The University Corporation at CSUN	Lael Rudd	A homological approach to machine reasoning
Ayaskanta Sahu	New York University	Mukund Vengalattore	Exploiting strong coupling between colloidal quantum dots and avalanche amorphous-selenium for high performance hybrid mid-wave infrared sensors and detectors
Jie Gao	Missouri University of Science and Technology	Rohith Chandrasekar	Upconversion photoluminescence from 2D materials with strain-enabled broadband operation
Thomas J. Kempa	Johns Hopkins University	William Carter	Multifunctional Exoskeletons from Robust and Responsive 2D Molecular Frameworks
Rachel Cummings	Columbia University	Daniel Wallach	Guarding Against User Misperceptions of Differential Privacy
Hao Zhang	Colorado School of Mines	John-Francis Mergen	Autonomous Group Introspective Learning and coopEitition (AGILE) for Cross-Capability Multi-Robot Adaptation
Paul Gazzillo	University of Central Florida	Mark Flood	Tracking Corporate Relationships at Scale
Georgios Portokalidis	Stevens Institute of Technology	Sergey Bratus	Effective Software Monitoring Leveraging Hardware Debugging Extensions
Mark Finlayson	Florida International University	Victoria Romero	Computational Narrative Representations for Information Operations
Tingyi Gu	University of Delaware	Anna Tauke-Pedretti	Chiral exceptional point manifested active tuning in intergrated photonics
Kai Ni	Rochester Institute of Technology	Jason Woo	A Material-Device-Circuit Co-Design of Reliable and Logic-Compatible Hfo2 based Ferroelectric FET

Principal Investigator	Institution	PM Mentor	Title
Asif Islam Khan	Georgia Institute of Technology	Jason Woo	Engineering the gate-dielectric stack in ferroelectric field-effect transistors
Elaheh Ahmadi	University of Michigan	Thomas Kazior	GaN/ Ga2O3 wafer-Bonded Aperture VErtical Transistor (BAVET) for RF applications
Najme Ebrahimi / David Arnold	University of Florida	Thomas Kazior	Miniaturized and Power-Efficient MMW Arrays with Precise Electrical and Thermal Optimization for Future Low Cost Standardization
Aaswath Pattabhi Raman	University of California, Los Angeles	Yogi Joshi	Compact Efficient Cryogenic Electroluminescent Coolers
Michael Haberman	The Univ. of Texas at Austin, DBA Applied Res. Lab	Hunter Martin	Acoustic and vibration sensing metamaterials enabled by electro momentum coupling
Grace X. Gu	The Regents of the University of California, Berkeley	Hunter Martin	Piezoelectric metamaterials with engineered electro momentum coupling
Arka Majumdar	University of Washington	Justin Cohen / Robert Saperstein	Optically rewritable photonic integrated circuits based on phase change materials
Liang Feng	University of Pennsylvania	Justin Cohen / Robert Saperstein	Programmable lithography-free integrated photonics for signal control and networking
Sashank Narain	University of Massachusetts Lowell	Nicholas Chang	Secure privacy preserving access to networks with ML (SpanML)
Caterina Lamuta	University of Iowa	CDR Kyle Woerner	Cephalopods-inspired Self-morphing Stretchable Soft Skin from Twisted and Coiled Artificial Muscles
Stuart Laurence	University of Maryland	Lt. Col. Josh Stults	Free-flight force and moment measurement in hypersonic impulse facilities using multi camera telecentric visualization and massively parallel scene reconstruction
Ifana Mahbub	University of North Texas	Paul Jaffe	Next generation of wireless power transfer network of Unmanned Aircraft System using electromechanical beamforming
Suo Yang	University of Minnesota	Richard Wlezien	Hypersonic Sonic Boom Theory based on Line-Distributed Energy Impulse Source: Lift, Shape, and Thermochemistry
Steven A. E. Miller	University of Florida Board of Trustees	Richard Wlezien	Analytical Prediction of Near-Field Hypersonic Aerodynamics

2020

Principal Investigator	Institution	PM Mentor	Title
Warda Ashraf	The University of Texas at Arlington	Catherine Campbell	Recreated Roman concrete (RRC) using alkali-activated Calcined Clay
Daniel Kulp	The Wistar Institute	Kristen Jordan	A machine learning algorithm to accelerate development of in vivo DNA-vectored antibody countermeasures for the warfighter
Mehdi Javanmard	Rutgers University	Leonard Tender	Lab-on-a-Microparticle: Injectable Wirelessly Powered Label-free Nanowell Sensors for In Vivo Quantification of Protein and Small Molecules
Mark Blenner	Clemson University	Linda Chrisey	Embedding bio-sentinels in the indoor microbiome to remediate airborne threats
Ishan Chattopadhyay	The University of Chicago	Bartlett Russell	Quantification of Cognitive Dissonance via Recursive Decision Forests
Andrew Schwartz	Stony Brook University	Bartlett Russell	DiReCCT Dissonance: Quantifying Relations in Human Beliefs using Deep Learning and Computational Linguistics.
Pierluigi Nuzzo	University of Southern California	Jinendra Ranka	Scalable Exploration of AI-Enabled, Reliable, and Cost- Effective Architectures (SEARCH)
Edmon Perkins	North Carolina State University	Vishnu Sundaresan	Flexible Reservoir Computing Tensegrity Robots
Jordan Raney	University of Pennsylvania	Vishnu Sundaresan	Distributed intelligence in kirigami-inspired flexible architectures
Meredith Silberstein	Cornell University	Vishnu Sundaresan	Theory and Realization of Bioinspired Polyelectrolyte-Based Soft Matter Circuits
Hang Ren	Miami University	William Carter	Nanoscale revelation of the nucleation of corrosion
Florian Schaub	Regents of the University of Michigan	Joshua Baron	Enabling Comparative Analysis of Privacy Expectation-Risk Misalignments in Exposure-sensitive Populations
Michelle Mazurek	University of Maryland	Joshua Baron	Generalizing to Understudied Populations Through the Lens of Key Privacy Challenges
James Fairbanks	Georgia Tech Research Institute	Joshua Elliott	Model Aware Computing with Scientific Categories
Benjamin Gyori	President and Fellows of Harvard College	Joshua Elliott	Collaborative scientific discovery with semantically linked machine-built models
Julian Rrushi	Oakland University	Tejas Patel	A Quest for the Physics of Cyberspace
Wenjuan Zhu	University of Illinois at Urbana-Champaign	Benjamin Griffin	Advanced Tandem Gate Dielectrics for High-Temperature Electronics
Jon Ihlefeld	University of Virginia	Benjamin Griffin	Resilient epitaxial gate oxides for high performing
Yahya Tousi	Regents of the University of Minnesota	James Wilson	Wideband and interference-resilient mixed mode time transfer for distributed radios
Quntao Zhuang	Arizona Board of Regents, University of Arizona	Joe Altepeter	Distributed quantum sensor networks enhanced by quantum error correction

Principal Investigator	Institution	PM Mentor	Title
Justin Metcalf	The University of Oklahoma	Thomas Rondeau	Defining the Utility of the Electromagnetic Spectrum
David Hill	SRI International	Jeffrey Maas	2D Electron Gas Geometric Diode Rectenna
Saeed Zeinolabedinzadeh	Arizona State University	Jeffrey Maas	Novel Analog Wireless Synchronizing Scheme for Extremely Low Latency Time Transfer
Phili Muscarella	SRI International	John Waterston	Floating Integrated Through-the-Sensor Simulation (FITS)
Kaixuan Ni	University of California, San Diego	Mark Wrobel	Single-electron Sensitive Liquid Xenon Detector for Reactor Antineutrino Monitoring
Prasanna Balachandran	University of Virginia	William Carter	Accelerated Design of Ultra Low Density High Entropy Alloys for Extreme Environments using Artificial Intelligence and Density Functional Theory
Jay McMahon	The Regents of the University of Colorado	Ana Saplan	Soft-robotic, Propellant-Free Servicers for LEO Spacecraft
Richard Linares	Massachusetts Institute of Technology	Ana Saplan	A Paradigm Shift in the Space Enterprise via Servicing for LEO Mega Constellations
Chloe Dedic	The Rector and Visitors of the University of Virginia	Sarah Popkin	Spatially-Resolved Measurement of Temperature and Species to Investigate Fuel/Air Mixing and Flame Stability in a Partially-Premixed Scramjet Combustor

2019

Principal Investigator	Institution	PM Mentor	Title
Colleen Doherty	North Carolina State University	Blake Bextine	Strategic Design and Development of a Plant Bio-mining System to Sustainably Harvest Rare Earth Elements from Domestic U.S. Sources
Parijat Bhatnagar	SRI International	Eric Van Gieson	Remote Regulation of Cellular Medicine with Extracorporeal Devices
Yu Yao	Arizona State University	Lori Adornato	Underwater Polarization Navigation Based on Chip-integrated Full-stokes Polarization Imaging System
Keriann Backus	University of California, Los Angeles	Tristan McClure-Begley	Covalent Modulators of Proteostasis
Nick Vamivakas	University of Rochester	Joseph Altepeter	Quantum Concepts in Classical Optics
Denys Bondar	Tulane University	Joseph Altepeter	Quantum Reservoir Engineering Inspired Classical Optical Technology
Pierre-Emmanuel Gaillardon	University of Utah	Mark Wrobel	Smart City Threat Detection Using Integrated Chemical Sensing and Machine Learning
Corie Cobb	University of Washington	William Carter	Additive Manufacturing for High-Energy-and-Power Multi-Functional 3D Batteries
Tudor Dumitras	University of Maryland	Joshua Baron	Transferable Factors of Updating Behavior for Predicting Vulnerability of Patching and Exploitation
Simon Garnier	New Jersey Institute of Technology (NJIT)	Joshua Elliott	Ant Colonies as an Animal Model to Understand the Economic, Environmental and Conflictive Drivers of Mass Migrations
Walter Lasecki	University of Michigan	Joshua Elliott	Hybrid Intelligent Agents for Deploying Robust AI Systems
Matthew Hicks	Virginia Polytechnic Institute and State University	Keith Rebello / Lok Yan	Digital Techniques for Exposing and Eliminating Information Hidden in SRAM's Analog Domain
Omar Haider Chowdhury	University of Iowa	Raymond Richards	A Principled Approach to Identifying Cellular Network Attacks
Jeff Huang	Texas A&M Engineering Experiment Station	Sergey Bratus	SmartScript: A Learning-based Approach to Static Type and Semantic Inconsistency Analysis of Dynamic Scripts (and Other Semi-Structured Code)
Jeehwan Kim	Massachusetts Institute of Technology	Whitney Mason/ Anna Tauke-Pedretti	Dislocation-free heteroepitaxy of IR devices by remote epitaxy
Amir Safavi-Naeini	Stanford University	Gordon Keeler	A General and Ultra high-performance Platform for Nonlinear Photonics
Qing Li	Carnegie Mellon University	Gordon Keeler	Visible and mid-infrared frequency comb generation in wide-bandgap photonic materials
Chung-Tse Michael Wu	Rutgers University	James Wilson	Metamaterial Integrated Ultra-Broadband Antenna Array with Embedded Reconfigurable Non-Foster Circuits

Principal Investigator	Institution	PM Mentor	Title
Roozbeh Tabrizian	University of Florida	Timothy Hancock	Ferroelectrically Transduced Ge Nano-Fin Bulk Acoustic Resonators for Chip-Scale Instinctually Adaptive RF Spectral Processing
Loai Salem	University of California Santa Barbara	Timothy Hancock	Fully-Integrated Tunable N-Path Frequency-Selective Limiters for Self-Adaptive Interference Suppression
Jason Kawasaki	University of Wisconsin Madison	Whitney Mason	Mismatched epitaxy of infrared device materials using graphene-mediated lateral overgrowth
Xiaoyu (Rayne) Zheng	UCLA	William Carter	Additive Manufacturing (AM) of Highly Responsive Piezoelectric Materials with 3D Addressable Electrode Interfaces and Strain Amplifications
Reginald F. Hamilton	Pennsylvania State University	William Carter	Additive Manufacturing of Functional Hierarchical Shape Memory Alloys
Vishal Saxena	University of Delaware	Gordon Keeler	Silicon Photonics enabled Reconfigurable Optical Analog Processor
Abhijit Mahalanobis	University Central Florida	Jiangying Zhou	Minimum L1 norm specialist networks for learning sparse active pathways
Luat Vuong	University of California, Riverside	Jiangying Zhou	Rapid and Robust Processing in Spatially-multiplexed Optical Systems: Leveraging Lattice Defects for Pyramid Learning
Takashi Tanaka	University of Texas at Austin	Jiangying Zhou	Rationally Inattentive Predictive Vision via Directed Information Regularization
Ting-Yen Shih	University of Idaho	Rohith Chandrasekar	A Machine Learning Approach to Automated Non Foster Circuit Synthesis
Koki Ho	Georgia Technical Research Corporation	Ana Saplan	Time-expanded Space Logistics Network Modeling and Optimization for On-orbit Servicing, Assembly, and Manufacturing
Fabio Semperlotti	Purdue University	Joshua Stults	A variable and multi-fractional order computational mechanics framework: Simulation, optimization, and monitoring of hypersonic structures in a multi-physics environment.
Kourosh Shoele	Florida State University	Nathan Greiner	Environment Informed Vibration Based Health Monitoring Technique

2018

Principal Investigator	Institution	PM Mentor	Title
Andrea L'Afflitto	University of Oklahoma	Phillip Root	A bio-inspired approach to fly undetected in cluttered environments
Chuanhua Duan	Boston University	Paul Sheehan	Replicating Neurotransmission Using 3D Nanofluidic Devices with Nanoparticle Blockage Enabled Voltage Gated Nanopore Arrays
Daniele Schiavazzi	University of Notre Dame	Peter Erbland	Unified Bayesian Networks for Uncertain Inputs and Partial Model Ensembles
Ehsan Elhamifar	Northeastern University	Jennifer Roberts	RAISS: Robust, Adaptive, Interactive and Scalable Summarization for Big Data
Elizabeth Sattely	Stanford University	Blake Bextine	Engineering a Plant Chassis for Rapid and Scalable Production of Small Molecule Therapeutics
Evgueni Filipov	University of Michigan	Ronald Polcawich	Functional Small Scale Actuation with Origami Inspired Assemblages
Haori Yang	Oregon State University	Mark Wrobel	Nanocrystalline Semiconductors for Radiation Detection
Heather Kulik	Massachusetts Institute of Technology	Anne Fischer	Adaptive-focus topological features for machine-learning-driven discovery of 2D coordination polymers
Hua Wang	Georgia Institute of Technology	Timothy Hancock	MAXIMA: Multi-Mode Hybrid Power Amplifier with EXtreme Instantaneous Bandwitdth and Recursive Scalable Marchand-Doherty Load ModulAtion Network
Hun-Seok Kim	University of Michigan	Neil Fox / Michael Fiddy	Hyper-Dimensional Modulation for Robust Low-Latency Low-Power IoT Networks
Hyung Bae	Howard University	Hava Siegelmann / Michael Fiddy	Polymer based replicated multi-modal fiber Bragg grating (FBG) for Fentanyl detection
Jeremy Munday	University of Maryland	Michael Fiddy	Engineering the Quantum Vacuum
Jonathan Klamkin	University of California, Santa Barbara	Gordon Keeler	Attojoule Sources for Photonic Integrated Circuits (ASPIC)
Juejun Hu	Massachusetts Institute of Technology	Gordon Keeler	Reconfigurable Energy-efficient Chip-scale Optical Network: Beyond the Classical Figure-of-merit (RECONFig)
Seth Caliga	SRI International	John Burke / Thomas Ehrenreich	Integrated Magnetic BEC Formation and Loading of an Optical Waveguide Trap for Atomic Inertial Sensing
Kaushik Sengupta	Princeton University	Timothy Hancock	Generalized Assymetrical Multi-port mm-Wave Power Amplifier Architecture for Simultaneous Frequency and Back-off Re-configurability
Mac Schwager	Stanford University	Paul Zablocky	Decentralized Tactical Modular Teaming for Real-World UAS Networks
Markita Landry	University of California, Berkeley	Alfred Emondi	Brain Chemical Signaling: A New Input Signal for Brain-Computer Interfaces

Principal Investigator	Institution	PM Mentor	Title
Mayar Eftekhar	Arizona State University	Fotis Barlos	Horizontal Coordination in Disaster Relief Operations: Incentives and Mechanisms
Mercedeh Khajavikhan	University of Central Florida	Joseph Altepeter	Topological Phenomena in Active Photonic Platforms
Michael Bartlett	Iowa State University / VTECH	Vishnu Sundaresan	Rapid, High Force Actuators through Mechanically 'Invisible' Heat Sinks
Michalis Polychronakis	Stony Brook University	Jacob Torrey	Compiler-assisted Software Specialization against Vulnerability Exploitation
Nathalie de Leon	Princeton University	Gordon Keeler	Nanophotonics for Telecom Quantum Networks Based on Neutral Silicon Vacancy Centers in Diamond
Neil Dasgupta	University of Michigan	Lori Adornato	Rational Design of Hierarchically-Structured Anti-Fouling Surfaces
Neville Sanjana	New York University	Anne Cheever	Genome-wide CRISPR Approaches for High-efficiency Homologous Recombination
Oscar Vazquez Mena	University of California, San Diego	Gopal Sarma	Acoustic Metamaterial for Ultrasound Transmission at 10 MHz Through the Skull for High Resolution Neural Modulation and Brain Imaging
Paul Hamilton	University of California, Los Angeles	John Burke	Increasing Spacetime Area Enclosed in Compact, High Quality Trapped Matter Wave Interferometers
Rui Bo	Missouri University of Science and Technology	Phillip Root	Agent-based Anti-gaming Platform for Wholesale Electricity Market Monitoring and Rule Design Using Big Data Analytics and Computational Intelligence
Subith Vasu	University of Central Florida	Michael Fiddy	TASER-FENTADET: Terahertz Handheld Detector Array Using Reflectance SpEctroscopy for Remote FENTAnyl DETection
Sze Zheng Yong	Arizona State University	Timothy Chung	Identification and Estimation of Swarm Intent via Partitions of System Dynamics
Tom Goldstein	University of Maryland	Jennifer Roberts	Self-assessing network models for big data summarization
Umit Orgas	Arizona State University	Jeff Maas	RETICLE: Energy Harvesting IoT Devices for Situational Awareness
Victor Brar	University of Wisconsin, Madison	Michael Fiddy	Probing the Limits and Implications of Ultra-high Electric Field Concentrations in Graphene Plasmonic Resonators
Vinod Valikuntanathan	Massachusetts Institute of Technology	Hava Siegelmann / Joshua Baron	Adversarial Machine Learning through the Cryptographic Lens
William Wang	University of California, Santa Barbara	Boyan Onyshkevych	Dynamo: Dynamic Multichannel Modeling of Misinformation

2017

Principal Investigator	Institution	PM Mentor	Title
Maren Vitousek	Cornell University	Adam Russell	Uncovering the mechanistic links between stressor exposure, the social environment, and future performance
James Watson	Oregon State University	Adam Russell	Comparing Micro-Macro Dynamics and Control Across Social-like Systems Using Equation Free Modeling
Liang Guo	The Ohio State University	Al Emondi	Implantable, Programmable Integrated Cellular Circuits
Andrew Nuss	University of Nevada, Reno	Anne Cheever	Development of strategies to target key mosquito host-seeking factors governing human host preference
Shelley Claridge	Purdue University	Anne Fischer	Translating Molecular Assembly in the Cell Membrane to nanoscopic Graphene Devices
David Cook	Kansas State University	Blake Bextine	Transcriptome engineering for enhanced agronomic defense, response and performance
Mykel Kochenderfer	Stanford University	Hava Siegelmann	Modular Representations and Coordination for Lifelong Learning
Mohit Bansal	The University of North Carolina at Chapel Hill	Hava Siegelmann	Dynamically Revising Neural Networks via Commonsense and Conversational Feedback
Mark Fuge	University of Maryland	Jan Vandenbrande	Topology and Synthesis of Design Manifolds
Stefanie Jegelka	Massachusetts Institute of Technology	MAJ Charlton Lewis	The Promise of Diversity: Geometry, Probability, Optimization and Machine Learning
Amir Ali Ahmadi	Princeton University	MAJ Charlton Lewis	Exploiting Geometry in the Design of Scalable Algebraic Relaxations for Nonconvex Polynomial Optimization
Lizhen Lin	University of Notre Dame	MAJ Charlton Lewis	Topological, Geometric and Statistical Foundations of Dynamic networks
Paul Bogadan	University of Southern California	MAJ Charlton Lewis	Data Driven Modeling Inference and Control of Complex Time Varying Networks A Statistical Physics Approach
Howard (Ho Wai) Lee	Baylor University	Michael Fiddy	Ultrafast nonlinear epsilon-near-zero optics in active conducting oxide metasurfaces
Zubin Jacob	Purdue University	Michael Fiddy	Reasonance Energy Transfer Model of No-Harmonic Light
Zongfu Yu	University of Wisconsin, Madison	Michael Fiddy	Physics-guided Machine Learning for the Inverse Design of Metasurfaces
Alexander Green	Arizona State University	Paul Sheehan	Artificial Ribosomes for Fully Programmable Synthesis of Nonribosomal Peptides
Yaniv Erlich	Columbia University in the City of New York	Renee Wegrzyn	Resistant and scalable storage using semi-synthetic DNA

Principal Investigator	Institution	PM Mentor	Title
Cong Trinh	The University of Tennessee	Renee Wegrzyn	ViPaRe (Virulent Pathogen Resistance): A highly adaptable defense system against virulent pathogens
Anushree Chatterjee	University of Colorado Boulder	Renee Wegrzyn	Developing Sequence blocking adaptable therapeutic strategy for Pathogen targeting
Michael Smanski	University of Minnesota	Renee Wegrzyn	Engineering reproductive barriers to accelerate niche differentiation
Ilija Zeljkovic	Boston College	Rosa Lukaszew	3D Printing of Novel High-Temperature Superconductors
Vladimir Manucharyan	University of Maryland	Rosa Lukaszew	Multi-Terminal Semiconductor/Superconductor Hybrid Josephson Junctions
Kurt Rohloff	New Jersey Institute of Technology	Thomas Rondeau	MARSHAL: Modular Adaptive Reuse of Secure and High-performance Advanced Libraries
Kaushik Chowdhury	Northeastern University	Thomas Rondeau	RAIDER: Reconfigurable and Application
Jeffrey Nanzer	Michigan State University	Timothy Hancock	Open-Loop Coherent Distributed Arrays
Arun Natarajan	Oregon State University	Timothy Hancock	Collaborative mm-Wave Beamforming Relays with Self-Interference Cancellation for Simultaneous Transmission and Reception
Zico Kolter	Carnegie Mellon University	Trung Tran	Learning optimization: optimization in the loop in deep learning models

2016

Principal Investigator	Institution	PM Mentor	Title
Sumeet Kumar Gupta	Pennsylvania State University / (Sub) Purdue	Kerry Bernstein	Ultra-Low Power Non-Volatile Processors Enabled by Ferroelectric Transistors
Hanna Cho	Ohio State University	Ronald Polcawich	Tailoring structural nonlinearity to manipulate mechanical resonances
James Manimala	Oklahoma State University	Ronald Polcawich	Metamaterials-Inspired Nonlinear and Inertant MEMS Devices
Jennifer Kitchen	Arizona State University	Timothy Hancock	Hybrid Silicon/GaN-Based Digital Transmitter Hardware for Realizing Wideband Transmitter-to-Antenna Interfaces
Jacob Adams	North Carolina State University	Troy Olson	Modeling and Characterization of Wideband Communications Via Narrowband Channels Using Direct Modulation
Jing (Jane) Li	University of Wisconsin - Madison	Linton Salmon	Liquid Silicon: A New Computing Paradigm Enabled by Monolithic 3D cross-point memory
Dae Hyun Kim	Washington State University	Linton Salmon	Design of High-Performance Multi-Tier Monolithic 3D Microarchitecture
Matthew Hirn	Michigan State University	Fariba Fahroo	Deep Wavelet Scattering for Quantum Many Body Physics
Imre (Risi) Kondor	University of Chicago	Fariba Fahroo	Multiresolution Machine Learning for Molecular Modeling
Suchi Saria	Johns Hopkins University	Hava Siegelmann	A Novel Modular Probabilistic Architecture for Individualized Reasoning
Amin Karbasi	Yale University	Hava Siegelmann	Efficient Learning of Human Intent from Observations
James Boedicker	University of Southern California	Jim Gimlett	Robustness of collective behavior in heterogeneous microbial networks
Xiang Cheng	University of Minnesota	Jim Gimlett	Studying the emergent collective flows of active fluids using engineered bacterial strains
Shu Jia	Stony Brook University, State University of New York	Michael Fiddy	Wavefront-Engineered, High-Speed Super-Resolution Microscopy for Nanometer-Scale, Live-Tissue Imaging
Fang Huang	Purdue University	Michael Fiddy	3D Super-resolution Imaging of Intact Animals
Alon A. Gorodetsky	University of California, Irvine	Jan Vandenbrande	Reconfigurable Cephalopod-Inspired Smart Materials for Soldier Health
Emilio Ferrara	University of Southern California Information Sciences Institute (USC ISI)	Adam Russell	Modeling Individual Trajectories and Incentives in Gamified Techno-social Environments
Casper Harteveld	Northeastern University	Adam Russell	Personalized and Crowdsourced Scenario Generation
Zhimin Xi	University of Michigan	Jan Vandenbrande	New Theory in Model-Based Design: A Design Foundation Driven by Probability of Design Errors

Principal Investigator	Institution	PM Mentor	Title
Samira Kiani	Arizona State University	Renee Wegrzyn	Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR)-based synthetic genetic circuits as next generation gene therapy of inner ear
Kathryn A. Whitehead	Carnegie Mellon University	Renee Wegrzyn	Next Generation mRNA Delivery Systems with Precise Spatial and Temporal Activity
Ahmad S. Khalil	Trustees of Boston University	Renee Wegrzyn	Advanced Genetic Control for Gene Therapy Using Synthetic Biology
T. Alex Perkins	University of Notre Dame	COL Matt Hepburn	Bridging Gaps Across Multiple Spatial Scales for Models of Mosquito-Borne Viral Disease Dynamics
Raina Plowright	Montana State University	COL Matt Hepburn	Modeling Pathways to Zoonotic Spillover
Nicholas G. Reich	University of Massachusetts, Amherst	COL Matt Hepburn	Optimal Infectious Disease Prediction with Multi-Scale Ensemble Models
Stephen Techtmann	Michigan Technological University	Justin Gallivan	Bilge Water Microbiomes as Biosignatures of Maritime Provenance
Rebecca Schulman	Johns Hopkins University	Paul Sheehan	Self-Targeting Biotic-Abiotic Interfaces

2015

Principal Investigator	Institution	PM Mentor	Title
Swaroop Ghosh	University of South Florida	Kerry Bernstein	Threshold-Defined Switches for Novel Logic Engines
Caleb Fulton	University of Oklahoma	Troy Olsson	A Multi-Tiered, Systematic Approach to Digital Array Interference Mitigation
Patrick Mercier	UCSD	Troy Olsson	A Dynamically Reconfigurable DC-RF Power Inverter Fully Integrated in CMOS
Srabanti Chowdhury	Arizona State University	Timothy Hancock	Ultimate high power vertical transistors for RF application using GaN and Diamond
Barry Rand	Princeton University	Troy Olsson	Compound Semiconductors for Transient Electronic and Optoelectronic Systems
Tengfei Luo	University of Notre Dame	Avram Bar-Cohen	Nanostructure Enabled Thermal Boundary Resistance Reduction across GaN-Substrate Interfaces
Kiersten Kerby-Patel	The University of Massachusetts, Boston	Dev Palmer	HIStrip: a Guided-Wave Framework for Low-Profile Antennas with High Impedance Ground Planes
Zhiru Zhang	Cornell University	Linton Salmon	Scale-Out Design Automation for Highly Productive Hardware Specialization
Janelle Ayres	The Salk Institute for Biological Studies	COL Matthew Hepburn, MD	Discovery of tolerance mechanisms: New therapeutics for infectious diseases
Amanda Jamieson	Brown University	COL Matthew Hepburn, MD	Influence of the lung microbiome on tolerance to pulmonary infections
Semiha Ergan	New York University Polytechnic School of Engineering	Justin Gallivan	Neuroscience for Architecture: Quantification of Human Responsiveness in Static and Responsive Built Environments
Xue Han	Boston University	Al Emondi	New Tools and Principles for Understanding the Biophysical Mechanisms of Ultrasound Neuromodulation
David Borton	Brown University	Al Emondi	Restoring balance and locomotion via model-driven sensory stimulation within dynamic and diverse environments
Stephen David	Oregon Health and Science University	Brad Ringeisen	Representation of natural sounds in the active auditory system
Stefanie Tellex	Brown University	Hava Siegelmann	Reducing Errors in Human-Robot Communication with Real-Time Feedback
Stephen R. Niezgoda	Ohio State University	John Main	Computational Design Tools for Qualifying Uncertainty Due to Material Variability
George Konidaris	Duke University	Hava Siegelmann	Bridging the Gap between Low-level Robot Control and Flexible High-level Task Planning
Amy LaViers	University of Illinois	Hava Siegelmann	Choreography of Embodied, Platform-invariant Motion Primitives
Xiaobo Yin	University of Colorado	Anne Fischer	Super-resolution Photoacoustic Wavefront Shaping (SuperPAWS)

Principal Investigator	Institution	PM Mentor	Title
Wei Xiong	UCSD	Anne Fischer	Heterodyned 2D SFG Spectromicroscopy-in situ visualization functionality origins at complex Nano-assembly interfaces
Thomas Faulkner	University of Illinois	Fariba Fahroo	Geometrization of strongly correlated phenomena via gauge-gravity duality: from fractional quantum Hall to quantum entanglement
Lek-Heng Lim	University of Chicago	Fariba Fahroo	Statistical Inference on Grassmannians
Javad Lavaei	UC Berkeley	Fariba Fahroo	New Theoretical Approaches to High-Dimensional Optimization
Nanfang Yu	Columbia University	Predrag Milojkovic	Metasurface-Based Spatial Light Modulators

2014

Principal Investigator	Institution	PM Mentor	Title
Panagiotis Artemiadis	Arizona State University	JC Lede	Optimizing human supervision of multi-agent systems
Spring Berman	Arizona State University	JC Lede	Specification and Control of Customizable Multi-Robot Systems for Distributed Sensing and Cooperative Manipulation
Emily Falk	University of Pennsylvania	Adam Russell	Neural mechanisms of influence, deterrence and message propagation
Necmiye Ozay	University of Michigan	Fariba Fahroo	Dynamics-based information extraction: a hybrid systems approach
Jarvis Haupt	University of Minnesota	Fariba Fahroo	Model-Based Matrix Completion: A Paradigm for Imputation, Fusion, and Inference from Multi-modal Data
Yang Jiao	Arizona State University	Michael Maher	Integrated Computational Scheme for the Characterization, Modeling and Prediction of Microstructure Evolution and Fatigue Response in Titanium Alloys
Michael Sangid	Purdue University	Fariba Fahroo	Predictive Materials Science and Fatigue Life Prognosis
Clair Sullivan / Shiva	University of Illinois	Mark Wrobel	A New Approach to Stand-off Detection of Special Nuclear Material using Big Data Analysis
Carlos Romero-Talamas	University of Maryland Baltimore County	Vincent Tang	Simulations of spheromak formation and sustainment from multi-pulse helicity injection
Mikhail Shapiro	California Institute of Technology	Fariba Fahroo	Selective Ultrasonic Bioswitches for Precise Local Modulation of Physiology
Amin Arbabian	Stanford University	Fariba Fahroo	Highly Miniaturized Deep-Tissue Wireless Implants with Acoustic Power and Data Links
Christopher Bettinger	Carnegie Mellon University	Daniel Wattendorf / Douglas Weber	Orthogonal Parameterization of Bioinspired Peripheral Nerve Interface Materials
Andrea Tao	University of California, San Diego	Prem Kumar	Plasmonic Nanoprobes for Neuronal Monitoring
Rajesh Rao Nadakuditi	University of Michigan	Fariba Fahroo	Topological methods for uncovering hidden structure in neural activity and connectivity
Ovijit Chaudhuri	Stanford Unviersity	Tyler McQuade	Hierarchically Structured Hybrid Biopolymer Hydrogels for Treatment of Traumatic Injuries on the Battlefield and to Promote Long-Term Tissue Regeneration
Aaron Esser-Kahn	University of California, Irvine	Tyler McQuade	Morphogenetic systems for adaption in complex materials
Tak-Sing Wong	Pennsylvania State University	Douglas Weber	Mind-Controllable Interfacial Materials
Vivienne Sze	Massachusetts Institute of Technology	Joseph Cross	Energy-Efficient Embedded Vision Systems

Principal Investigator	Institution	PM Mentor	Title
David Wentzlaff	Princeton University	Joseph Cross	Looking Beyond the Dark, Rethinking General Purpose Computer Architecture for UAV and Space Processing
Jessica Ruyle	University of Oklahoma	Dev Palmer	Placement Insensitive Antennas Approaching Two-Dimensionality for Conformal Multi-Platform Use
John Albrecht	Michigan State University	Avram Bar-Cohen	Modeling Phonon Generation and Transport in the Near Junction Region of Wide Band Gap (WBG) Transistors
Satish Kumar	Georgia Tech Research Corporation	Avram Bar-Cohen	Electron-Phonon Transport in High-electron Mobility Transistors including Electromagnetic Effects
Jacob Robinson	Rice Univesity	Justin Gallivan	Electrophysiology-Assisted Cell Sorting (E-phACS) for High-throughput Synthetic Neurobiology
Pamela Peralta-Yahya	Georgia Tech Research Corporation	Justin Gallivan	Chip-based yeast engineering for the production of chemicals
Songbin Gong	University of Illinois	Kerry Bernstein	Parametrically Excited Resonant Computing systems (PERCs)
Becky Peterson	University of Michigan	Fariba Fahroo	Amorphous Oxide Thin Film Transistors for Switched-Mode Power Supplies
Thomas Serre	Brown University	Fariba Fahroo	Scaling up computational models of visual processing in cortex
Mike Shuo-Wei Chen	University of Southern California	Daniel Hammerstrom	Dual-Channel UWB Impulse-Based interconnect towards Large Scale Plastic Neural Network
Vladimir Itskov	Pennsylvania State University	Pre Kumar	Topological Methods for Uncovering Hidden Structure in Neural Activity and Connectivity in the Brain

2013

Principal Investigator	Institution	PM Mentor	Title
Eric Brustad	The University of North Carolina at Chapel Hill	Justin Gallivan	Expanding Enzyme Catalysis Through Non-natural Amino Acids and Cofactors
Cullen Buie	Massachusetts Institute of Technology	Justin Gallivan	Enabling Novel Chassis for Synthetic Biology
Bradley Bundy	Brigham Young University	Justin Gallivan	A Cell-free Synthetic Biology Approach to Expand the Language of Biology
Fuzhong Zhang	Washington University in St. Louis	Justin Gallivan	Biosynthesis of Non-Natural Fatty Acids for the Production of Chemicals and Advanced Biofuels
Sheng Shen	Carnegie Mellon University	Avram Bar-Cohen/ Joe Cross	Compliant and Thermally Conductive Ordered Nanostructures for Next Generation Thermal Interface Materials
Mustafa Akbulut	Texas A&M Engineering Experiment Station	Avram Bar-Cohen/ Joe Cross	Next-Generation Solders Involving Dispersion of Soft Ligand Functionalized Boron Nitride Nanoribbons or Nanosheets in Alloys as Thermal Interface Materials (TIMs)
Konstantin Zeldovich	University of Massachusetts Medical School	Jim Gimlett	Robust Analysis and Prediction of Influenza Reassortment (RAPIeR)
Hai (Helen) Li	University of Pittsburgh	Dan Hammerstrom	An Adaptive Information Processing System Resilient to Device Variations and Noises
Omer Oralkan	North Carolina State University	Lt.Col. Daniel Wattendorf	An Ultrasound-Based Noninvasive Neural Interface to the Retina
Elliot Hui	The Regents of the University of California, Irvine	Lt.Col. Daniel Wattendorf	Directed Evolution of Phytochrome Absorption Spectra for Multichannel Optogenetic Cellular Interfaces
Polina Anikeeva	Massachusetts Institute of Technology	Lt.Col. Daniel Wattendorf	Nanoparticle-Enabled Sensitivity of Specific Neurons to Alternating Magnetic Fields for Targeted Transcranial Magnetic Stimulation
Pieter Abbeel	The Regents of the University of California	Gill Pratt	Supervised Autonomy for Robotic Manipulation
Andrea Thomaz	Georgia Tech Research Corporation	Gill Pratt	Object-Level Communication for Human-Robot Motion Generation
Edwin Olson	The Regents of the University of Michigan	Gill Pratt	Mutual Modeling for Human/Robot Teaming with Minimal Communications"
Sangbae Kim	Massachusetts Institute of Technology	Gill Pratt	A Disaster Response Robot Capable of Power Manipulation
Walter Voit	The University of Texas at Dallas	Douglas Weber	Smart Polymer Devices for Chronic Multifascicular Microstimulation
Nuh Gedik	Massachusetts Institute of Technology	Prem Kumar	Time, Energy and Momentum Resolved Probing of Ultrafast Dynamics in Quantum Materials
Chris Marianetti	The Trustees of Columbia University in the City of New York	Jim Gimlett	MicNovel functionality in Oxides via Jahn-Teller Ions: a DFT+DMFT Study

Principal Investigator	Institution	PM Mentor	Title
Gregory Fiete	University of Texas at Austin	Jim Gimlett	Establishing Design Principles for Strongly Correlated Quantum Materials
Jonathan Simon	The University of Chicago	Prem Kumar	Photons in Gauge Fields: Spin-Hall Effect to Strong Correlations
Zhaowei Liu	University of California San Diego	Joshua Conway	High-speed Nanophotonic LEDs at 100GHz and Beyond
Daniel Feezell	Regents of the University of New Mexico	Joshua Conway	High-Speed Nonpolar InGaN/GaN Light-Emitting Diodes Using Plasmonic Core-Shell Nanowires
Aaron Dollar	Yale University	Michael Maher	Rapid Field Fabrication by Non-Experts
Jesse Rissman	The Regents of the University of California, Los Angeles	Douglas Weber	Giving Classic Learning Principles a Virtual Makeover: Neural Correlates of Effective Retrieval of Memories Formed in a Virtual World
Jonathan Hauenstein	University of Notre Dame	Reza Ghanadan	Numerical Algebraic Geometric Methods for Data Analysis

2012

Principal Investigator	Institution	PM Mentor	Title
Dirk Englund	Massachusetts Institute of Technology	Prem Kumar	Chip-Integrated Timing and Inertial Measurement Using Electron Spins in Diamond
Harmut Haeffner	University of California, Berkeley	Prem Kumar	Interfacing Trapped Ions With a Tank Circuit for Hybrid Quantum Devices
Benjamin Lev	Stanford University	Prem Kumar	Quantum Brazovskii Physics via Fully Emergent and Compliant Optical Lattices
Holger Muller	University of California, Berkeley	Prem Kumar	Cavity-based Atomic Rotation and Acceleration Sensor
Michelle Chang	University of California, Berkeley	Justin Gallivan	Synthetic Biology Approaches to Cellular Nanomaterials
Harvinder Singh Gill	Texas Tech University	Justin Gallivan	Pollen Grains as Novel Vaccine-Transporters for Oral Vaccination
Julius Lucks	Cornell University	Justin Gallivan	A Platform for Design and Global Characterization of Light-modulated RNA Networks
Georg Seelig	University of Washington	Dan Wattendorf	Nucleic Acid Circuitry for Point-of-Care Biomarker Detection and Analysis
Heather Clark	Northeastern University	Justin Gallivan	Lighting up the Chemistry of the Brain: Nanosciences Monitor Neurotransmitter Release
Michael McAlpine	Princeton University	Dan Wattendorf	Piezoelectric Nanoribbons for Interfaced Cellular Nanomechanics
Ryan Adams	Harvard University	Reza Ghanadan	Developing New Methods of Multi-Core Statistical Interference Towards Rapid Data Fusion and Information Extraction
Maria Cameron	University of Maryland	Reza Ghanadan	Methods for the Study of Rare Events
John Gunnar Carlsson	University of Minnesota	Reza Ghanadan	Strategically Allocating Resources in a Geographic Environment
Matthew Kahle	Ohio State University	Reza Ghanadan	Topology and Geometry of Random Simplicial Complexes
Mark Tygert	New York University	Reza Ghanadan	Computer-enabled Metrics of Statistical Significance
Abhay Pasupathy Narayan	Columbia University	Prem Kumar	The Two-Dimensional Limit of Strongly-Correlated Materials
James M. Rondinelli	Drexel University	Prem Kumar	Seizing the Third Dimension in Correlated Oxide Thin Films
Jaafar A. El-Awady	Johns Hopkins University	Tyler McQuade	Micro-Mechanics Modeling of Surface Roughness Evolution
Naomi S. Ginsberg	University of California	Tyler McQuade	Beneath the Bulk: Domain-Specific Efficiency and Degradation in Organic Photovoltaic Thin Films
Randall Goldsmith	University of Wisconsin - Madison	Tyler McQuade	Establishing Rules for Thin Film Organic Electronic Devices
Bryan W. Boudouris	Purdue University	Michael Maher	Radical Polymers for Nanostructured, Next Generation Thermoelectric Devices
Andrea M. Hodge	University of Southern California	Michael Maher	Highly Nanotwinned Ultra High Strength Aluminum Alloys

Principal Investigator	Institution	PM Mentor	Title
Gap-Yong Kim	Iowa State University	Judah Goldwasser	Manufacturing of High-strength, Lightweight Magnesium Panels with Hierarchical Structures
Krishnan S. Raja	University of Idaho	Judah Goldwasser	Design and Synthesis of Ceramic Molecular Auxetic Materials
James Henderson	Syracuse University	Michael Maher	Shape-Memory-Actuated Materials for Accelerated Healing of Orthopedic Injuries in Warfighters
Aydin Babakhani	Rice University	Dan Purdy	A sub-THz CMOS On-chip Antenna with an Integrated Oscillator
Muhannad Bakir	Georgia Institute of Technology	Bill Chappell	Radical Interconnect Technologies for 3D Heterogeneous System Integration
Christopher Batten	Cornell University	Bill Chappell	Complexity-Effective Vector Specialization for Image and Video Processing
Prem Chahal	Michigan State University	Bill Chappell	Heterogeneous Integration of Nanodevices for THz Circuit Applications
Hyoung Koo Lee	Missouri University of Science & Technology	Bill Chappell	Flat-Panel X-ray Sources
Qiangfei Xia	University of Massachusetts Amherst	Bill Chappell	3D All-silicon-based Resistive Random Access Memory
Robert Deegan	University of Michigan	Avi Bar-Cohen	A Microfluidic Platform Actuated with Light
Neal Hall	University of Texas, Austin	Avi Bar-Cohen	Ultra-small, Ultra-low-noise, Broadband Acoustic Sensors
Pramod Reddy	University of Michigan	Avi Bar-Cohen	Nanoscale Engineering of Interfacial Thermal Transport in HEMTs for Improved Reliability
Evan Reed	Stanford University	Avi Bar-Cohen	NEMS with 2D engineered piezoelectric materials
Matteo Rinaldi	Northeastern University	Avi Bar-Cohen	Un-cooled Nanomechanical Infrared/THz Detectors Based on Piezoelectric Resonant Nano Plates
Mikhail Belkin	University of Texas, Austin	Richard Heinrichs	Room-Temperature High-Power Terahertz Semiconductor Laser Sources
Amy Foster	Johns Hopkins University	Richard Heinrichs	Three-dimensional Integration of CMOS-compatible Nonlinear Photonic Circuits
Chris Giebink	Pennsylvania State University	Richard Heinrichs	Organic Photonics: Enabling Complex Index Modulation for Optical Isolation and Switching in Next-generation Plastic Fiber Networks
Wei Jiang	Rutgers, The State University of New Jersey	Richard Heinrichs	High Speed Spatial Light Modulator (SLM) with Flexible Inter-pixel Processing
Jongseung Yoon	University of Southern California	Richard Heinrichs	Conformal, Flexible Assemblies of Ultrathin, Microscale VCSEL Arrays Towards Wearable and Implantable Integrated Optical Diagnostic and Therapeutic Platform
Wojciech Matusik	Massachusetts Institute of Technology	Reza Ghanadan	High-fidelity Mapping From Specification to Fabrication

Principal Investigator	Institution	PM Mentor	Title
Alaa Ahmed	University of Colorado		Influence of Threat on Decision Making under Risk: A Neuroeconomic Approach to Movement Control
William Killgore	Harvard Medical School		Multimodal Neuroimaging to Predict Cognitive Resilience Against Sleep Loss
Chet T. Moritz	University of Washington	Justin Sanchez	A Brain-Machine-Spinal Interface BMSI to Replace and Repair the Injured Nervous System
Dario Pompili	Rutgers, The State University of New Jersey		Towards Real-time Vital Sign Data Processing in Mobile Computing Grids for Advanced Operational Neuroscience
Matthew Lease	University of Texas, Austin	Rand Waltzman	Blending Crowdsourcing with Automation for Fast, Cheap, & Accurate Analysis of Spontaneous Speech
William Rand	University of Maryland	Rand Waltzman	Intelligent Interfaces for Social Media: Monitoring, Modeling and Engaging in Online Conversations
Daniel Goldman	Georgia Institute of Technology	Gil Pratt	Towards a Terramechanics of Heterogeneous Granular Media
Hadas Kress-Gazit	Cornell University	Gil Pratt	Autonomous robots: Explaining failures and boosting success of high-level tasks
Carmel Majidi	Carnegie Mellon University	Gil Pratt	Soft Machines and Electronics for Bio-inspired Robots and Wearable Assistive Technologies

2011

Principal Investigator	Institution	Title
Anastassia Alexandrova	UCLA	The Inside-Out Design of Artificial Metallo-Enzymes with Unprecedented Specificity and Reactivity
Dimitris Anagnostou	SD School of Mines & Technology	Basic Research on Autonomous and Multi-Reconfigurable Antenna Arrays
Joseph Bardin	University of Massachusetts	Programmable Front-Ends in Advanced Technologies
Xing Cheng	Texas A&M	Surface-Phonon-Polariton-Enhanced Infrared Antennas for Exceptionally Sensitive Chemical Detection
Dino Di Carlo	UCLA	High-Throughput Mechanical Characterization of Cell State and Function
Brian Floyd	North Carolina State University	Interferometric Imaging Using Reconfigured Millimeter-Wave Phased Arrays in Silicon (IIRIS)
Mark Foster	Johns Hopkins University	SWiPhT: Scalable Ultra-High-BandWidth Photonic Transmultiplexer
Mahmoud Hussein	University Of Colorado	Vibration Isolation via Directional Subwavelength Dissipation
Michael Jewett	Northwestern University	Synthesis of Sequence-Defined Vinyl Polypeptides for Functional Biohybrid Materials
Hanseup Kim	University of Utah	Infinite-Loop Micro Circulatory Gas Chromatograph (MCCG)
Rafal Komendarczyk	Tulane	Topological Invariants of Fluid Flows
Rouslan Krechetnikov	UCSB	Low-Dimensional Modeling and Identification of Finite-Amplitude Instabilities in Complex Systems
Harish Krishnaswamy	Columbia University	Active Waveguides on Silicon for Sub-mmWave/Terahertz Electronics
Minjoo Larry Lee	Yale University	InGaAs Quantum Dots on GaP/Si: A New Platform for Si-Based Light Emitters
Sang-Hyun Oh	University of Minnesota	Stretchable Plasmonic Devices with Sub-1-nm Critical Dimensions
Christine Payne	Georgia Tech	Intracellular Synthesis of Conducting Polymer Nanowires for Electrical Stimulation and Sensing
Balakanapathy Rajaratnam	Leland Stanford Junior University	Rigorous Mathematical Foundations for Network Analysis
Mark Riedl	Georgia Tech	Automated Narrative Reasoning for Training Adaptive Leaders and Warfighters
Robert Rioux	Penn State	Lignin Depolymerization by Surface Organocatalysts in Ionic Liquids
Raymond Rumpf	University of Texas, El Paso	Direct Digital Manufacturing of 3D Metamaterial Devices
Vito Scarola	Virginia Polutechnic Institute & State University	Emulating Strongly Interacting Quantum Matter with Optical Lattices
Thomas Schibli	University Of Colorado	Monolithic Ultrafast Solid-State Lasers
David Schuster	University of Chicago	Quantum Memories and Ultrasensitive Spin Detection Using Superconducting Circuits
Sanjiv Sinha	University of Illinois	A Circuit-Level Directional Heat Spreader for Short Time Scale Transients
Rifat Sipahi	Northeastern University	Model-Free Algorithms to Assist and Control Human-Task Missions against Dynamic Environments
Nathan Sniadecki	University of Washington	A BIOMEMS Platform for Coagulation Testing

Principal Investigator	Institution	Title
Mark Styczynski	Georgia Tech	Identifying Allosteric Metabolite-Protein Interactions for Engineering Therapeutics
Zeeshan Syed	University Of Michigan	Computational Neuromarkers
Yayoi Takamura	University of California, Davis	Interface Controlled Functionality in Perovskite Oxide Superlattices
Hakan Tureci	Princeton	Engineering Complex Photonic Media for High-Performance Compact Coherent Light Sources
Edo Waks	University of Maryland	Ultra-Fast Quantum Information Processing Using Quantum Dot Spin Coupled to Photonic Crystals
Xudong Wang	University of Wisconsin System	Piezoelectric ZnO Nanomembranes for Flexible Nanogenerators
Kristina Winbladh	University of Delaware	iMuse: Interactive Model-Based Use-Case and Storytelling Environment
Xiaodong Xu	University of Washington	Dynamically Tunable Mid-Infrared Quantum Optoelectronics Based on Bilayer Graphene
Jie Xu	Washington State University	Ear on a Chip: Microfluidics for Characterization and Control of Hair-Cell Sensing with Acoustic Stimuli
Bin Yang	Washington State University	Jet Fuel Production from Biomass-Derived Lignin in Remote Locations
Peng Yin	Harvard	Programmable Inorganic Materials Synthesis with DNA Nano-Structures
Xiao-Dong Zhou	South Carolina	High Power and Long Life SOFC Systems Powered by JP-8
Olesya Zhupanska	University of Iowa	Investigation of Multi-Field Interactions in Composites: Towards Achieving Multi-Functionality

2010

Principal Investigator	Institution	Title
Andrew Houck	Princeton University	Scanned Probe Cavity Quantum Electrodynamics
Brian D'Usro	University of Pittsburgh	Quantum Interactions of a Graphene Nanomechanical Oscillator with a Single Spin
Chuanwei Zhang	Washington State University at Pullman	Induced Topological Order and Quantum Computation in Fermionic Cold Atom Superfluids
Martin Zwierlein	Massachusetts Institute of Technology	Strongly Interacting Fermi Gases in Lower Dimensions
Thomas Knotts	Brigham Young University	Predicting Protein Behavior on Surfaces for Improved Design of Protein Arrays
Emily Gibson	University of Colorado, Denver	Integration of Microfluidic Devices with Nonlinear Spectroscopy for Flow Cytometry and Bioagent Detection
Howard Salis	Pennsylvania State University	Rational Design of Nucleic Acid Drugs to Control Metabolism and Kill Pathogens
Andrew Blumberg	University of Texas at Austin	Applied algebraic topology: Categorical foundations, topological statistics, and practical implementations
Jason Morton	Pennsylvania State University	Kernel Counting
Youping Chen	University of Florida	Predicting Materials Properties from their Microstructural Architecture
Yashashree Kulkarni	University of Houston	Computational Modeling of Grain Stability in Nanostructured Materials
Aaron Lindenberg	Stanford University	All-optical control of nanoelectronic devices
Gregory Engel	University of Chicago	Coherent Energy Transfer in Novel Excitonic Materials for High Speed Large Area Sensors and Efficient On-Pixel Data Processing
Artem Oganov	Stony Brook University	Novel computational methodologies for nananoscale design of functional materials
Yu Huang	University of California, Los Angeles	Design of Broad Spectrum Solar Energy Harvesting Antenna for Organic Photovoltaics
Yongsheng Chen	Pennsylvania State University	Catalyst Deactivation in Steam Reforming of Liquid Hydrocarbons to Produce Hydrogen for Fuel Cell Power Generation
Krishna Mandal	University of South Carolina	Quantum Cutting Core-Shell Nanocrystals for Enhanced Solar Cell Efficiency
Mona Jarrahi	University of Michigan	Plasmonics-Enabled Ultra-Short Carrier Lifetime Photoconductors for High Power Terahertz Generation
Alyosha Molnar	Cornell University	Bio-inspired optical image compression in CMOS
N. Peter Armitage	Johns Hopkins University	Invention, Development, and Application of a Time domain THz Ellipsometer
Xiaojing (John) Zhang	University of Texas at Austin	Patterned Plasmonic Surfaces on MEMS
Dana Weinstein	Massachusetts Institute of Technology	Mutli-GHz Acoustic Resonance in Transistors
Chuan-Hua Chen	Duke University	A Planar Thermal Diode
Kripa Varanasi	Massachusetts Institute of Technology	Looking Around Corners using Transient Imaging
Lin Zhu	Clemson University	On-chip coherent combining of angled-grating-confined broad-area semiconductor lasers

Principal Investigator	Institution	Title
Ramesh Raskar	Massachusetts Institute of Technology	Looking Around Corners using Transient Imaging
Ozdal Boyraz	University of California, Irvine	Nitride Semiconductor Single-Photon Emitters and Photon Entanglement
Pei-Cheng Ku	University of Michigan	Nitride Semiconductor Single-Photon Emitters and Photon Entanglement
Manuel Gamero-Castano	University of California, Irvine	Nanodroplet Beam Sputtering for Very Fast Milling and Micromachining of Inert Materials
John Johnson	Kent State University	Targeting Stress Resilience Without Detriment to Adaptive Stress Response
William Tyler	Arizona State University	The Development of Pulsed Ultrasound for Noninvasive Neural Interfaces
James Caverlee	Texas Engineering Experiment Station / Texas A&M University System	Personalized Monitoring of the Real-Time Social Web
Abel Rodriguez	University of California, Santa Cruz	Dynamic Social Modeling: Estimation and Optimal Intervention Design

2009

Principal Investigator	Institution	Title
Scott Aaronson	Massachusetts Institute of Technology	Basic Unresolved Questions about the Capabilities of Quantum Computers
David Arnold	University of Florida	Microelectromechanical Inductors for Switch-Mode Power Converters
Alan Aspuru-Guzik	Harvard University	Practical Quantum Simulators
Debra Auguste	Harvard University	Colloid Morphogenesis
Jonathan Boyd	West Virginia University	Natural Designs for Network Threats
Jennifer Cha	University of California, San Diego	Manufacturable Approaches for Nanometer Resolution Patterning
Adam Cohen	Harvard University	Molecular spintronics: nanomagnetic control of electronic spins
Baratunde Cola	Georgia Institute of Technology	Photothermal Enhanced Carbon Nanotube Rectenna Arrays for Solar Energy Conversion
Mary Comer	Purdue University	Automated Segmentation of Micrographs
Christopher Dames	University of California, Riverside	Ballistic-Elastic Thermal Rectification in Asymmetric Nanostructures
Kevin Dorfman	University of Minnesota	Nanopost Array for DNA Fingerprinting
Julia Greer	California Institute of Technology	Bio-Inspired Design of Damage-Tolerant Materials
Jack Harris	Yale University	Quantum Optomechanics
Todd Hastings	University of Kentucky	Nanoscale ElectronBeam Induced Processing using Liquid Reactants
Amy Herr	University of California, Berkeley	An Integrated Micro/Nanosystem for Rapid Validation of Traumatic Brain Injury (TBI) Biomarkers
R. Jason Jones	University of Arizona	Two-Color Phase Coherent High Power Laser System for Efficient Generation of Light at Extreme Wavelengths
Wendy Kelly	Georgia Institute of Technology	Biosynthetic engineering of thiopeptide antibiotics
Xiuling Li	University of Illinois	III-V Nanowire Fin FET on Silicon: A Bottom-up CMOS Compatible Approach
Jennifer Lu	University of California Merced	3D Electromechanical System: Nanoscale Power Generator
William Oates	Florida State University	Field-coupled Mechanics and Nonlinear Control of Photo responsive Adaptive Structures
Stanley Pau	University of Arizona	Microchip Ion Trap
Scott Phillips	Pennsylvania State University	Autonomous Materials
Kevin Pipe	University of Michigan	Heat Sinks for Ballistic Phonons
Stefan Preble	Rochester Institute of Technology	Silicon Nanocrystal 100 Gb/s Electro-Optic Modulator
Beth Pruitt	Stanford University	MEMS-Based Water Quality Detection
Irfan Siddiqi	University of California, Berkeley	Superconducting Nanobridge Junctions for Quantum Information Processing
Jake Soper	Georgia Institute of Technology	Redox-Active Ligand-Mediated RadicalCoupling at Terminal Metal Oxo Ligands: Reactions Relevant to Water Oxidation for Artificial Photosynthesis
Russell Tedrake	Massachusetts Institute of Technology	Learning Supermaneuverable Flight

Principal Investigator	Institution	Title
Samuel Thomas	Tufts University	Sensing with Chemically-Directed Electrostatic Self-Assembly
Doris Tsao	California Institute of Technology	Brain Mechanisms for Navigation in Primates
Douglas Weibel	University of Wisconsin	Engineering Emergent Behavior in Microbial Communities
David Wentzloff	University of Michigan	3D Wireless Interconnect for Crossbar Routing in Many-Core Processors
Jonathan Wisor	Washington State University	Local sleep in the cerebral cortex: a tool for sustained operations

2008

No awardee class in 2008.

2007

Principal Investigator	Institution	Title
Abbas Abbasour-Tamijani	Arizona State University	Programmable Acoustic Filters Based on Silicon Microstructures
Ehsan Afshari	Cornell University	Optotronics: Optically Inspired Electronics
Richard Averitt	Boston University	Metamaterial Enhanced MEMS for Terahertz Technology
Seth Bank	University of Texas at Austin	Compact, High-Efficiency, MidInfrared Dilute-Nitride Diode Lasers
Sarah Bergbreiter	University of Maryland, College Park	Silicon/Elastomer Components for Autonomous Jumping Microrobots
Sunil Bhave	Cornell University	Silicon Opto-Acoustic Oscillator
Markus J. Buehler	MIT	Bio-Inspired Nano-Engineered Hierarchical Structures for Adaptive Thermal Management
J. Scott Bunch	University of Colorado, Boulder	Graphene Membrane
Sylvain Cloutier	University of Delaware	Low-Cost Chip-Integrated Small FormFactor Random Lasers for Advanced High-Speed Opto-Electronic Hybrid Circuits
Marija Drndic	University of Pennsylvania	Electrical Multiple Exciton Generation (MEG) Detection in Semiconductor Nanocrystals and the Development of Efficient and Tunable Single Nanocrystal Photodectors
A. John Hart	University of Michigan	Hybrid Nanostructure Arrays for Microand Nano-scale Energy Conversion and Storage
Hossein Hashemi	University of Southern California	Silicon-based Ultra Wideband Camera for Spatial and Spectral Awareness
Tsinghua Her	University of North Carolina, Charlotte	Gain-Guiding in Photonic Bandgap Fibers: A New Paltform for Ultra HighPower Lasers and Amplifiers
Carlos Hidrovo	University of Texas at Austin	High Speed Droplet Flows: Microscale Total Analysis and Thermal Management Systems Applications
Hongrui Jiang	University of Wisconsin, Madison	Super Artificial Eyes (SAE)
Igor Jovanovic	Purdue University	Direct Temporal Pulse Shaping Via Phase-Sensitive Three-Wave Mixing
Christine Luscombe	University of Washington	Nanostructures for Optimal Energy Harvesting
Michael Leuenberger	University of Central Florida	High-Temperature Electrially Driven Mbps Single-Photon Source at Telecom Wavelengths
Yifei Li	University of Massachusetts, Dartmouth	Integrated Photonic Frequency Mixer
Zhenqiang (Jack) Ma	University of Wisconsin, Madison	Toward 3D Si Photonics: DBR-Free VCSELs on Si Enabled with Manufacturable Nanomembrane Stacking
Kenn Oldham	University of Michigan	Energy Efficient Piezoelectric Servo Control for Micro-Robotics
Tomás Palacios	MIT	On-Wafer Integration of Nitride and Silicon CMOS Electronics
Harold Park	University of Colorado, Boulder	Novel Multiscale CAE Tools for Surface-Dominated NEMS
Sumita Pennathur	University of California, Santa Barbara	Portable, Efficient Electrokinetic Energy Generation using a Novel Graphene based Nanofluidic Device
Eric Pop	University of Illinois, Urbana-Champaign	Femto-Joule Atomic-Scale Reversible Switch
Farhan Rana	Cornell University	Terahertz Plasmon Oscillators: Lasers for Circuits
Ronald Reano	Ohio State University	All-Dielectric Doubly Resonant RF/Optical Degenerate Band-Edge Crystal Antenna

Principal Investigator	Institution	Title
David Ricketts	Carnegie Mellon University	Spin-torque Oscillators for Spectrumagile RF
Jay Sharping	University of California, Merced	Wideband Quantum Frequency Conversion in Optical Fibers: Enabling Transparent Quantum Information Processing
Wei Tan	University of Colorado, Boulder	Highly Selective, Stable and Manufacturable Nano-Bio-Sensor
Emanual Tutuc	University of Texas at Austin	Germanium Nanowire Gate All Around Tunneling Field Effect Transistors
Michael Vasilyev	University of Texas at Arlington	Coherent Nonlinear-Optical Image Processing in Plasmonic Metamaterial
Jelena Vuckovic	Stanford University	Ultrafast Optical Switches Controlled at a Single Photon Level
Michael B. Wakin	University of Michigan	Geometric Methods for Compressive Multi-Signal Processing
Chunlei Wang	Florida International University	Fabrication of Nano Fractal Electrodes for On-Chip Supercapacitor Application
Evelyn N. Wang	MIT	Tunable Nanostructured Arrays for Stable High-Flux Microchannel Heat Sinks
Benjamin Williams	University of California, Los Angeles	Nanowire Heterostructure Intersublevel Optoelectronics
Ronggui Yang	University of Colorado, Boulder	Surface-Plasmon Enabled High Efficiency Thermoelectric Devices
Xiaolin Zheng	Stanford University	Cell Motion-Based Toxin Detector Using Nanowires

2006

Principal Investigator	Institution	Title
Chee Wei Wong	Columbia University	Nonlinear signal processing in silicon photonic crystal nanocavities
Benton Calhoun	University of Virginia	Sub-threshold FPGAs for Ultra-Low-Power Applications
Robert Wood	Harvard College	At-Scale Insect Aerodynamics and Creation of Winged Robots
Hooman Mohseni	Northwestern University	Electrically Tunable Quantum Dots for Adaptive Infrared Imaging
Mark Johnson	NC State University	Demonstration of Epitaxial MOS for Nitride Semiconductors
Olgica Milenkovic	University of Colorado	Belief Propagation Algorithms for Compressed Biosensing
Marc Christensen	Southern Methodist University	Active Illumination for Adaptive Multi-resolution Sensing
Greg Walker	Vanderbilt University	Thermal Rectification Using Nanostructured Materials
Farinaz Koushanfar	Rice University	Symmetric Variability-Based Integrated Circuits Metering
Ville Kaajakari	Louisiana Tech	Porous silicon for MEMS vacuum packages
Jamie Phillips	University of Michigan	Oxide Electronics for Integrated Microsystems and Displays
Katherine Zhang	Boston University	Micro- and Nano- Mechanics of Thin Films and Coatings
James Buckwalter	University of California, San Diego	High-Voltage Soliton Circuits in Silicon Germanium
Hang Lu	Georgia Tech	Hybrid Biometric MEMS for Detecting Water Contamination
Gu-Yeon Wei	Harvard College	Switch-Mode Power-Supply Regulators for Chip Multiprocessors
Yoav Peles	Rensselaer Polytechnic Institute	Exploiting cavitation to power submerged microdevices
Thomas Murphy	University of Maryland	Linearized Electro-optic Phase Modulation
Kamran Mohseni	University of Colorado	Thermal Management with Digitized Heat Transfer
Dennis Akos	University of Colorado	Software Based Detection System for Satellite Navigation
Xinming Huang	Worcester Polytechnic Institute	Dynamically Reconfigurable Microsystems
David Brooks	Harvard College	µWatt Computing - Architectures for Wireless Sensors
Manal Omary	Texas Woman's University	Phosphorescent PLEDs
Hod Lipson	Cornell University	3D Digital Printer for Desktop Microfabrication
David Erickson	Cornell University	Integrated Nanosystem for Autonomous Health Monitoring