QUANTUM SCIENCE CENTER

QUANTUM

SUMMER SCHOOL

04.21.25 – 04.25.25

PURDUE UNIVERSITY | Purdue Quantum Science and Engineering Institute

2025 QSC SUMMER SCHOOL AGENDA

Hall of Discovery Learning and Research, Purdue University, West Lafayette campus

MONDAY, APRIL 21, 2025	
1:00 p.m. – 5:30 p.m.	Pre–conference chalk talks led by experienced graduate students and postdocs are an informal introduction to the broad topics of research covered by the QSC. These talks provide additional context or introduction to topics explored in more detail throughout the conference.
	• Quantum Materials for QSC – **Olivia Liebman**, *UCLA*
	• Quantum Devices for QSC I – **Ryan Linehan**, *Fermi National Accelerator Laboratory*
	• Quantum Devices for QSC II – **Alaina Attanasio**, *Purdue University*
	• Quantum Algorithms for QSC I – **Anshumitra Baul**, *Oak Ridge National Laboratory*
	• Quantum Algorithms for QSC II – **Marc Illa Subina**, *Oak Ridge National Laboratory*
5:30 p.m. – 6:30 p.m.	Dinner: Pizza Social in the Discovery Hall of Learning Atrium

INTERNATIONAL YEAR OF
Quantum Science and Technology

Recognizing the importance of quantum science and the need for wider awareness of its past and future impact, dozens of national scientific societies came together to mark 100 years of quantum mechanics with a U.N.–declared international year.

This year-long, worldwide initiative will be observed through activities at all levels aimed at increasing public awareness of the importance of quantum science and applications. Anyone, anywhere can participate in IYQ by helping others to learn more about quantum on this centennial occasion, participating in or organizing an IYQ event, or simply taking the time to learn more about quantum science and technology.

The Purdue Quantum Science and Engineering Institute (PQSEI) is a proud sponsor of the International Year of Quantum Science and Technology.

TUESDAY, APRIL 22, 2025	
8:00 a.m. – 9:00 a.m.	Registration & Breakfast
9:00 a.m. – 9:15 a.m.	Opening Remarks
9:15 a.m. – 9:55 a.m.	Michael Manfra, *Purdue University and Microsoft Quantum* Universal Anyon Tunneling in a Chiral Luttinger Liquid
9:55 a.m. – 10:35 a.m.	John Watson, *Microsoft Quantum* Quantum Computing with Majorana Zero Modes
10:35 a.m. – 10:55 a.m.	Break
10:55 a.m. – 11:35 a.m.	Eugene Polzik, *Niels Bohr Institute* Quantum Measurements in an Entangled Network
11:35 a.m. – 12:15 a.m.	Qi Zhou, *Purdue University* Synthetic Gauge Fields
12:15 p.m. – 2:15 p.m.	Lunch + Poster Session – Enjoy lunch in the Hall of Discovery Learning and Research, then walk 5 minutes to the Birck Nanotechnology Building for the poster session.
2:15 p.m. – 3:15 p.m.	Nick Bronn, *IBM* Simulating Quantum Systems with Programmable Quantum Computers
3:15 p.m. – 3:35 p.m.	Break
3:35 p.m. – 4:15 p.m.	Andrew Sornborger, *Los Alamos National Laboratory* Quantum Phase Estimation, How It Works, and How to Improve It
4:15 p.m. – 4:55 p.m.	Travis Humble, *Oak Ridge National Laboratory* Integrating Quantum Science and Technology into Scientific Discovery
4:55 p.m. – 5:40 p.m.	Panel Discussion
6:00 p.m. – 8:00 p.m.	Dinner – **Lafayette Brewing Company**, 622 Main Street, Lafayette, IN

WEDNESDAY, APRIL 23, 2025	
8:00 a.m. – 9:00 a.m.	Registration/Breakfast
9:00 a.m. – 9:40 a.m.	Vivien Zapf, *Los Alamos National Laboratory* Topological Quantum Materials
9:40 a.m. – 10:20 a.m.	Tanay Roy, *Fermi National Accelerator Laboratory* How to Build a Quantum Computer Using 3D Superconducting Radio Frequency Cavities?
10:20 a.m. – 10:45 a.m.	Break
10:40 a.m. – 11:20 a.m.	Alex Ruichao Ma, *Purdue University* Quantum Simulation in Superconducting Circuits
11:20 a.m. – 12:20 p.m.	Erik Garcell, *Classiq* Building Practical Quantum Solutions: Where Theory Meets Engineering
12:20 p.m. – 2:20 p.m	Lunch + Poster Session – Enjoy lunch in the Hall of Discovery Learning and Research, then walk 5 minutes to the Birck Nanotechnology Building for the poster session.
2:20 p.m. – 3:00 p.m.	Dana Anderson, *Infleqtion and University of Colorado, Boulder* Schrödinger, Maxwell, and AC Matter Waves
3:00 p.m. – 3:20 p.m.	Break
3:20 p.m. – 4:20 p.m.	Victory Omole, *Infleqtion* Universal Quantum Computing on Neutral Atoms
4:20 p.m. – 5:05 p.m.	Panel Discussion
6:00 p.m. – 8:00 p.m.	Speaker Dinner: The Bryant, 1820 Sagamore Pkwy W, West Lafayette, Indiana Participant Networking Dinner: Purdue Memorial Union, The Atlas Family Marketplace. Pick up dinner coupons from event registration table. ONE shuttle from PMU to Hilton Garden Inn at 8PM

THURSDAY, APRIL 24, 2025	
8:00 a.m. – 9:00 a.m.	Registration/Breakfast
9:00 a.m. – 9:40 a.m.	**Misha Lukin,** *Harvard University* Exploring Quantum Computing Frontier with Neutral Atom Systems
9:40 a.m. – 10:20 a.m.	**Enectali Figueroa–Feliciano,** *Northwestern University and Fermilab* Entangling Quantum Computing with Dark Matter
10:20 a.m. – 10:40 a.m.	Break
10:40 a.m. – 11:40 a.m.	**Mike O'Keeffe,** *NVIDIA* Accelerating Quantum Computing
11:40 a.m. – 1:00 p.m.	Lunch
Celebrating 150 Years of Engineering at Purdue	
1:00 p.m. – 1:15 p.m.	**Arvind Raman,** *Purdue University, John A. Edwardson Dean of the College of Engineering, Robert V. Adams Professor of Mechanical Engineering* Welcome remarks
1:15 p.m. – 1:55 p.m.	**Supriyo Datta**, *Purdue University* Schrödinger Equation: 100 Years Later
1:55 p.m. – 2:35 p.m.	**Kaushik Roy,** *Purdue University* Cognitive Computing: Robustness and Security Challenges
2:35 p.m. – 3:00 p.m.	Break
3:00 p.m. – 3:40 p.m.	**Susanne Yelin,** *Harvard University* Atomic Cooperative Arrays in Bio–Inspired Geometries
3:40 p.m. – 4:20 p.m.	**Libai Huang,** *Purdue University* From Light to Matter: Controlling Excitons for Quantum Innovation
4:20 p.m. – 5:00 p.m.	Panel Discussion
5:30 p.m. – 7:30 p.m.	Closing Dinner**: John Purdue Room, Marriott Hall**, 900 Mitch Daniels Blvd., West Lafayette,

The College of Engineering is proud to celebrate "150 Years of Purdue Engineering", a yearlong celebration of Purdue's global leadership in engineering education and innovation and an opportunity to envision a future of consequence

FRIDAY, APRIL 25, 2025	
8:00 a.m. – 9:00 a.m.	Registration/Breakfast
9:00 a.m. – 9:40 a.m.	**Gyeongho Son,** *PsiQuantum* Ultra-low loss and broad band fiber-to-chip interface for silicon-based quantum photonic applications
9:40 a.m. – 10:20 a.m.	**Vladimir Shalaev,** *Purdue University* Integrated Quantum Photonics in Silicon Platform
10:20 a.m. – 10:40 a.m.	**Marco Pistoia,** *J.P. Morgan Chase* Title to be announced
10:40 a.m. – 11:20 a.m.	Break
11:20 a.m. – 12:00 p.m.	**Postdoc Talks**
12:00 p.m. – 12:40 p.m.	**Sebastian Murgueitio Ramirez,** *Purdue University* Quantum Puzzles: Historical Insights and Philosophical Reflections
12:40 p.m. – 1:30 p.m.	Lunch
1:30 p.m.	Lab Tours – Birck Nanotechnology Center

Quantum Science Center Leadership

Travis Humble - *QSC Director*

Humble leads the Center and serves as the primary contact for DOE, as well as leads the co-design/scientific integration and Industry Council coordination. Humble is a distinguished scientist at ORNL, director of the lab's Quantum Computing Institute, an associate professor with the Bredesen Center for Interdisciplinary Research and Graduate Education at the University of Tennessee, and an associate editor for the Quantum Information Processing journal. He received his doctorate in theoretical chemistry from the University of Oregon before coming to ORNL in 2005.

Vivien Zapf - *QSC Deputy Director*

Zapf serves as the secondary contact for DOE and helps oversee QSC research efforts. A scientist at the National High Magnetic Field Laboratory's Pulsed Field Facility located at Los Alamos National Laboratory, her research focuses on using high magnetic fields as tools to induce, probe, and understand potential quantum spin liquid states. Zapf is a fellow of the American Physical Society and currently serves as the chair of APS's Division of Materials Physics, as well as leads the magneto-electric couplings in quantum materials thrust for the Center for Molecular Magnetic Quantum Materials, a DOE Energy Frontier Research Center. She received her Ph.D. in physics from the University of California, San Diego, was a postdoctoral fellow at Caltech, and joined LANL in 2004.

Tom Cook - *Chief Operations Officer*

Cook is the chief operations officer for the QSC. He leads several key focus areas related to operational support, including project management, procurement, intellectual property, communications, and environment, safety, health, and quality. Prior to being named COO, Cook served as the project management director for the Exascale Computing Project. He has a B.S. degree in materials science and engineering from Michigan State University and in 2009 earned his Project Management Professional (PMP)® certification from the Project Management Institute.

Joel Moore - *Chief Scientist*

Moore, a theoretical physicist studying condensed matter, serves as the QSC's chief scientist. His chief research interest is in the properties of "quantum materials," in which electron-electron interactions or wavefunction topology yield new states of matter. Moore joined the physics department at UC Berkeley as an assistant professor in January 2002. He received his A.B. summa cum laude in physics from Princeton University in 1995 and spent a Fulbright year abroad before graduate studies at MIT on a Hertz fellowship.

Alexandra (Sasha) Boltasseva - *Workforce Development Lead*

Boltasseva serves as the QSC's workforce development lead. She is the Ron and Dotty Garvin Tonjes Distinguished Professor of Electrical and Computer Engineering She received her PhD in electrical engineering at Technical University of Denmark, DTU in 2004. Boltasseva specializes in nanophotonics, quantum photonics, and optical materials. She is the 2023 recipient of the R.W. Wood Prize (Optica, formerly Optical Society of America) and 2022 Guggenheim Fellow. She is a Fellow of the National Academy of Inventors (NAI) (2020), MRS (2021), IEEE (2020), Optica (2017), and International Society for Optical Engineers (SPIE) (2015).

Teresa Hurt - *Senior Administrative Assistant*

Hurt is the senior administrative assistant to the director of the QSC. In this position, she works closely with the director, deputy director, and numerous principal investigators providing administrative support. Hurt joined ORNL in 2012. Before the QSC, she provided support to the Climate Change Science Institute and the Computer Science and Mathematics Division.

SPEAKERS

Dana Anderson - *University of Colorado, Boulder and Infleqtion*

Dr. Dana Anderson is Professor of Physics and of Electrical Engineering and is a Fellow of the JILA Institute at the University of Colorado, Boulder. He is also co-Founder and Chief Technology Officer of Infleqtion. He received a BSEE degree from Cornell University in 1975 and his PhD in quantum optics from the University of Arizona in 1981; his thesis focused on the then new technology of ring-laser gyroscopes. Dr. Anderson did his postdoctoral work at Caltech, carrying out the development on the prototype gravitational wave interferometer which later evolved into "LIGO" —the Laser Interferometer Gravitational Wave Observatory. Dr. Anderson joined the faculty at the University of Colorado in 1984 where he continued work on optical gyroscopes and on optical neural networks using dynamic holography. The latter was recognized by the Optical Society of America's R.W. Wood Prize. Dr. Anderson co-founded ColdQuanta (now Infleqtion) in 2007 to become the first manufacturer of quantum components, instruments, and systems based on cold and ultracold atoms. Infleqtion's commercial BEC system drew the attention of NASA's Jet Propulsion Laboratory (JPL), which then led to the NASA Cold Atom Lab (CAL) mission to put a BEC system on the International Space Station. Infleqtion systems have been operating continuously on the ISS for well over five years.

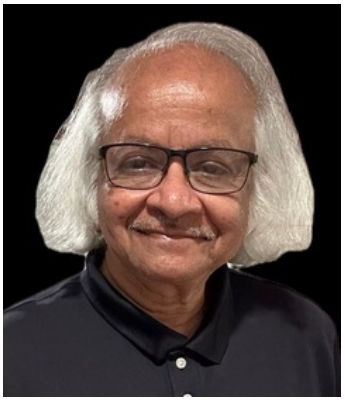
Anshumitra Baul - *Oak Ridge National Laboratory*

Anshumitra Baul is a Postdoctoral Research Associate in Oak Ridge National Laboratory in Quantum Information Science Section. Her work explores quantum simulations and the application of machine learning techniques in the context of many-body systems. The research focuses on understanding quantum properties of materials using quantum simulations of their states and dynamics. Her Ph.D. in Condensed Matter Theory and Quantum Computation is from the Department of Physics and Astronomy at Louisiana State University in 2024.

Nick Bronn - *IBM*

After earning his Ph.D. in experimental Condensed Matter Physics from the University of Illinois, supported in part by a National Science Foundation Graduate Research Fellowship, Nick joined IBM Quantum as a post-doctoral researcher in 2013. Continuing as a Research Staff Member since 2015, he was responsible for developing and integrating quantum hardware, conducting experiments on superconducting qubits and deploying quantum systems over the cloud. Changing roles in 2020 to use open-source software such as Qiskit to conduct "experiments" on quantum computing platforms, he now enables quantum computing practitioners to achieve the highest performance from IBM quantum systems through hands-on guidance of their partners, digital content creation such as videos, tutorials, and documentation, and publishing peer-reviewed articles in the scientific literature with collaborators in academia and national laboratories.

Supriyo Datta – *Purdue University*



Supriyo Datta received his PhD from University of Illinois at Urbana-Champaign in 1979 working on surface acoustic wave devices and has been with Purdue University since 1981. The non-equilibrium Green function (NEGF) method approach pioneered by his group for the description of quantum transport has been extensively adopted both in academic research and in computer-aided design tools by companies at the forefront of semiconductor technology. It is also used by quantum chemists working on molecular electronics.

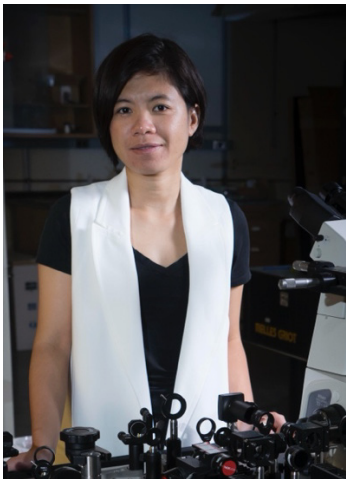
Datta is credited with introducing spin-orbit coupling as a means to control electron spin with an electric field rather than a magnetic field. This relativistic effect is now widely used in spintronics and quantum computing. He is also well known for his innovative theoretical proposals that have inspired new fields of research, including molecular thermoelectricity, negative capacitance devices, and spintronics

Enectali Figueroa-Feliciano - *Northwestern University and Fermi National Accelerator Laboratory*

Enectali Figueroa-Feliciano began his career as an astrophysicist and was the Principal Investigator of the NASA Micro-X sounding rocket, an X-ray space telescope with a cryogenic high-energy-resolution imaging spectrometer which flew in 2018 and 2022. He worked on dark matter searches early in his career as part of the SuperCDMS collaboration, which is now fielding the SuperCDMS SNOLAB experiment to probe new regions of parameter space in the search for dark matter. He is a member of the Ricochet and CUPID neutrino experiments, both searching for new physics in the neutrino sector. His latest work is at the intersection of particle physics and quantum computing, studying the effects of radiation and cosmic-ray backgrounds in superconducting qubits, understanding other sources of decoherence in qubits and their mitigation, researching uses of QIS technologies for particle physics.

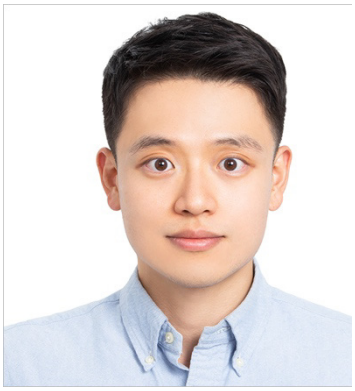
Erik Garcell - *Classiq Technologies*

Dr. Erik Garcell is the Director of Quantum Enterprise Development (North America) at Classiq Technologies, where he helps organizations integrate quantum computing into real-world applications. His work bridges the gap between academic research and industry adoption, ensuring that quantum technology moves from theory to practical impact. Previously, Erik served as Innovation Product Manager at IP.com, where he led the development of intellectual property analytics solutions, and as an Innovation Research Scientist at Kodak Alaris, where he worked on emerging imaging and AI-driven technologies. He holds a Ph.D. in Physics from the University of Rochester and an M.S. in Technical Entrepreneurship and Management from Rochester's Simon School of Business.



Libai Huang – *Purdue University*

Libai Huang is a Tarpo professor of chemistry in the College of Science and director of the Quantum Photonic Integrated Design Center Energy Frontier Research Center. Huang leads a pioneering research program dedicated to directly imaging energy and charge transport with femtosecond time resolution and nanometer spatial resolution using ultrafast microscopy. Her work aims to uncover the transport dynamics of excitons and charges in solar energy and quantum materials. She earned a Bachelor of Science in chemistry from Peking University, a Ph.D. in chemistry from the University of Rochester and was a postdoctoral fellow at Argonne National Laboratory from 2006 to 2008.



Gyeongho Son – *PsiQuantum*

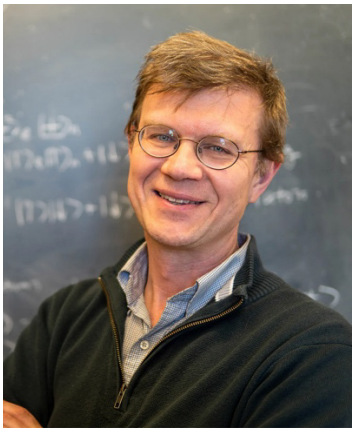
Short Bio: Gyeongho Son is a Senior R&D Engineer at PsiQuantum, where he works on photonics and photonic quantum computing. He received his Ph.D. in Electrical Engineering from KAIST in 2021. His prior research includes work at UC Berkeley and KAIST, and his contributions have been published in journals such as *Nature* and *Nanophotonics*.

Marc Illa Subina – *Oak Ridge National Laboratory*

Marc received his PhD from the University of Barcelona in 2021, where he used lattice QCD to simulate low-energy few-body nuclear systems and reactions. As a Postdoctoral Fellow at the University of Washington, in association with the Quantum Science Center, he focuses on simulating Standard Model physics using quantum computers. In particular, he conducts large-scale simulations on current noisy qubit devices using scalable algorithms, and develops theoretical frameworks for qubit-based computers, to study nuclear and high-energy systems beyond the reach of classical computation.

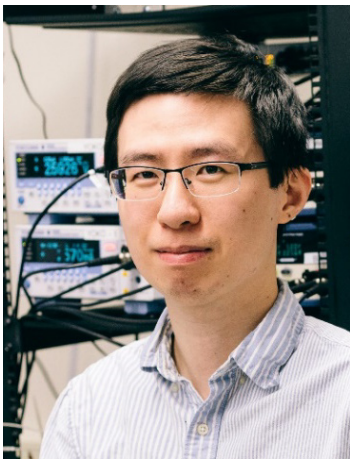
Olivia Liebman - *UCLA*

Olivia is a Ph.D. student in the materials science department at UCLA. She completed her B.S. in physics from UCLA in 2015, and her master's degree in materials science from the University Michigan, Ann Arbor, in 2019. Olivia's current research interests lie within the realm of condensed matter theory and topological materials. The emphasis of her Ph.D. work focuses on out-of-equilibrium dynamics, topological materials, axion collective modes in condensed matter systems, and exploring the intersection of condensed matter with high energy physics.



Mikhail Lukin – *Harvard University*

Professor Mikhail (Misha) Lukin's group at Harvard University focuses on both the theoretical and experimental studies in quantum optics, atomic physics, and quantum information science. The emphasis is on studies of quantum systems consisting of strongly interacting photons, atoms, molecules and electrons. They are developing new techniques for controlling quantum dynamics and studying the relevant fundamental physics phenomena.



Alex Ruichao Ma – Purdue University

Alex Ruichao Ma received his Ph.D. in Physics from Harvard University in 2014, where he studied many-body physics using ultracold atoms in optical lattices. From 2015 to 2019, he worked on superconducting qubits for quantum simulation as a Kadanoff-Rice Postdoctoral Fellow at the James Franck Institute, University of Chicago. In 2019, Alex joined Purdue University as an Assistant Professor in the Department of Physics and Astronomy. His experimental group focuses on quantum many-body physics and quantum information science using superconducting circuits. He is a recipient of the NSF CAREER Award in 2022.

Michael Manfra – *Purdue University and Microsoft Quantum*

Michael Manfra is the Director of the Purdue Quantum Science and Engineering Institute (PQSEI). He is also the Bill and Dee O'Brien Distinguished Professor of Physics and Astronomy, Professor of Materials Engineering, and Professor of Electrical and Computer Engineering at Purdue University. He serves as Scientific Director of Microsoft Quantum Lab West Lafayette. Mike received his A.B. from Harvard in 1992 and PhD from Boston University in 1999. Mike spent 2 years from 1998 to 2000 as a Postdoctoral Member of the Technical Staff at Bell Laboratories, Lucent Technologies and in 2001 he was promoted to Member of Technical Staff at Bell Laboratories where he conducted research in low-dimensional semiconductor systems. After 10 years at Bell Labs, Manfra joined Purdue in 2009. Mike was a Keck Foundation awardee in 2013, was elected a Fellow of the American Physical Society in 2015, and in 2016 became the Scientific Director of Microsoft Quantum Lab West Lafayette. Manfra and his team develop new nanoscale electronic devices to explore fundamental aspects of topology and strong electronic correlations. In 2020, his group reported interferometric measurement of anyon braiding, giving experimental evidence for a theoretical prediction made 40 years earlier. Working with Microsoft Quantum he works to develop scalable quantum hardware leveraging the novel properties of anyons.

Mike O'Keeffe – *NVIDIA*

Mike O'Keeffe is a Senior Solutions Architect on the Higher Education and Research team at NVIDIA. In this role he supports researchers, research computing and university leadership in accelerating computational solutions bridging AI, ML, physics, and quantum computing for scientific applications. Mike received his PhD in physics from the City University of New York

Sebastian Murgueitio Ramirez – *Purdue University*

Sebastian Murgueitio Ramirez is an Assistant Professor of Philosophy at Purdue University. From 2021 to 2022, he was a postdoctoral fellow at the University of Oxford. He earned his Ph.D. in the History and Philosophy of Science program at the University of Notre Dame, where Ihe also completed a master's degree in physics. His research focuses primarily on the history and philosophy of physics. He has published over a dozen articles in peer-reviewed journals across philosophy, history of science, and physics.

Victory Omole - *Infleqtion*

Victory Omole is a Senior Quantum Software Engineer at Infleqtion. He mostly works on designing and running error correcting codes on neutral atom quantum computers

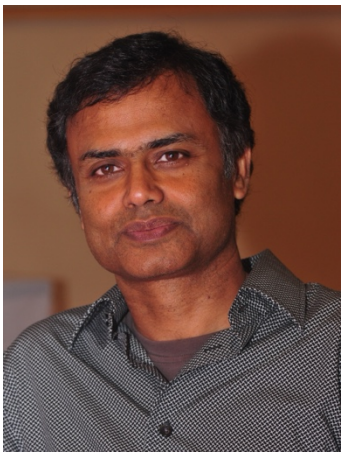
Marco Pistoia - *JPMorgan Chase*

Marco Pistoia, PhD, is Managing Director, Distinguished Engineer and Head of JPMorgan Chase's Global Technology Applied Research (formerly Future Lab for Applied Research and Engineering), where he leads research in Quantum Computing, Quantum Communication, Cloud Networking, Augmented and Virtual Reality (AR/VR), Internet of Things (IoT), and Blockchain and Cryptography. He joined JPMorgan Chase in January 2020. Formerly, he was a Senior Manager, Distinguished Research Staff Member and Master Inventor at the IBM Thomas J. Watson Research Center in New York, where he managed an international team of researchers responsible for Quantum Computing Algorithms and Applications. He holds over 250 patents, more than 40 of which are in Quantum Computing.

Eugene Polzik - *Niels Bohr Institute at the University of Copenhagen*

Eugene Polzik is Professor of Physics at the Niels Bohr Institute at the University of Copenhagen. He is Leader of the Quantum Optics Center QUANTOP and Director of the Copenhagen Center for Biomedical Quantum Sensing. His research interests are within quantum physics of matter and light, quantum communication, and quantum sensing. Among his notable results are the demonstration of the quantum teleportation between material objects, a quantum memory for light, generation of entanglement between distant material objects, a quantum optical interface with ultracold atoms, and measurements of motion and fields not restricted by the Heisenberg uncertainty. Eugene Polzik has published more than 180 papers in refereed journals including a number of papers in Science and Nature journals. He is a member of the Royal Danish Academy of Sciences, Fellow of the American Physical Society and Fellow of the Optical Society of America. Eugene Polzik is the Knight of the Order of Dannebrog, a recipient the Herbert Walther Award of Optical Society of America and German Physical Society, the Gordon Moore Distinguished Scholar award, the Scientific American Research Leadership award, and the Danish Association of Academics award.

Kaushik Roy – *Purdue University*



Kaushik Roy is the Edward G. Tiedemann, Jr., Distinguished Professor of Electrical and Computer Engineering at Purdue University. He received his BTech from IIT Kharagpur and PhD from the University of Illinois at Urbana-Champaign. After working at Texas Instruments on FPGA and low-power design, he joined Purdue, where his research now focuses on neuromorphic computing, machine learning, and energy-efficient circuits and architectures. He has supervised over 100 PhD students and co-authored two books on low-power CMOS design. A Fellow of IEEE, Dr. Roy has received numerous prestigious awards, including the NSF CAREER Award, DoD Vannevar Bush Faculty Fellowship, Humboldt Research Award, and an honorary doctorate from Aarhus University. He previously led the Center for Brain-Inspired Computing (C-BRIC) and currently leads the Institute of Chips and AI. He is also the lead researcher for the $26M CHEETA: CMOS+MRAM Hardware for Energy-EfficienT AI project.

Tanay Roy - *Fermi National Accelerator Laboratory*

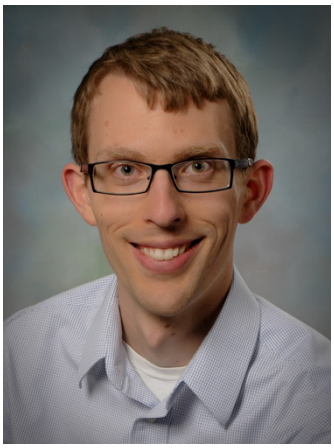
Dr. Tanay Roy is an Associate Scientist at the Superconducting Materials and Systems Center led by Fermilab, where he serves as the Deputy Head of the "3D Quantum Systems" department. His current role focuses on leading the development of a cutting-edge 3D quantum computing architecture utilizing state-of-the-art superconducting radio-frequency cavities with the goal of constructing a prototype quantum computer with significantly improved coherence times and controllability

Vladimir Shalaev – *Purdue University*

Vladimir M. Shalaev, Scientific Director for Nanophotonics at Birck Nanotechnology Center and Distinguished Professor of Electrical and Computer Engineering at Purdue University, specializes in nanophotonics, plasmonics, optical metamaterials and quantum photonics. Prof. Shalaev has received several awards for his research, including the APS Frank Isakson Prize for Optical Effects in Solids, the Max Born Award of the Optical Society of America for his pioneering contributions to the field of optical metamaterials, the Willis E. Lamb Award for Laser Science and Quantum Optics, IEEE Photonics Society William Streifer Scientific Achievement Award, Rolf Landauer medal of the Electrical, Transport and Optical Properties of Inhomogeneous Media International Association and the UNESCO Medal for the development of nanosciences and nanotechnologies. Prof. Shalaev is recognized as a Highly Cited Researcher in Physics by the Web of Science Group in 2017-2023. He is a Fellow of the IEEE, APS, SPIE, MRS and Optica.

Andrew Soronborger - *Los Alamos National Laboratory*

A multifaceted research scientist and thought leader in the areas of neuroscience, statistical data analysis, and quantum computing with a passion for helping organizations move beyond what is present, obvious, and known, Dr. Andrew Sornborger is the Quantum Algorithms and Simulation Lead at the Quantum Science Center in Los Alamos National Lab.

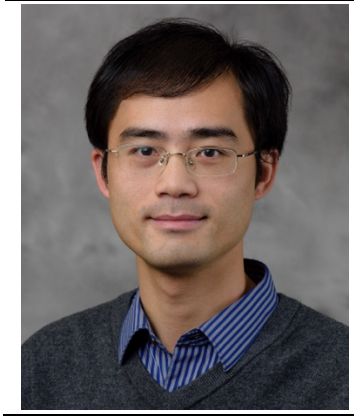


John Watson - *Microsoft Quantum*

John Watson is a Principal Research Manager in Microsoft Quantum, based in Redmond, WA where he works on the development of topological qubits. He received a PhD from Purdue University with a research focus on growth of high mobility GaAs two-dimensional electron gases by molecular beam epitaxy and low temperature electrical transport experiments in the fractional quantum Hall regime. Prior to joining Microsoft, he conducted post-doctoral research at TU Delft, exploring quasiparticle poisoning and dispersive readout techniques in hybrid superconductor-semiconductor nanowires.

Susanne Yelin - *Harvard*

Serving as Vice Director of Max Planck/Harvard Research Center for Quantum Optics, Professor Susanne Yelin's group studies theoretical quantum optics and quantum information science. Their current research directions include quantum control of ultracold polar molecules, investigation of novel coherence-based optical elements, single-photon nonlinear optics using dipolar systems, coherent metamaterials and negative refractivity, coherent control in condensed matter systems, as well as superradiance.



Qi Zhou – *Purdue University*

Qi Zhou is a professor in the Department of Physics and Astronomy at Purdue University. His research interests include synthetic gauge fields, strongly interacting bosons and fermions, quantum nonequilibrium dynamics, and connections between few-body and many-body physics. Qi Zhou received his Ph.D. degree from The Ohio State University and his B.S. degree from Tsinghua University, China.

QSC SUMMER SCHOOL PLANNING COMMITTEE:

Alexandra Boltasseva, Ron and Dotty Garvin Tonjes Distinguished Professor of Electrical and Computer Engineering

Sam Cleveland, Event Planner, Purdue Conferences

Ashley Hannah, Graduate Student/Administrative Support, PQSEI

Jennifer Jeffries, Operations and Communication Manager, PQSEI

Ryan Linehan, Fermilab, Research Associate within the Quantum Science Center Fermilab,

Thomas Roth, Assistant Professor of Electrical and Computer Engineering

David Stewart, Executive Director, Purdue Quantum Science and Engineering Institute (PQSEI)