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Education

- 1992 Ph.D., Physics, University of Colorado, Boulder, CO (Advisor: Carl Wieman)
1987 S.B., Physics, Massachusetts Institute of Technology, Cambridge MA (Advisor: Michael Feld)
1983 Detroit Catholic Central High School, Redford MI

Positions

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|-----------|---|--|
| 2021– | Duke University, Durham, NC | Professor of Physics and Electrical and Computer Engineering |
| 2018–2019 | IonQ, Inc., College Park | Chief Executive Officer |
| 2018–2020 | University of Maryland, College Park | Professor, Electrical and Computer Engineering Dept. |
| 2016– | IonQ, Inc., College Park | Chief Scientist and Co-Founder |
| 2015–2020 | University of Maryland, College Park | Distinguished University Professor |
| 2014–2020 | University of Maryland, College Park | Fellow, Center for Quantum Info. and Comp. Science (QuICS) |
| 2007–2020 | University of Maryland, College Park | Fellow, Joint Quantum Institute (JQI) |
| 2007–2020 | University of Maryland, College Park | Bice Zorn Professor of Physics |
| 2006–2007 | University of Michigan, Ann Arbor | Director, FOCUS (NSF Frontier Center on Ultrafast Science) |
| 2006–2007 | University of Michigan, Ann Arbor | Professor, Electrical Engineering and Computer Science Dept. |
| 2003–2007 | University of Michigan, Ann Arbor | Professor, Physics Dept. |
| 2000–2003 | University of Michigan, Ann Arbor | Associate Professor, Physics Dept. |
| 1995–2000 | University of Colorado, Boulder | Adjunct Lecturer, Physics Dept. |
| 1994–2000 | National Inst. of Stand. Tech., Boulder | Staff Physicist and Project Leader |
| 1992–1994 | National Inst. of Stand. Tech., Boulder | NRC Postdoctoral Researcher (Mentor: David Wineland) |

Fellowships and Awards

- Fellow, Optical Society of America (2020)
Willis E. Lamb Award for Laser Science and Quantum Optics (2019)
Member, National Academy of Sciences (2016)
American Physical Society Arthur Schawlow Prize for Laser Science (2015)
University of Maryland College of Science Distinguished Faculty Award (2014)
Fellow, American Association for the Advancement of Science (2012)
Scientific American “50” Research Award (2006)
University of Michigan Faculty Distinguished Research Award (2005-2006)
Fellow, American Physical Society (2005)
Fellow, UK Institute of Physics (2002)
Distinguished Traveling Lecturer, American Physical Society Division of Laser Science (2002–)
American Physical Society I.I. Rabi Award (2001)
International Quantum Communication Award, Tamagawa University, Japan (2000)
US Presidential Early Career Award for Scientists and Engineers (1997)
National Research Council Postdoctoral Fellowship (1992-1994)
University of Colorado Feldkamp Award for Graduate Research (1990)

Service

Committees

- US Presidential National Quantum Initiative Advisory Committee (NQIAC) (2020–)
American Physical Society Div. AMO Physics (DAMOP): **Chair** (2010), Chair-Elect (2009), Vice-Chair (2008).
American Physical Society Topical Group on Quantum Information: Executive Committee (2008-2010).
American Physical Society Committee on Meetings: **Chair** (2005), Member (2003-2004).

National Academy of Sciences Committee on AMO science (CAMOS): **Chair** (2012-2015), Member (2009-2011).
National Academy of Sciences Committee on AMO science (AMO2010 decadal report, 2005-2006).

Boards

Max Planck Institute for Quantum Optics, Scientific Advisory Board (2018–)
CalTech Institute for Quantum Information and Matter, Advisory Board (2018–)
Center for Quantum Technology, National University of Singapore: Technical Advisory Board (2018–).
National Academies of Sciences Intelligence Science and Technology Experts Group (ISTEG) (2015–)
DoD Advisory Board for Quantum Sciences and Engineering at ARL, AFRL, and NRL (2015–).
JILA and Univ. of Colorado NSF Physics Frontier Center External Advisory Board (2014–).
Center for Quantum Information, Tsinghua University, Beijing, China: International Advisory Board (2012–).
Institute for Quantum Computing, University of Waterloo, Canada: Scientific Advisory Committee (2010–).
Networked Quantum Information Technology Hub, Oxford University, UK: Scientific Advisory Committee (2013–).
Physics and Engineering Physics Department, Stevens Institute of Technology: External Advisory Board (2009–).

Organization and Outreach

General Chair, Quantum 2.0 Optical Society of America bi-annual conference (2020–).
US National Quantum Initiative Founding Stakeholder; testified to US Congress in Oct 2017 and May 2018.
Founding Organizer, Biennial Michigan Summer School on Quantum Physics (2008–2014).
Chair, Gordon Research Conference on Atomic Physics (2007).
Director, *Enrico Fermi International School of Physics* on “Quantum Information Science” (2001).

Editorial

Nature: Quantum Information: Editorial Board (2015–).
Journal of Optics B: Editorial Board (2003-2007), Advisory Board (2008-2012).
Journal of Quantum Information (Rinton Press): Editorial Advisory Board (2000–).

Research Interests

I am an experimentalist in the areas of quantum information systems, quantum computing, quantum communication, atomic, molecular, and optical physics, and quantum optics. My research interests include:

Quantum Information Systems. Quantum information science exploits the properties of quantum superposition and quantum entanglement to store and process information in ways that are not possible classically. I have a longstanding interest in the fabrication of quantum processing systems using atoms and photons, natural carriers of quantum information. This includes the design and realization of entangling quantum logic gates between atoms, the quantum networking of remotely-located atoms with photons, and the scaling to much larger numbers of atomic quantum bits with advanced microfabricated atom trap array and photonic structures.

Cold Atomic Physics. Atoms can be localized to nanometer precision with electromagnetic fields and laser cooling techniques. My interest in this area involves the use of laser radiation to prepare, characterize, and exploit nearly-pure quantum states of internal (electronic) and external (motional) degrees of freedom of cold atoms and ions in order to generate controllable interactions and quantum entanglement for studies of quantum many-body systems.

The Interface between Atomic and Condensed Matter Physics. My group has led the development of atomic quantum simulators that can emulate intractable Hamiltonians that are found in contexts such as quantum magnetism and strongly-correlated condensed matter. We have also developed the use of microfabricated semiconductor structures for confining individual atomic ions in free space, while also characterizing the electrical noise processes of semiconductor and other electrode materials using single atoms as sensitive probes. More generally, I am interested in juxtaposing atomic systems with mesoscopic condensed-matter systems, including photonic couplings between atomic ions and quantum dots and electro-mechanical couplings between mesoscopic oscillators and atoms.

Ultrafast Control of Cold Atoms. I am actively pursuing the use of ultrafast ($\sim 10^{-12}$ s) optical techniques for the manipulation and control of cold atomic systems and the generation of multi-atom entangled quantum states. Ultrafast control eliminates sensitivity to slower decoherence processes, and represents a new regime of ultracold atomic physics.

Foundations of Quantum Mechanics. I have a longstanding interest in foundational aspects of quantum mechanics, from quantum measurement, quantum decoherence, and alternative interpretations of quantum mechanics, to the general phenomenon of quantum entanglement and various forms of Bell's Inequalities. I am interested in quantum metrology and the border between quantum and classical physics as system complexity grows. I enjoy conveying quantum tenets to younger students and the public, with heavy reliance on analogies from the visual and musical arts.

Grants (\$5.2M external funding in AY2020-2021)

- 2020-2025, DOE Office of Science (\$12,500,000 to Duke), “Quantum Systems Accelerator,” co-PI with 12 others
- 2019-2024, MURI/AFOSR (\$1,250,000 to UMD), “Dissipative Control of Quantum Systems,” co-PI with 6 others
- 2018-2020, DOE Basic Energy Sciences, “Developing and Running Quantum Algorithms for Chemistry and Materials” (\$1,260,000 to UMD); co-PI with 7 others
- 2018-2020, DOE High Energy Physics, “The Geometry and Flow of Quantum Information: From Quantum Technology to Quantum Gravity” (\$452,000 to UMD); co-PI with 11 others.
- 2018-2020, DARPA DRINQS Program, “Driven Quantum Matter for Memory and Metrology (DQM³),” (\$987,500 to UMD); co-PI with 7 others
- 2018-2023, NSF/PFCQC (\$3,410,000 to UMD) “STAQ: Software-Tailored Arch. for Quantum co-design,” co-PI with 7 others.
- 2018-2023, MURI/AFOSR (\$1,250,000 to UMD), “Scalable Certification of Quantum Devices and Networks”
- 2016-2021, MURI/ARO (\$1,250,000 to UMD), “Modular Quantum Circuits”
- 2016-2021, IARPA/ARO LogiQ Program (\$10,300,000 to UMD) “Error-Corrected Univ. Ion Trap Quant. Comp., co-PI with 8 others
- 2015-2020, ARL – (\$1,000,000) “Quantum Networks,” co-PI with 12 others
- 2014-2017, Intelligence Community Postdoctoral Fellowship – National Geospatial Agency (\$350,000).
- 2015-2017, LPS – (\$580,000) “Ultrafast Quantum Gates with Trapped Ions,” PI
- 2014-2018, ARO – (\$800,000) “Quantum Dynamics with Trapped Ion Spin Chains,” PI.
- 2014-2016, Lockheed, Inc – (\$1,800,000) “LM/UMD Quantum Engineering Center,” PI and Director.
- 2014-2019, MURI/AFOSR (\$1,250,000 to UMD), “Wiring Quantum Networks with Mechanical Transducers”
- 2014-2019, MURI/AFOSR (\$1,750,000 to UMD), “Optimal Measurements for Scalable Quantum Technologies”
- 2014-2019, NSF Physics Frontier Center (\$500,000) “JQI: Processing Quantum Coherence,” co-PI.
- 2012-2015, DARPA Defense Science Office (\$670,000 to UMD), “Scalable Platform for Agile extended-Reach Quantum Communication (SPARQC),” co-PI with 8 others at 6 institutions.
- 2011-2013, AFOSR/STTR (\$270,000 to UMD) “Monolithic quartz ion trap chip” with Translume, Inc.
- 2010-2015, IARPA/ARO MQCO Program (\$3,450,000 to UMD) “Modular Universal Scalable Ion Trap Quantum Computer (MUSIQC),” co-PI with 6 others at 6 institutions.
- 2010-2012, European Commission AQUITE Network (\$280,000) “Quantum Technology with Atoms”
- 2010-2011, DURIP/ARO (\$138,000) “Modelocked Laser for Ultrafast Quantum Gates.”
- 2009-2012, NSF Physics at the Information Frontier (\$450,000) “Photonic Networking of Trapped Ion Qubits.”
- 2009-2014, MURI/ARO (\$1,125,000 to UMD), “Quantum-Optical Circuits of Hybrid Quantum Memories,” Lead PI, with 11 co-PIs.
- 2008-2011, Intelligence Community Postdoctoral Fellowship – National Geospatial Agency (\$350,000).
- 2008-2013, NSF Physics Frontier Center (\$500,000) “JQI: Processing Quantum Coherence,” co-PI at the Joint Quantum Institute and the University of Maryland.
- 2008-2009, IARPA/ARO (\$500,000), “Trapped Ion Quantum Networks,” PI.
- 2007-2013, DARPA OLE Program (\$1,575,000 to UMD), “Quantum Simulation of Magnetic Spin Phases with Atoms and Ions in Optical Lattices,” Lead PI, with 13 co-PIs.
- 2006-2009, NSF Physics at the Information Frontier (\$450,000) “Photonic Networking of Trapped Ion Qubits.”
- 2005-2006, DURIP – Army Research Office (\$115,000) “Ultrafast Photoionization Loading of Ion Traps.”
- 2005-2006, DARPA and MEMS Exchange (\$205,000), “MEMS fabrication of silicon ion traps.”
- 2004-2008, Army Research Office and DTO (\$2,200,000) “Trapped Ion Quantum Information Processing”
- 2003-2004, NIST SBIR and Aerophysics, Inc. (\$120,000) “Microscale Mass Spectrometer Arrays,” co-PI with PIs L. B. King (Michigan Tech) and S. Satyuk (Aerophysics, Inc.)
- 2003-2006, NSF Information Tech. Research (\$2,300,000) “Trapped Ion Cavity-QED,” co-PI with M. Chapman (Georgia Tech)
- 2001-2008, NSF Physics Frontier Centers (\$750,000) “FOCUS: Frontiers of Optical Coherent and Ultrafast Science,” PI and Director (2006-2007); co-PI with 26 others at Univ. Michigan and Univ. Texas (2001-2005).
- 2001-2004, ARDA/ARO (\$1,600,000) “Trapped Ion Quantum Computing.”
- 2001-2002, ARO/DURIP (\$120,000) “High-fidelity Optical Processes in Trapped Atoms.”
- 2001-2004, NSF Information Technology Research (\$500,000) “Entanglement of Atomic Cadmium Ions.”
- 1995-2000, NSA (\$2,500,000), “Ion Trap Quantum Computing,” co-PI with D. Wineland (NIST).

Patents and Intellectual Property

- 6 awarded patents
- 26 pieces of intellectual property pending patent awards

Research Journal Publications (>44,000 citations, h=82)

1. “Fault-Tolerant Operation of a Quantum Error-Correction Code,” L. N. Egan, D. M. Debroy, C. Noel, A. Risinger, D. Zhu, D. Biswas, M. Newman, M. Li, K. R. Brown, M. Cetina, and C. Monroe, arXiv:2009.11482 (2020).
2. “Quantum Gates on Individually-Addressed Atomic Qubits Subject to Noisy Transverse Motion,” M. Cetina, L. N. Egan, C. A. Noel, M. L. Goldman, A. R. Risinger, D. Zhu, D. Biswas, and C. Monroe, arXiv:2007.06768 (2020).
3. “The Character of Motional Modes for Entanglement and Sympathetic Cooling of Mixed-Species Trapped Ion Chains,” K. Sosnova, A. Carter, and C. Monroe, arXiv:2004.08045 (2020).
4. “Efficient ground-state cooling of large trapped-ion chains with an EIT tripod scheme,” L. Feng, W. L. Tan, A. De, A. Menon, A. Chu, G. Pagano, and C. Monroe, arXiv:2004.05190 (2020).
5. “Resource-Optimized Fermionic Local-Hamiltonian Simulation on Quantum Computer for Quantum Chemistry,” Q. Wang, M. Li, C. Monroe, Y. Nam, arXiv:2004.04151 (2020).
6. “Universal one-dimensional discrete-time quantum walks and their implementation on near term quantum hardware,” S. Singh, C. H. Alderete, R. Balu, C. Monroe, N. M. Linke, and C. M. Chandrashekar, arXiv: 2001.11197 (2020).
7. “Many-Body Dephasing in a Trapped-Ion Quantum Simulator,” H. B. Kaplan, L. Guo, W. L. Tan, A. De, F. Marquardt, G. Pagano, and C. Monroe, arXiv: 2001.02477 (2020).
8. “Observation of Domain Wall Confinement and Dynamics in a Quantum Simulator,” L. Tan, P. Becker, F. Liu, G. Pagano, K. S. Collins, A. De, L. Feng, H. B. Kaplan, A. Kyprianidis, R. Lundgren, W. Morong, S. Whitsitt, A. V. Gorshkov, C. Monroe, arXiv: 1912.11117 (2019).
9. “Noise reduction using past causal cones in variational quantum algorithms,” Omar Shehab, Isaac H. Kim, Nhung H. Nguyen, Kevin Landsman, Cinthia H. Alderete, Daiwei Zhu, C. Monroe, Norbert M. Linke, arXiv 1906.00476 (2019).
10. “Quantum walks and Dirac cellular automata on a programmable trapped-ion quantum computer,” C. H. Alderete, S. Singh, N. Nguyen, D. Zhu, R. Balu, C. Monroe, C. M. Chandrashekar, and N. M. Linke, **Nature Communications** **11**, 3720 (2020).
11. “Quantum Approximate Optimization with a Trapped-Ion Quantum Simulator,” G. Pagano, A. Bapat, P. Becker, K. S. Collins, A. De, P. W. Hess, H. B. Kaplan, A. Kyprianidis, W. L. Tan, C. Baldwin, L. T. Brady, A. Deshpande, F. Liu, S. Jordan, A. V. Gorshkov, C. Monroe, **Proc. Nat. Acad. Sci.** **117**, 25396 (2020).
12. “Variational Generation of Thermofield Double States and Critical Ground States with a Quantum Computer,” D. Zhu, S. Johri, N. M. Linke, K. A. Landsman, N. H. Nguyen, C. H. Alderete, A. Y. Matsuura, T. H. Hsieh, C. Monroe, **Proc. Nat. Acad. Sci.** **117**, 25402 (2020).
13. “Towards analog quantum simulations of lattice gauge theories with trapped ions,” Z. Davoudi, M., C. Monroe, G. Pagano, A. Seif, and A. Shaw, **Phys. Rev. Research** **2**, 023015 (2020).
14. “Two-qubit entangling gates within arbitrarily long chains of trapped ions,” K. A. Landsman, Y. Wu, P. H. Leung, D. Zhu, N. M. Linke, K. R. Brown, L.-M. Duan, and C. Monroe, **Phys. Rev. A** **100**, 022332 (2019).
15. “Toward convergence of effective field theory simulations on digital quantum computers,” O. Shehab, K. A. Landsman, Y. Nam, D. Zhu, N. M. Linke, M. J. Keesan, R. C. Pooser, and C. Monroe, **Phys. Rev. A** **100**, 062319 (2019).
16. “Benchmarking an 11-qubit quantum computer,” K. Wright, et al., **Nature Communications** **10**, 5464 (2019).
17. “Ground-state energy estimation of the water molecule on a trapped ion quantum computer,” Y. Nam, et al., **Nature Quantum Information** **6**, 33 (2020).
18. “Heisenberg-Scaling Measurement Protocol for Analytic Functions with Quantum Sensor Networks,” K. Qian, Z. Eldredge, W. Ge, G. Pagano, C. Monroe, J. V. Porto, and A. V. Gorshkov, **Phys. Rev. A** **100**, 042304 (2019).
19. “Parallel Entangling Operations on a Universal Ion Trap Quantum Computer,” C. Figgatt, A. Ostrander, N. M. Linke, K. A. Landsman, D. Zhu, D. Maslov, C. Monroe, **Nature** **567**, 61 (2019)
20. “Verified Quantum Information Scrambling,” K. A. Landsman, C. Figgatt, T. Schuster, N. M. Linke, B. Yoshida, N. Y. Yao, C. Monroe, **Nature** **567**, 61 (2019); [News and Views].
21. “Confined Quasiparticle Dynamics in Long-Range Interacting Quantum Spin Chains,” F. Liu, R. Lundgren, P. Titum, G. Pagano, J. Zhang, C. Monroe, and A. V. Gorshkov, **Phys. Rev. Lett.** **122**, 150601 (2019).
22. “Training of Quantum Circuits on a Hybrid Quantum Computer,” D. Zhu, N. M. Linke, M. Benedetti, K. A. Landsman, N. H. Nguyen, C. H. Alderete, A. Perdomo-Ortiz, N. Korda, A. Garfoot, C. Brecque, L. Egan, O. Perdomo, and C. Monroe, **Science Advances** **5**, eaaw9918 (2019).
23. “High Purity Single Photons Entangled with an Atomic Memory,” C. Crocker, M. Lichtman, K. Sosnova, A. Carter, S. Scarano, and C. Monroe, **Optics Express** **27**, 28143 (2019).
24. “Quantum repeaters based on two species trapped ions,” Santra, S. Muralidharan, M. Lichtman, L. Jiang, C. Monroe, and V. S. Malinovskiy, **New J. Phys.** **21** 073002 (2019).

25. “Cryogenic Trapped-Ion System for Large Scale Quantum Simulation,” G. Pagano, P.W. Hess, H. B. Kaplan, W. L. Tan, P. Richerme, P. Becker, A. Kyprianidis, J. Zhang, E. Birkelbaw, M. R. Hernandez, Y. Wu, C. Monroe, **Quantum Sci. Tech.** **4**, 014004 (2018).
26. “Measuring the Renyi entropy of a two-site Fermi-Hubbard model on a trapped ion quantum computer,” N. M. Linke, S. Johri, C. Figgatt, K. A. Landsman, A. Y. Matsuura, and C. Monroe, **Phys. Rev. A** **98**, 052334 (2018).
27. “Machine Learning Assisted Readout of Trapped Ion Qubits,” A. Seif, K. A. Landsman, N. M. Linke, C. Figgatt, C. Monroe, and M. Hafezi, **J. Phys. B: At. Mol. Opt. Phys.** **51** 174006 (2018).
28. “Demonstration of a Bayesian Quantum Game on an Ion Trap Quantum Computer,” N. Solmeyer, N. M. Linke, C. Figgatt, K. A. Landsman, R. Balu, G. Siopsis, C. Monroe, **Quantum Sci. Tech.** **3**, 045002 (2018).
29. “Observation of Hopping and Blockade of Bosons in a Trapped Ion Spin Chain,” S. Debnath, N. M. Linke, S.-T. Wang, C. Figgatt, K. A. Landsman, L.-M. Duan, and C. Monroe, **Phys. Rev. Lett.** **120**, 073001 (2018).
30. “Robust two-qubit gates in a linear ion crystal using a frequency-modulated driving force,” P.-H. Leung, K. A. Landsman, C. Figgatt, N. M. Linke, C. Monroe, and K. R. Brown, **Phys. Rev. Lett.** **120**, 020501 (2018).
31. “Demonstration of two-atom entanglement with ultrafast optical pulses,” J. D. Wong-Campos, S. A. Moses, K. G. Johnson, and C. Monroe, **Phys. Rev. Lett.** **119**, 230501 (2017).
32. “Observation of a Many-Body Dynamical Phase Transition in a 53-Qubit Quantum Simulator,” J. Zhang, G. Pagano, P. W. Hess, A. Kyprianidis, P. Becker, H. B. Kaplan, A. V. Gorshkov, Z.-X. Gong, and C. Monroe, **Nature** **551**, 601 (2017).
33. “Complete 3-Qubit Grover Search on a Programmable Quantum Computer,” C. Figgatt, D. Maslov, K. A. Landsman, N. M. Linke, S. Debnath, C. Monroe, **Nature Comm.** **8**, 1918 (2017).
34. “Fault-Tolerant Quantum Error Detection,” N. M. Linke, M. Gutierrez, K. A. Landsman, C. Figgatt, S. Debnath, K. R. Brown, C. Monroe, **Science Advances** **3**, e1701074 (2017).
35. “Multi-Species Trapped Ion Node for Quantum Networking,” I. V. Inlek, C. Crocker, M. Lichtman, K. Sosnova, and C. Monroe, **Phys. Rev. Lett.** **118**, 250502, (2017).
36. “Ultrafast Creation of Large Schrödinger Cat States of an Atom,” K. G. Johnson, J. D. Wong-Campos, B. Neyenhuis, J. Mizrahi, C. Monroe, **Nature Comm.** **8**, 697 (2017).
37. “Experimental Comparison of Two Quantum Computing Architectures,” N. M. Linke, D. Maslov, M. Roetteler, S. Debnath, C. Figgatt, K. A. Landsman, K. Wright, C. Monroe, **Proc. Nat’l Acad. Sci.** **114**, 13 (2017).
38. “Observation of a Discrete Time Crystal,” J. Zhang, P.W. Hess, A. Kyprianidis, P. Becker, A. Lee, J. Smith, G. Pagano, L.-D. Potirniche, A.C. Potter, A. Vishwanath, N.Y. Yao, C. Monroe, **Nature** **543**, 217–220 (2017).
39. “Observation of Prethermalization in Long-Range Interacting Spin Chains,” B. Neyenhuis, J. Smith, A. Lee, P. Richerme, P. Hess, J. Zhang, Z. Gong, A. Gorshkov, and C. Monroe, **Science Advances** **3**, e1700672 (2017).
40. “Engineering Large Stark Shifts for Control of Individual Clock-State Qubits,” A. C. Lee, J. Smith, P. Richerme, B. Neyenhuis, P. W. Hess, J. Zhang, and C. Monroe, **Phys. Rev. A** **94**, 042308 (2016).
41. “Demonstration of a programmable general purpose quantum computer,” S. Debnath, N. M. Linke, C. Figgatt, K. A. Landsman, K. Wright, and C. Monroe, **Nature** **536**, 63 (2016).
42. “Many-body localization in a quantum simulator with programmable random disorder,” J. Smith, A. Lee, P. Richerme, B. Neyenhuis, P. W. Hess, P. Hauke, M. Heyl, D. A. Huse, and C. Monroe, **Nature Physics** doi:10.1038/nphys3783 (2016)..
43. “High resolution adaptive imaging of a single atom,” J. D. Wong-Campos, K. Johnson, B. Neyenhuis, J. Mizrahi, and C. Monroe, **Nature Photonics** **10**, 606 (2016).
44. “Kaleidoscope of quantum phases in a long-range interacting spin-1 chain,” Z.-X. Gong, M. F. Maghrebi, A. Hu, M. Foss-Feig, P. Richerme, C. Monroe, and A. V. Gorshkov, **Phys. Rev. B** **93**, 205115 (2016).
45. “Active Stabilization of Ion Trap Radiofrequency Potentials,” K. G. Johnson, J. D. Wong-Campos, B. Neyenhuis, J. Mizrahi, and C. Monroe, **Rev. Sci. Instrum.** **87**, 053110 (2016).
46. “Simulating the Haldane Phase in Trapped Ion Spins Using Optical Fields,” I. Cohen, P. Richerme, Z.-X. Gong, C. Monroe, A. Retzker, **Phys. Rev. A** **92**, 012334 (2015)..
47. “Sensing Atomic Motion from the Zero Point to Room Temperature with Ultrafast Atom Interferometry,” K. G. Johnson, B. Neyenhuis, J. Mizrahi, J. D. Wong-Campos, C. Monroe, **Phys. Rev. Lett.** **115**, 213001 (2015).
48. “Realization of a Quantum Integer-Spin Chain with Controllable Interactions,” C. Senko, P. Richerme, J. Smith, A. Lee, I. Cohen, A. Retzker, and C. Monroe, **Phys. Rev. X** **5**, 021026 (2015).
49. “Modular Entanglement of Atomic Qubits using both Photons and Phonons,” D. Hucul, I. V. Inlek, G. Vittorini, C. Crocker, S. Debnath, S. M. Clark, and C. Monroe, **Nature Physics**, **11**, 37 (2015).
50. “Entanglement of distinguishable quantum memories,” G. Vittorini, D. Hucul, I.V. Inlek, C. Crocker, and C. Monroe, **Phys. Rev. A** **90**, 040302(R) (2014).
51. “Quantum gates with phase stability over space and time,” I.V. Inlek, G. Vittorini, D. Hucul, C. Crocker, and C. Monroe, **Phys. Rev. A** **90**, 042316 (2014).
52. “Coherent Imaging Spectroscopy of a Quantum Many-Body Spin System,” C. Senko, J. Smith, P. Richerme, A. Lee, W.C. Campbell, and C. Monroe, **Science** **345**, 430 (2014).

53. “Non-local propagation of correlations in long-range interacting quantum systems,” P. Richerme, Z.-X. Gong, A. Lee, C. Senko, J. Smith, M. Foss-Feig, S. Michalakis, A. V. Gorshkov, and C. Monroe, **Nature** 511, 198 (2014).
54. “Large Scale Modular Quantum Computer Architecture with Atomic Memory and Photonic Interconnects,” C. Monroe, R. Raussendorf, A. Ruthven, K. R. Brown, P. Maunz, L.-M. Duan, J. Kim, **Phys. Rev. A** 89, 022317 (2014).
55. “Optimal quantum control of multi-mode couplings between trapped ion qubits for scalable entanglement,” T. Choi, S. Debnath, T. A. Manning, C. Figgatt, Z.-X. Gong, L.-M. Duan, and C. Monroe, **Phys. Rev. Lett.** 112, 19502 (2014).
56. “Beat note stabilization of mode-locked lasers for quantum information processing,” R. Islam, W. C. Campbell, T. Choi, S. M. Clark, S. Debnath, E. E. Edwards, B. Fields, D. Hayes, D. Hucul, I. V. Inlek, K. G. Johnson, S. Korenblit, A. Lee, K. W. Lee, T. A. Manning, D. N. Matsukevich, J. Mizrahi, Q. Quraishi, C. Senko, J. Smith, and C. Monroe, **Optics Letters** 39, 3238 (2013).
57. “Quantum Catalysis of Magnetic Phase Transitions in a Quantum Simulator,” P. Richerme, C. Senko, S. Korenblit, J. Smith, A. Lee, R. Islam, W. C. Campbell, and C. Monroe, **Phys. Rev. Lett.** 111, 100506 (2013).
58. “Quantum Control of Qubits and Atomic Motion Using Ultrafast Laser Pulses,” J. Mizrahi, B. Neyenhuis, K. G. Johnson, W. C. Campbell, C. Senko, D. Hayes, D. Hucul, and C. Monroe, submitted to **Appl. Phys. B** (2013).
59. “Experimental Performance of a Quantum Simulator: Optimizing Adiabatic Evolution and Identifying Many-body Ground States,” P. Richerme, C. Senko, J. Smith, A. Lee, S. Korenblit, and C. Monroe, **Phys. Rev. A** 88, 012334 (2013).
60. “Emergence and Frustration of Magnetism with Variable-Range Interactions in a Quantum Simulator” R. Islam, C. Senko, W. C. Campbell, S. Korenblit, J. Smith, A. Lee, E. E. Edwards, C.-C. Wang, J. K. Freericks and C. Monroe, **Science** 340, 583 (2013).
61. “Ultrafast Spin-Motion Entanglement and Interferometry with a Single Atom,” J. Mizrahi, C. Senko, W. C. Campbell, K. G. Johnson, C. W. S. Conover, C. Monroe, **Phys. Rev. Lett.** 203001 (2013).
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7. “*Scalable Entanglement of Trapped Ions*,” C. Monroe, C. Sackett, D. Kielpinski, B. King, C. Langer, V. Meyer, C. Myatt, M. Rowe, Q. Turchette, W. Itano, and D. Wineland, in *Atomic Physics 17* (AIP, N.Y., 2001), pg 173.
8. “*From Microscopic Towards Mesoscopic: Quantum State Engineering with Cold Trapped Ions*,” B. King, Q. Turchette, C. Myatt, C. Wood, D. Leibfried, D. Kielpinski, W. Itano, C. Monroe, and D. Wineland, in *Mesoscopic and Macroscopic Quantum Phenomena*, ed. by J.R. Friedman and S. Han (Nova, New York, 2000).
9. “*Searches for anomalous interactions using trapped ions*,” D. J. Wineland, J. J. Bollinger, W. M. Itano, J. C. Bergquist, and C. Monroe, in *CPT and Lorentz Symmetry*, proc. of the First Meeting, Indiana University, Bloomington, November 1998, edited by V. A. Kostelecky (World Scientific, Singapore, 1999), p. 87-93.
10. “*Quantum Logic with a Few Trapped Ions*,” C. Monroe, W. Itano, D. Kielpinski, B. King, D. Leibfried, C. Myatt, Q. Turchette, D. Wineland, and C. Wood, *Trapped Charged Particles and Fundamental Physics*, eds. D. Dubin and D. Schneider (American Inst. Phys., 1999), p. 378.
11. “*Trapped ions, Entanglement, and Quantum Computing*,” C. Myatt, B. King, D. Kielpinski, D. Leibfried, Q. Turchette, C. Wood, W. Itano, C. Monroe, and D. Wineland, in *Methods of Ultrasensitive Detection*, SPIE conf. 3270, p. 131 (1998).
12. “*Entangled States of Atomic Ions for Quantum Metrology and Computation*,” D. Wineland, C. Monroe, D. Meekhof, B. King, D. Leibfried, W. Itano, J. Bergquist, D. Berkeland, J. Bollinger, J. Miller, in *Atomic Physics XV* (World Scientific, Singapore, 1997), pg 31.
13. “*Quantum Harmonic Oscillator State Synthesis and Analysis*,” W. Itano, C. Monroe, D. Meekhof, D. Leibfried, B. King, and D. Wineland, in *Atom Optics*, SPIE vol. 2995 (1997).
14. “*Experiments at NIST with Trapped Ions: 3-D Zero-Point Cooling, Quantum Gates, Bragg Scattering, and Atomic Clocks*,” C. Monroe, A. Barton, J. Bergquist, D. Berkeland, J. Bollinger, F. Cruz, W. Itano, S. Jefferts, B. Jelenkovic, B. King, D. Meekhof, J. Miller, M. Poitzsch, J. Tan, and D. Wineland, in *Laser Spectroscopy XII* (World Scientific, 1996), pg. 179.

15. “*Quantum-Mechanically Correlated States and Atomic Clocks*,” C. Monroe, D. Meekhof, B. King, W. Itano, J. Bollinger, and D. Wineland, in *Dark Matter, Clocks, and Tests of Fundamental Laws*, (Editions Frontières, Gif-sur-Yvette, 1995), pg. 391.
16. “*The Low Temperature Road toward Bose-Einstein Condensation in Optically and Magnetically Trapped Cesium Atoms*,” C. Monroe, E. Cornell and C. Wieman, in *Laser Manipulation of Atoms and Ions, Proceedings of the International School of Physics Enrico Fermi* (North Holland, Amsterdam, 1992), pg. 361.
17. “*Fundamental Physics with Optically Trapped Atoms*,” C. Wieman, C. Monroe and E. Cornell, in *Laser Spectroscopy X* (World Scientific, Singapore, 1992), pg. 37.
18. “*Curious Behavior of Optically Trapped Atoms*,” C. Wieman, T. Walker, D. Sesko and C. Monroe, in *Atomic Physics XII* (Am. Instit. Phys., N.Y., 1991), pg. 58.
19. “*Collisional Loss Mechanisms in Light-Force Atom Traps*,” T. Walker, D. Sesko, C. Monroe and C. Wieman, in *The Physics of Electronic and Atomic Collisions XVI* (Am. Instit. Phys., N.Y., 1990), pg. 593.
20. “*Enhanced and Suppressed Visible Spontaneous Emission by Atoms in a Concentric Optical Resonator*,” D. Heinzen, J. Childs, C. Monroe, and M.S. Feld, in *Laser Spectroscopy VIII* (Springer, Heidelberg, 1987), pg. 36.

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Colloquia and Seminars

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| Jun-20, “Quantum Computing with Atoms,” Oxford Quantum Information Society, Oxford, UK | Nov-17, “Quantum Computing with Individual Atoms,” Georgetown Univ., Washington DC |
| Mar-20, “Quantum Information Science,” Technion University, Haifa, Israel | Nov-17, “Time to Build a Quantum Computer,” Univ. Oregon, Eugene OR |
| Dec-19, “Quantum Computing with Atoms,” Duke University, Durham, NC | Jun-17, “Quantum Information Science,” APS, Ridge, NY |
| Nov-19, “Quantum Simulation with Trapped Ions,” University of Texas, Dallas TX | Apr-17, “Time Crystals,” ITAMP - Harvard University, Cambridge, MA |
| Oct-19, “Quantum Computing with Atoms,” University of Minnesota, Minneapolis, MN | Mar-17, “Quantum Simulations of Magnetism,” Penn State Univ., State College PA |
| Aug-19, “Building a Quantum Computer,” SGInnovate Series, Singapore | Mar-17, “Quantum Computing with Atoms,” Penn State Univ., State College PA |
| Aug-19, “Quantum Computing with Ions,” Tsinghua University, Beijing, China | Mar-17, “Quantum Computing,” Abilene Christian University, Abilene TX |
| May-19, “Quantum Computing,” Captial One Bank Technical Lecture, Tysons Corner, VA | Mar-17, “Building a Quantum Computer, Atom by Atom,” MIT, Cambridge, MA |
| Apr-19, “Quantum Computing with Atoms,” Harvard Univ., Cambridge, MA | Feb-17, “Building a Quantum Computer, Atom by Atom,” Indiana University, Bloomington, IN |
| Apr-19, “Quantum Computing with Atoms,” Oak Ridge National Laboratory, Oak Ridge, TN | Feb-17, “Quantum Computing with Atoms and Photons,” Indiana University Purdue Univ, Indianapolis, IN |
| Mar-19, “Quantum Computing with Trapped Ions,” Google, Venice Beach, CA | Dec-16, “Quantum Computing with Atoms” Princeton University, Princeton, NJ |
| Mar-19, “Quantum Computing with Atoms,” Univ. of Amsterdam, Amsterdam, Netherlands | Nov-16, “Quantum Computing with Atoms,” Univ. Maryland, College Park, MD |
| Sept-18, “Quantum Computing with Atoms,” Univ. California, Berkeley, CA | Nov-16, “Quantum Computing with Atoms,” Colorado State Univ., Ft. Collins, CO |
| Jun-18, “Quantum Information Science,” Aspen Center for Physics | Oct-16, “Quantum Networks with Atoms” University of Delft, Netherlands |
| Jan-18, MIT Microsystems Technology Laboratory Invited Speaker, Bretton Woods, NH | Oct-16, “Quantum Networks with Atoms” AFRL, Rome, NY |
| Jan-18, “Quantum Computing,” Argonne National Laboratory Director’s Colloquium, Chicago, IL | June-16, “Quantum Networks with Atoms” University of Ulm, Germany |
| Dec 17, “Quantum Computing with Atoms,” Nanyang Technical University, Singapore | Feb-16, “Quantum Computing and Simulation” Gunnar Källén Lecture, Lund University, Lund, Sweden |
| Nov 17, “Quantum Computing,” University of San Luis Potosi, MX | |

- Feb-16, "Quantum Information with Trapped Ions," University of Chicago, Hyde Park, IL
- Feb-16, "Quantum Networks of Atoms," Neils Bohr Institute, Copenhagen, Denmark
- Jan-16, "Quantum Networks," Ohio State University, Columbus, OH
- Feb-16, "Quantum Networks of Atoms," Duke University, Durham, NC
- Sept-15, "Building A Quantum Computer With Trapped Ions," Quantum Seminar, MIT, Cambridge, MA
- Aug-15, "Quantum Information Science with Atoms," Duke Univ., Durham, NC
- Jun-15, "Building a Quantum Computer with Atoms," IARPA Seminar, Arlington, VA
- May-15 "The Ion Trap Quantum Architecture," Google, Inc., Los Angeles, CA
- Mar-15 "Quantum Networks with Ions," University of Calgary (Calgary, Alberta)
- Jan-15 "Quantum Networks with Ions," University of Wisconsin (Madison, WI)
- Dec-14 "Quantum Networks with Atoms," University of Saarland (Saarbrücken, Germany)
- Nov-14 "Quantum Networks with Atoms," Rice University (Houston, TX)
- Nov-14 "Quantum Networks with Atoms," University of California at Santa Barbara (Santa Barbara, CA)
- Nov-14 "Quantum Networks with Atoms," University of Southern California (Los Angeles, CA)
- Oct-14 "Synthesis of $(Yb^+)_20$ for Quantum Computing," Univ. Maryland Chemistry Dept. (College Park, MD)
- June-14 "Quantum Information Science with Atoms," Army Research Laboratory (Adelphi, MD)
- Feb-14 "Quantum Computing with Trapped Ions," New York University (New York, NY)
- Feb-14 "Quantum Computing with Trapped Ions," New York University (New York, NY)
- Feb-14 "Quantum Computing with Trapped Ions," New York University (New York, NY)
- Jan-14 "Quantum Magnetism from the Bottom Up," CQuIC Seminar, University of New Mexico (Albuquerque, NM)
- Jan-14 "Breaking Quantum Badness," University of New Mexico (Albuquerque, NM)
- Jan-14 "Breaking Bad Ion Traps," Sandia National Labroatory (Albuquerque, NM)
- Nov-13 "Quantum Networks of Atoms," Syracuse University (Syracuse, NY)
- Oct-13 "Magnetism from the Bottom Up," Harvard CUA Seminar (Cambridge, MA)
- May-13 "Magnetism from the Bottom Up," ETH - Swiss Federal Inst. of Technology (Zurich, Switzerland)
- Mar-13 "Magnetism from the Bottom Up," University of Pittsburgh (Pittsburgh, PA)
- Sept-12 "Quantum Simulation of Interacting Spins," Yale University (New Haven, CT)
- Apr-12 "Quantum Networks with Trapped Ions," SUNY (Stonybrook, NY)
- Mar-12 "Quantum Networks with Atoms," Weizmann Institute (Rehovot, Israel)
- Mar-12 "Quantum Simulations of Magnetism," UCLA (Los Angeles, CA)
- Mar-12 "Quantum Information Science," Pomona College (Claremont, CA)
- Feb-12 "Quantum Simulations of Magnetism with Trapped Ions," Univ. Colorado (Boulder, CO)
- Jan-12 "Quantum Networks with Atomic Memories," CalTech (Pasadena, CA)
- Nov-11 "Quantum Information Science," Washington-Virginia IEEE Optics Section (College Park, MD)
- Oct-11 "Quantum Networks with Trapped Atomic Ions," TU Delft (Delft, Netherlands)
- Oct-11 "Quantum Simulation of Magnetism with Atoms," Univ. Utrecht (Utrecht, Netherlands)
- Sept-11 "Quantum Simulation of Magnetism with Atoms," Stevens Institute of Technology (Hoboken, NJ)
- Mar-11 "Quantum Control of Atoms," Harvard University (Cambridge, MA)
- Jan-11 "Quantum Information Science," Gettysburg College (Gettysburg, PA)
- Jan-11 "Quantum Networks," University of British Columbia (Vancouver, BC)
- Jan-11 "Quantum Networks," Simon Fraser University (Burnaby, BC)
- Jan-11 "Quantum Networks with Atoms and Photons," Ohio State University (Columbus, OH)
- Oct-10 "Quantum Computation and Communication," Naval War College (Newport, RI)
- May-10 "Quantum Networks of Atoms, Phonons, and Photons," University of Washington (Seattle, WA)
- Mar-10 "Quantum Computing with Atoms," George Washington University (Washington, DC)
- Mar-10 "Quantum Networks of Atoms, Phonons, and Photons," Duke University (Durham, NC)
- Feb-10 "Quantum Networks of Atoms, Phonons, and Photons," Notre Dame University (South Bend, IN)
- Nov-09 "Quantum Networks with Atoms, Phonons, and Photons," MIT-Harvard Center for Ultracold Atoms (Cambridge, MA)
- Sept-09 "Quantum Networks with Atoms, Phonons, and Photons," Univ. Maryland Baltimore County (Catonsville, MD)
- Jul-09 "Quantum Information with Individual Atoms," Northrup-Grumman (Linthicum, MD)
- Apr-09 "Atomic Teleportation and Quantum Networks," Univ. Illinois (Champaign, IL)
- Mar-09 "Trapped Ion Quantum Networks," Inst. for Quant. Comp, Univ. Waterloo (Waterloo, Ont.)
- Mar-09 "Trapped Ion Quantum Networks," York University (York, Ont.)
- Feb-08 "Quantum Networks with Atoms and Photons," Univ. California (Berkeley, CA)
- Feb-08 "Trapped Ion Quantum Networks," LANL Quantum Seminar (Los Alamos, NM)

Oct-08 "Trapped Ion Quantum Networks," University of Delaware (Newark, DE)

Oct-08 "Quantum Information," NSF Distinguished Lecture Series (Arlington, VA)

Sept-08 "Trapped Ion Quantum Networks," Army Research Laboratory (Adelphi, MD)

Sept-08 "Quantum Computing with Trapped Ions," Stevens Inst. of Tech. (Hoboken, NJ)

July-08 "Trapped Ion Quantum Networks," Max Planck Inst. for Quantum Optics (Garching, Germany)

July-08 "Trapped Ion Quantum Networks," University of Innsbruck and IQOQI (Innsbruck, Austria)

Apr-08 "Quantum Networks and Atomic action-at-a-distance," Michigan Tech. Univ. (Houghton, MI)

Mar-08 "Quantum Computing with Atoms and Photons," Univ. Central Florida (Orlando, FL)

Feb-08 "Quantum Networks with Atoms," Purdue Univ. (Lafayette, IN)

Feb-08 "Integrated Atomic Quantum Networks," Sandia National Laboratory (Albuquerque, NM)

Feb-08 "Quantum Networks with Atoms," Univ. New Mexico (Albuquerque, NM)

Dec-07 "Quantum Networks and Atomic action-at-a-distance," Univ. Maryland (College Park, MD)

Dec-07 "Quantum Networks and Atomic action-at-a-distance," Penn. State Univ. (State College, PA)

Mar-07 "Quantum Information and Quantum Control," Princeton University (Princeton, NJ)

Feb-07 "Quantum Computing with Atoms and Photons," Drexel University (Philadelphia, PA)

Feb-07 "Quantum Computing with Atoms and Photons," Miami University (Miami, OH)

Dec-06 "Quantum Computing with Atoms and Photons," Kansas State University (Manhattan, KA)

Nov-06 "Quantum Computing with Atoms and Photons," Iowa State University (Ames, IA)

Nov-06 "Quantum Computers," Albion College (Albion, MI)

Sept-06 "Quantum Information Networking with Atoms and Photons," Williams College (Williamstown, MA)

Sept-06 "Quantum Computing" Hamilton College (Clinton, NY)

Sept-06 "Quantum Information Networking with Atoms and Photons," SUNY-Stonybrook (Stonybrook, NY)

June-06, "Quantum Computing with Atoms," University of Chicago (Chicago, IL)

May-06, "Quantum Networking with Trapped Atomic Qubits," Stanford University (Palo Alto, CA)

Feb-06, "Quantum Networking with Trapped Ions," Michigan State University (East Lansing, MI)

Jan-06, "Quantum Networking with Trapped Ions," MPQ Director's Seminar (Garching, Germany).

Dec-05, "The 2nd Quantum Revolution: Einstein in the 21st Century," Univ. Michigan (Ann Arbor, MI)

Nov-05, "Advanced Ion Traps and Ultrafast Quantum Gates" Harvard/MIT CUA (Cambridge, MA)

Sept-05, "Quantum Computing with Individual Atoms," Grinnell College (Grinnell, IA)

Apr-05, "Quantum Computing with Atoms & Photons," Univ. Maryland (College Park, MD)

Apr-05, "Quantum Networks with Atoms and Photons," Univ. Windsor (Windsor, Ont, Canada)

Feb-05, "Microscale Ion Traps for Quantum Information," Sandia Nat'l Lab. (Albuquerque, NM)

Oct-04, "Quantum Computing and Communication with Atoms& Photons," Washington Univ. (St. Louis, MO)

Apr-04, "Atom-photon entanglement: the best of both quantum worlds," Univ. Michigan (Ann Arbor, MI)

Nov-03, "Entanglement between a single atom and photon," University of Illinois (Champaign, IL)

Nov-03, "Quantum Computing with Individual Atoms," University of Buffalo (Buffalo, NY)

Oct-03, "Quantum Computing and Schrodinger's Cat," St. Cloud State (St. Cloud, MN)

Apr-03, "Quantum Computing with Trapped Ions," University of Connecticut (Storrs, CT)

Apr-03, "Quantum Computation and Schrodinger's Cat," University of North Carolina (Wilmington, NC)

Dec-02, "Quantum Information and the Individual Atom," University of Michigan (Ann Arbor, MI)

Nov-02, "Quantum Computation and Schrodinger's Cat," Georgia Tech (Atlanta, GA)

Nov-02, "Quantum Computing with individual atoms," Rhodes College (Memphis, TN)

Sept-02, "Quantum Computing with individual atoms," Wayne State University (Detroit, MI)

May-02, "Control of Trapped Ions for Quantum Information Science," MIT (Cambridge, MA)

May-02, "Quantum Computers," St. Olaf College Annual Science Symposium (Northfield, MN)

Apr-02, "Quantum Computing with individual atoms," Western Illinois University (Macomb, IL)

Mar-02, "Storing quantum information in individual atoms," Lucent Dist. Lect. Series (Ann Arbor, MI)

Nov-01, "Quantum Computers and Schrodinger's Cat," University of Virginia (Charlottesville, VA)

Nov-01, "Quantum Computing with Individual Atoms," William and Mary (Williamsburg, VA)

Apr-01, "Quantum Computers," University of Toledo (Toledo, OH)

Mar-01, "Bell Inequality Violations with Perfect Detectors," Harvard University (Cambridge, MA)

Feb-01, "Quantum information Science," Calvin College (Grand Rapids, MI)

Nov-00, "Quantum Computing with Trapped Ions," University of Texas (Austin, TX)

Oct-00, "Negative Probabilities and the Wigner Function," University of Michigan (Ann Arbor, MI)

Oct-00, "Quantum Computing with individual atoms," Argonne National Laboratory (Argonne, IL)

Apr-00, "Quantum Computing with Trapped Ions," Univ. of New Mexico (Albuquerque, NM)

- Apr-00, "Entanglement of Four Particles," Santa Fe Institute (Santa Fe, NM)
- Mar-00, "Quantum Information Science," Florida Atlantic Univ. (Boca Raton, FL)
- Mar-00, "Entanglement of Trapped ions and Quantum Computing," Univ. of Michigan (Ann Arbor, MI)
- Feb-00, "Quantum Computation," Amherst College "What's New in Physics" colloquium (Amherst, MA)
- Feb-00, "Entanglement and Quantum Information Science," Yale University (New Haven, CT)
- Jan-00, "Trapped Ion Quantum Computing," University of Rochester (Rochester, NY)
- Oct-99, "Control of Trapped Ions for Quantum Computing," Univ. California (Berkeley, CA)
- May-99, "The Ion Trap Quantum Computer," National Security Agency (Fort Meade, MD)
- Apr-99, "Negative Probabilities, Quantum Entanglement, Schrodinger's Cat," Univ. California (San Diego, CA)
- Feb-99, "Quantum Logic Gates with Individual Atoms," Colorado State University (Fort Collins, CO)
- Dec-98, "Quantum Computing and Schrodinger's Cat," Rice University (Houston, TX)
- Oct-98, "Negative Probabilities, Quantum Entanglement, Schrodinger's Cat," Indiana Univ. (Bloomington, IN)
- Sept-98, "Nonclassical States of the Harmonic Oscillator," Stanford University, Stanford, CA
- Jul-98, "On-demand Entanglement for Quantum Info. Science," Ecole Normal Supérieure (Paris, France)
- Mar-98, "Negative Probabilities," Photonics Research Ontario (Toronto, ONT)
- Mar-98, "Quantum Computing and Schrodinger's Cat," University of Toronto (Toronto, ONT)
- Dec-97, "Quantum Entanglement and its Uses," University of Rochester (Rochester, NY)
- Nov-97, "Quantum Computing," University of Washington (Seattle, WA)
- Nov-97, "Negative Probabilities and Wigner Functions," University of Colorado, JILA (Boulder, CO)
- Mar-97, "Quantum Computing," Michigan State University (East Lansing, MI)
- Jan-97, "Quantum Computing with Trapped Atoms," University of Michigan (Ann Arbor, MI)
- Jan-97, "Negative Probabilities, Quantum Entanglement, Schrodinger's Cat," Univ. of Wisc. (Madison, WI)
- Nov-96, "Quantum Information Science," Northwestern University (Evanston, IL)
- Oct-96, "Quantum Computing with Individual Atoms," University of Illinois (Champaign, IL)
- Oct-96, "Quantum Information, Schrodinger's Cat, and All That," MIT Dept. of Physics (Cambridge, MA)
- Oct-96, "Quantum Information Science," University of Florida (Gainesville, FL)
- Sept-96, "Quantum Computing," University of Wyoming (Laramie, WY)
- Aug-96, "Quantum Gates with Trapped Atomic Ions," University of California (Santa Barbara, CA)
- May-96, "Quantum Entanglement and Quantum Optics," Rocky Mountain Optical Soc. (Boulder, CO)
- Feb-96, "Quantum Computing with Individual Atoms," University of Colorado (Boulder, CO)
- Nov-95, "The Ion Trap Quantum Computer," IBM Almaden Labs (San Jose, CA)
- Jul-95, "Trapped Ion Tricks," Los Alamos National Lab. (Los Alamos, NM)
- Mar-95, "Demonstration of a Quantum Logic Gate," California Institute of Tech. (Pasadena, CA)
- Feb-95, "Entangling Quantum Logic Gates with Trapped Ions," University of Connecticut (Storrs, CT)
- Feb-95, "Demonstration of a Quantum Logic Gate," IBM Watson Laboratory (Yorktown Hts, NY)
- Feb-94, "Interactions between Cold Ions and Atoms," University of Illinois at Chicago (Chicago, IL)

Invited Presentations at Meetings (including presentations by group members)

- Feb-20, Quantum Physics Workshop, Texas A&M University, College Station, TX
- Jan-20, Roy Glauber Memorial Symposium, Harvard University, Cambridge, MA
- Jan-20, Physics of Quantum Electronics, Snowbird, UT
- Nov-19, GoogleX workshop on "Quantum Gravity in the Lab," Mountain View, CA
- Nov-19 Novo Nordisk workshop on Quantum Technologies, Copenhagen Denmark
- Nov-19 "Falling Walls" Conference, Berlin, Germany
- Oct-19 ITAMP workshop on manybody physics with ions, Cambridge, MA
- Sept-19, QION Workshop, Tel Aviv, Israel (**N. Linke**)
- June-19, McKinsey T30 Disruptive Technologies Workshop, Calistoga, CA
- May-19, KITP Workshop on Open Quantum Systems, Santa Barbara, CA
- Apr-19, Workshop on "Engineering Scalable Quantum Information Processors," Bad Honnef, Germany
- Apr-19, "Quantum Computing with Atomic Ions," QIM2019, Rome, Italy
- Mar-19, Solvay Meeting on Quantum Simulations, Brussels, Belgium
- Jan-19, Heraeus Meeting on "Scalable Q Hardware Platforms," Bad Honnef, Germany
- Jan-19, Physics of Quantum Electronics, Snowbird, UT
- Dec-18, Quantum 2 Business 2018, Mountain View, CA
- Oct-18, MIT NanoCenter Inaugural Symposium
- Sept-18, EMTEC Conference, MIT Media Laboratory, Cambridge, MA
- Aug-18, INQNET Symposium, AT&T Foundry, Palo Alto, CA
- Jul-18, Gordon Research Conference on Quantum Information Science, Stonehill College, MA

Jun-18, Quantum Computing Program, Simons Institute, Berkeley, CA
 May 18, Monte Verita meeting on “Quantum Science and Technology,” Ascona, Switzerland
 May 18, Feynman Centenary Symposium, California Institute of Technology
 Apr 18, National Academy of Sciences Annual Meeting, Washington DC
 Apr 18, New York City Quantum Symposium, NYU, New York, NY
 Mar 18, Quantum Information and Nuclear Physics, Argonne National Laboratory, IL
 May 18, CalTech Feynman Centenary Festival, Pasadena, CA
 May 18, DOE Fusion Energy Science Workshop on Quantum Information, Gaithersburg, MD
 Apr 18, National Academy of Sciences Annual Meeting, Washington DC
 Apr 18, APS April Meeting, Plenary Talk on the Feynman Centenary, Columbus, OH
 Mar 18, DOE Nuclear Physics Workshop on Quantum Information, Argonne National Laboratory
 Mar 18, Workshop on Nonequilibrium Quantum Systems, Stellenbosch, South Africa
 Dec 17, Workshop on Quantum Physics with Trapped Particles, Guangzhou, China
 Dec 17, Center for Quantum Technology 10th Anniversary Symposium, Singapore
 Nov 17, NASA Workshop on Quantum Computing, Langley AFB, VA
 Oct 17, US Dept. of Energy workshop on Quantum Computing Devices and Hardware, Gaithersburg, MD
 Oct 17, US Dept. of Energy workshop on Quantum Chemistry Applications, Gaithersburg, MD
 Oct-17, Workshop on “Long-Range Interacting Systems,” Bad-Honnef, Germany (**G. Pagano**)
 Oct 17, Hudson Institute workshop on Cybersecurity and Quantum Computing, Washington DC
 Oct 17, Government Accountability Office meeting on Quantum Computing and Synthetic Biology, Washington DC
 Oct 17, IEEE Emerging Technology Symposium, IBM-Yorktown, NY
 Sept 17, Heidelberg Laureates Meeting, Heidelberg, Germany
 Sept 17, Quantum Repeater Workshop, Seefeld, Austria
 Sept 17, Quantum Error Correction Conference, College Park, MD (**N. Linke**)
 Aug 17, DARPA Workshop on Nonequilibrium quantum phases, Arlington, VA (**J. Zhang**)
 July 17, OCPA9, Beijing, China
 July 17, Quantum Optics to Quantum Technology Workshop, Royal Society of London, London, UK
 July 17, NYU Quantum Symposium, New York, NY
 Jun 17, APS DAMOP meeting, Sacramento, CA
 Jun 17, APS DAMOP meeting, “Programmable Quantum Comp.,” Sacramento, CA (**S. Debnath**)
 Jun 17, APS DAMOP meeting, “Fault Tolerance with Trapped Ion Qubits,” Sacramento, CA (**N. Linke**)
 Feb-17, The Royal Society, Workshop on the Breakdown of ergodicity in quantum systems (**P. Hess**)
 Jan-17, US Dept. of Energy Quantum Testbed Workshop, Washington DC
 Nov-16, KITP workshop on thermalization and many body localization, Santa Barbara, CA (**P. Hess**)
 Dec-16, conference on Quantum Simulations, Hsinchu, Taiwan (**G. Pagano**)
 Aug-16, 4th European Conference on Trapped Ions (ECTI), Arosa, Switzerland
 July-16, Int’l Conf. Atomic Physics (ICAP), Seoul, Korea
 July-16, Seoul Conf. on Frontiers of Quantum Information Science, Seoul, Korea
 June-16, Itzykson Conference on Quantum Many Body Systems, Saclay, France
 May-16, Symposium in Honor of Paul Benioff, Argonne National Laboratory, Argonne, IL
 Apr-16, Hamamatsu Quantum Optics Workshop, Hamamatsu, Japan
 Jan-16, Center for Ultracold Atoms, Winter Retreat, Plymouth, NH
 Dec-15, IBM ThinkQ Workshop on few-qubit Quantum Computers, Yorktown Heights, NY
 Nov 15, KITP Workshop on Many Body Localization, Santa Barbara, CA
 Oct 15, APS Mid-Atlantic Regional Annual Meeting, Plenary Speaker, Morgantown, WV
 Oct 15, Purdue Quantum Center Kickoff Workshop, West Lafayette, IN
 Oct 15, Frontiers in Quantum Information and Computer Science, QuICS Center, College Park, MD
 Sept 15, UK Quantum Hubs Annual Meeting, Oxford, UK
 Sept 15, US-Japan 12th Workshop on Quantum Electronics and Laser Spectroscopy, Madison, WI
 Sept 15, Workshop on Synthetic Magnetism, Max Planck Institute for Condensed Matter, Dresden, Germany
 Jun 15, Trustworthy Quantum Information Workshop, Univ. Michigan, Ann Arbor, MI
 Jun 15, International Conference on Rydberg Atoms, Durham, United Kingdom (**B. Neyenhuis**)
 Jun 15, APS DAMOP meeting, “Controlling Atomic Qubits with Lasers and Photon,” Columbus, OH
 Jun 15, ETH Workshop, “Quantum Magnetism with Trapped Ions,” Monte Verita, Switzerland (**P. Richerme**)
 May 15, KITP workshop on “Entanglement in Strongly-Correlated Quantum Matter,” Santa Barbara, CA
 Apr 15, SPIE meeting on Defense, Security, and Sensing, Baltimore, MD
 Jan-15, Center for Ultracold Atoms, Winter Retreat, Plymouth, NH

Jan-15, "Building a Modular Quantum Computer with Trapped Ions," SQUINT meeting, Berkeley, CA

Dec 14, Workshop on Many-Body Quantum Systems, Bad Honnef, Germany

Nov 14, US-Korea Workshop on Quantum Information Science, Los Angeles CA

Oct 14, Quantum Optics VII (QO14), Mar del Plata, Argentina

Oct 14, Workshop on Quantum Dynamics in Many-body Atomic Systems, Glasgow, Scotland

Sept 14, Workshop on Long-Range Interacting Atomic Systems, Palaiseau, France

July-14, Int'l Conf. Atomic Physics (ICAP), Washington DC (**P. Richerme**)

July-14, Gordon Conference on Quantum Science, Stonehill, MA (**C. Senko and C. Monroe**)

July-14, Int'l Conf. Atomic Physics (ICAP), Washington DC (**P. Richerme**)

June-14, Adiabatic Quantum Computing (AQS-IV), Los Angeles CA

June-14, APS Division of AMO Physics annual meeting, Madison, WI (**C. Senko and B. Neyenhuis**)

Mar 14, Workshop on Quantum Information and Dynamics in Ion Traps (QION-14), Cartagena, Spain

Mar-14, Workshop on Manybody Localization, Princeton University, NJ

Mar-14, Harvard-ITAMP, Workshop on "Quantum Complexity," Cambridge, MA

Sept-14, Workshop on Quantum Simulations, Benasque, Spain

Sept-13, Harvard-ITAMP, Workshop on "Quantum Applications with Trapped Ions," Cambridge, MA (**P. Richerme**)

Aug-13, Conference on Quantum Information and Quantum Control, Univ. Toronto, Toronto, Ontario

Aug-13, Gordon Conference on Quantum Control, Mt. Holyoke College, MA (**B. Neyenhuis**)

Aug-13, Gordon Conference on Atomic Physics, Salve Regina College, RI

July-13, Quantum Information Processing and Computing Conference (QIPC) 2013, Florence, Italy (**S. Clark**)

June-13, APS Division of AMO Physics annual meeting, Quebec, Canada (**C. Senko**)

June-13, Tenth Rochester Conference on Coherence and Quantum Optics, Rochester, NY

Apr-13, Workshop on Quantum Information and Dynamics in Ion Traps (QION-13), Obergurgl, Austria (**C. Senko**)

Mar-13, Conference on Adiabatic Quantum Computing, London, UK (**Phil Richerme**)

Feb-13, Southwestern Quantum Information Network, S. Barbara, CA (**Phil Richerme, Brian Neyenhuis**)

Oct-12, Symposium on Quantum Foundations, University of Maryland

Oct-12, Workshop on Quantum Simulations, Bilbao, Spain (**C. Senko**)

Sept-12, Workshop on QIS in Computer and Natural Sciences, University of Maryland

Sept-12, Royal Society International Scientific Seminar on Quantum Enhancements in Technology (Oxford, UK)

Sept-12, 2nd European Conference on Trapped Ions (ECTI), Obergurgl, Austria

Aug-12, Int'l Conf. on Quantum Foundation and Technology (ICQFT), Dunhuang, China

Aug-12, Gordon Conference on Quantum Science, Mt. Holyoke College, MA

July-12, Int'l Conf. Atomic Physics (ICAP), Palaiseau, France

June-12, Quantum Foundations and Experiment, Vaxjo, Sweden (**S. Clark**)

June-12, APS Division of AMO Physics annual meeting, Anaheim, CA (**R. Islam**)

May-12, IonTech: Techniques for Trapped Ions, Siegen, Germany (**D. Hayes**)

Mar-12, Workshop on Quantum Information and Dynamics in Ion Traps (QION-12), Tel Aviv, Israel

Mar -12, 1st Workshop on Adiabatic Quantum Comp., Sandia National Laboratory, Albuquerque, NM (**E. Edwards**)

Feb-12, International Conference on Quantum Optics, Obergurgl, Austria

Oct-11, Workshop on Solid State Implementation of Quantum Information Hardware, Princeton, NJ

Oct-11, Netherlands Physical Society Annual Meeting, Lunteren, Netherlands

Oct-11, Fitzpatrick Optics Institute Annual Symposium, Duke University, Durham NC

Oct-11, OSA meeting on Frontiers in Optics (FiO), San Jose, CA (**S. Clark**)

Sept-11, Quantum Information Processing and Communication (QIPC), Zurich, Switzerland

June-11, International Conference on Laser Spectroscopy ICOLS, Hannover, Germany (**W. Campbell**)

May-11, European Workshop on Quantum Science and Technology, Trento, Italy

May-11, German National Academy of Sciences Workshop on Quantum Technologies, Munich, Germany

Mar-11, APS March Meeting, Dallas TX

Mar-11, Workshop on Quantum Simulations, Benasque, Spain (**E. Edwards**)

Feb-11, Ion Trap Technology Workshop, Boulder, CO

Feb-11, Southwestern Quantum Information Network, Boulder, CO (**K. Kim**)

Dec-10, Workshop on Foundations and Applications of Quantum Science, Univ. Vienna (Vienna, Austria)

Sept-10, 1st European Ion Trap Workshop, Durham, UK

Sept-10, Workshop on Quantum Decoherence, Benasque, Spain

May-10, APS Division of AMO Physics annual meeting, Houston, TX (**S. Olmschenk, K. Kim, D. Hayes**)

May-10, CLEO/QELS, San Jose, CA

Mar-10, APS March Meeting, Portland, OR
Feb-09, Southwestern Quantum Information Network, Seattle, WA (**D. Hayes**)
Oct-09, OSA Annual Meeting – Frontiers in Optics, San Jose, CA (**P. Maunz**)
Sep-09, Quantum Information Processing and Computing (QIPC), Rome, Italy
Aug-09, Conference on Quantum Information and Quantum Control, Univ. Toronto, Toronto, Ontario
July-09, Atomic Physics Gordon Conf., Tilton, NH
May-09, CLEO/IQEC, Baltimore, MD (**D. Hayes**)
May-09, CLEO/IQEC, Baltimore, MD (**K. Kim**)
May-09, APS Division of AMO Physics annual meeting, Charlottesville, VA (**D. Matsukevich**)
Mar-09, German Physical Society annual meeting (**P. Maunz**)
Feb-09, Southwestern Quantum Information Network, Seattle, WA
Feb-09, 2nd Workshop on Integrated Atomic Systems (IAS II), Seattle, WA (**S. Olmschchenk**)
Feb-09, Quantum Information with Atoms, Ions and Photons (EU Network Workshop), Cortina, Italy
Nov-08, ITAMP Workshop on Open Quantum Systems, Cambridge, MA
Aug-08, Gordon Conference on Quantum Information Science, Big Sky, MT (**D. Matsukevich**)
May-08, APS Division of AMO Physics Annual Meeting, State College, PA (**D. Moehring, Thesis Prize**)
May-08, Quantum Electronics and Laser Science (QELS), San Jose, CA (**D. Matsukevich**)
Feb-08, Ultrafast and Ultracold Processes, Kibbutz Ein Gedi, Israel (**P. Maunz**)
Nov-07, Workshop on Integrated Atomic Systems, Georgia Tech (Atlanta, GA)
Sept-07, NEC Workshop on Quantum Communication (Princeton, NJ)
Aug-07, Quantum Enabled Science and Technology (QUEST), Santa Fe, NM (**D. Stick**)
Jul-07, Gordon Conference on Quantum Control, Salve Regina College, RI
Jun-07, APS Division of AMO Physics Annual Meeting, Calgary, Alberta
Jun-07, Workshop on Quantum Engineering with Neutral Atoms and Light, Herrsching, Germany (**P. Maunz**)
Jun-07, Workshop on Fault-Tolerant Quantum Error Correction, Perimeter Institute, Waterloo, Ont.
Jun-07, International Conference on Quantum Information, Rochester, NY
May-07, Harvard-Smithsonian ITAMP Workshop of Hybrid Quantum Information, Cambridge, MA
May-07, Plenary Speaker, US-Canada Cross Border Workshop, Toronto, Ontario
Apr-07, Gordon Conference on Quantum Information Science, Pisa, Italy
Mar-07 “Quantum Networking with Atoms & Photons,” JQI Symposium, College Park, MD
Mar-07, APS March Meeting, Denver, CO
Mar-07, Int’l Workshop on Measurement-Based Quantum Computing, Oxford, UK (**D. Moehring**)
Feb-07, CIAR Conference on Quantum Simulations, Vancouver, BC
Nov-06, IEEE-LEOS Annual Meeting, Montreal, Canada (**P. Maunz**)
Aug-06, Quantum Enabled Science and Technology (QUEST), Santa Fe, NM (**D. Moehring**)
Aug-06, “The Principles and Applications of Control in Quantum Systems,” Harvard Univ., Cambridge, MA
July-06, IEEE-LEOS Topical on Quantum Communication Networks, Quebec City, Canada
Feb-06, Workshop on “Decoherence at the Crossroads,” Vancouver, BC Canada (**L. Deslauriers**)
Feb-06, 2nd Int’l Workshop on Trapped Ion Quantum Computing, Boulder, CO
Feb-06, Southwestern Quantum Information Technology Annual Meeting, Albuquerque, NM (**P. Maunz**)
Nov-05, Hereaus Workshop: “The Photon–Generation, Detection and Application,” Cologne, Germany
Nov-05, Midwestern Cold Atom Workshop, Champaign, IL (**Kathy-Anne Brickman**)
Nov-05, ARO-Harvard Workshop on Quantum Repeaters, Cambridge, MA
Oct-05, Optical Society of America Annual Meeting, Tucson, AZ (**M. Madsen, P. Lee**)
Aug-05, Quantum Enabled Science and Technology (QUEST), Santa Fe, NM (**L. Deslauriers**)
Jun-05, Gordon Conference on Atomic Physics, Tilton, NH (**P. Haljan**)
Jul-05, Hereaus Workshop: “Control of quantum correlations in tailored matter,” Germany (**W. Hensinger**)
May-05, Quantum Physics of Nature: Theory, Experiment, and Interpretation, Vienna, Austria
May-05, APS Division of AMO Physics Annual Meeting, Lincoln, NE
Mar-05, Gordon Conference on Quantum Information Science, Ventura, CA (**P. Lee**)
Dec-04, National Academy of Sciences Frontiers of Science, “Quantum Metrology,” Irvine, CA
Sept-04, Isaac Newton Programme on Quantum Information Theory, Cambridge, UK
Aug-04, Neils Bohr Symposium on Quantum Optics, Copenhagen, DK
Aug-04, Quantum Enabled Science and Technology (QUEST), Santa Fe, NM (**P. Haljan**)
Aug-04, 2nd Feynman Festival, College Park, MD (**W. Hensinger**)
Jun-04, FOCUS Workshop on Coherent Control Comp. Devices, Ann Arbor, MI
May-04, 1st Int’l Workshop on Trapped Ion Quantum Computing, Ann Arbor, MI
May-04, APS Division of AMO Physics annual meeting, Tucson, AZ (**B. Blinov**)
May-04, Harvard-Smithsonian ITAMP Mesoscopic Physics Workshop, Cambridge, MA

Apr-04, NIST Quantum Information Science and Emerging Technologies, Boulder, CO
 Mar-04, QUEST European Network on Atoms/Ions as Qubits, Torino, Italy (**P. Haljan**)
 Dec-03, European Union Focus Meeting on Few-Qubit Applications, Budmerice, Slovakia
 Oct-03, Optical Society of America Annual Meeting, Tucson, AZ (**P. Haljan**)
 Aug-03, Quantum Enabled Science and Technology (QUEST), Santa Fe, NM (**B. Blinov**)
 Jul-03, European Network Meeting: Quantum Information Processing and Communication (QUIPC), Oxford, UK
 Jun-03, Discussion Leader, Gordon Conference on Atomic Physics, Tilton School, NH
 Jun-03, THINQC – NSA/ARDA Workshop on Theory in Quantum Computing, Harper’s Ferry, WV
 May-03, Quantum and Reversible Computation, Stony Brook, NY
 May-03, Quantum Electronics and Laser Science, Baltimore, MD
 Apr-03, APS Ohio Section Meeting, East Lansing, MI
 Mar-03, Discussion Leader, Inaugural Gordon Conference on Quantum Information, Ventura, CA
 Oct-02, External Invited Speaker, DOE Basic Energy Sciences Annual Meeting, Washington, DC
 Oct-02, Optical Society of America Annual Meeting, Orlando, FL (**B. Blinov**)
 Aug-02, Michigan Center for Theoretical Physics Wkshop on Quantum Decoherence, Ann Arbor, MI
 Aug-02, Trapped Particles and Fundamental Interactions, Munich, Germany (**B. Blinov**)
 Aug-02, Decoherence Control and Quantum Computing Workshop, Ann Arbor, MI
 Jun-02, Neutral Atom Quantum Computing Workshop, NIST, Gaithersburg, MD
 May-02, US-Canadian Cross-Border Workshop on Laser Science, Rochester, NY
 Apr-02, Quantum Institute Inaugural, Michigan State University, East Lansing, MI
 Mar-02, “Science and Ultimate Reality” symposium in honor of John A. Wheeler, Princeton, NJ
 Nov-01, APS Southeastern Section Meeting, Charlottesville, VA
 Jul-01, Quantum Applications Symposium, Ann Arbor, MI
 Jul-01, Quantum Communication Measurement & Computing, Capri, Italy
 Jun-01, National Academy of Sciences “Frontiers of Science,” Bad Homburg, Germany
 Jun-01, APS Division of AMO Physics Annual Meeting, London, ONT
 Jun-00, International Conference on Atomic Physics, Florence, Italy
 Sept-99, NIST Director’s Workshop on Cryptography, Gaithersburg, MD
 Jul-99, Gordon Conference on Atomic Physics, Plymouth, NH
 May-99, Quantum Electronics and Laser Science, Baltimore, MD
 Sept-98, Trapped Charged Particles and Fundamental Physics, Monterey, CA
 Jul-98, Workshop on Quantum Computing, Benasque, Spain
 Jun-98, Workshop on Quantum Control, Albuquerque, NM
 May-98, SPIE Aerosense meeting, Orlando, FL
 Nov-97, National Academy of Science “Frontiers of Science”, Irvine, CA
 Oct-97, Optical Society of America Annual Meeting, Long Beach, CA
 Aug-97, Harvard University Dept. of Physics and Smithsonian ITAMP, Cambridge, MA
 Jul-97, Gordon Conference on Nonlinear Optics, Colby-Sawyer, NH
 May-97, German Science Foundation (DFG) “Schwerpunktprogramm”, Bonn, Germany
 May-97, Quantum Control Workshop, Albuquerque, NM
 Mar-97, SPIE Optics in Computing, Incline Village, NV
 Feb-97, AAAS Annual Meeting, Seattle, WA
 Sept-96, European Science Foundation Quantum Optics Meeting, Castelvecchio, Italy
 Jun-96, Quantum Electronics and Laser Science, Anaheim, CA
 May-96, APS Division of AMO Physics Annual Meeting, Ann Arbor, MI
 Oct-95, DARPA “ULTRA” Electronics Meeting, Boulder, CO
 Sept-95, Optical Society of America Annual Meeting, Portland, OR
 Jun-95, Twelfth International Conference on Laser Spectroscopy, Capri, Italy
 Apr-95, American Chemical Society Annual Meeting, Anaheim, CA
 Jan-95, Rencontres de Moriond, Villars, Switzerland
 Apr-92, Quantum Electronics and Laser Science, Anaheim, CA

Lecture Series, Tutorials, Physics Schools

July-20, Boulder Summer School on Condensed Matter Physics, Boulder CO
 June-19, Quantum Information Summer School, Los Alamos National Laboratory, Los Alamos, NM
 June-17, Quantum Science Summer School (QS3), Johns Hopkins University, Baltimore, MD
 Jan-17, ITAMP Winter School on Quantum Information Fundamentals and Applications, Biosphere, AZ
 July-16, International Conference on Atomic Physics (ICAP), Seoul, Korea
 July-16, Les Houches International School of Physics, Les Houches, France
 Aug-12, Tsinghua University Quantum Summer School, Beijing, China

June-12, Institute for Quantum Computing Summer School on Quantum Information, Waterloo, Ont, Canada
 June-12, APS Division of AMO Physics Annual Meeting Graduate Symposium, Anaheim, CA
 May-12, Univ. Michigan 3rd Summer School on Quantum Physics, Ann Arbor, MI
 Sept-11, Vienna Quantum Center Summer School, Vienna, Austria
 Aug-10, Univ. Michigan 2nd Summer School on Quantum Physics, Ann Arbor, MI
 Oct-09, School on the Physical Implementation of Quantum Information, Montreal, Quebec
 Jun-08, Univ. Michigan Summer School on Quantum Physics, Ann Arbor, MI
 May-08, Les Houches International School of Physics, Les Houches, France
 Feb-06, 2nd Workshop on Trapped Ion Quantum Computing, Boulder, CO
 Jan-05, Ohio State University, Frontiers of Spectroscopy Lecture Series, Columbus, OH
 Aug-04, Neils Bohr Institute, Quantum Optics Summer School, Copenhagen, Denmark
 Jul-04, Perimeter Institute Summer School on Quantum Information, Waterloo, Ont, Canada
 May-02, APS Division of AMO Physics Annual Meeting Graduate Symposium, Williamsburg, VA
 May-02, Cross Border Workshop on Laser Science, Rochester, NY
 Jul-01, Enrico Fermi School of Physics, “Quantum Information,” Varenna, Italy
 Mar-01, Les Houches International School of Physics, Chamonix, France
 Nov-99, Sweden Autumn Physics School, Stockholm, Sweden
 Aug-99, Co-Director, Southwestern Quantum Inf. Network (SQUINT) Summer School, Santa Barbara, CA
 Mar-98, APS March Meeting Tutorial, Los Angeles, CA
 Jan-96, Jorge Andre Swieca Summer School for Quantum Optics, Rio de Janeiro, Brazil

Public Lectures

Nov-19, Anson L. Clark Memorial Lecture, “Quantum Computing,” University of Texas at Dallas
 Oct-19, Peter Domachuk Memorial Lecture, “Quantum Computing,” University of Sydney, Australia
 May-19, CLEO Plenary Lecture, “Quantum Computing with Atoms and Optics,” San Jose, CA
 Oct-18, Public Lecture, “Quantum Computing,” Santa Fe Institute, Santa Fe, NM
 Jul-18, Univ. Maryland “Science on Tap,” Milk Boy bar, College Park, MD
 Apr 18, APS April Meeting, Plenary Speaker, “Richard Feynman and Quantum Simulation”
 Jun-17: APS DAMOP Meeting, Public Lecture: “The Quantum Engineering Conundrum”
 Apr-17, Univ. Pittsburgh Quantum Institute Annual Symposium, Pittsburgh, PA
 Mar-17, Penn State Univ. Marker Lecture, State College, PA
 Jan-17, UC-Berkeley CQCS Inaugural Symposium, Berkeley, CA
 Nov-16: University of Maryland Saturday Morning Physics, “The Physics of Music”
 Oct-16, Univ. Stuttgart Inaugural Symposium for the Stuttgart IQST Institute
 Feb-16, Gunnar Källén Lecture, University of Lund, Lund, Sweden
 Oct-15, Plenary Speaker, Optical Society of America Annual Meeting, “Quantum Computing with Light,” San Jose, CA
 Sept-14, MIT Alumni Club of Washington DC, “Quantum Computers,” Washington, DC
 Jan-14, Washington Area CTO roundtable, “Quantum Information Science,” Crystal City, VA
 Oct-13, Plenary Speaker, Optical Society of America Annual Meeting, “Quantum Computing,” Orlando, FL
 July-12, University of Maryland Kapell Piano Competition, “The Physics of the Piano”, College Park, MD
 Dec-10, Public Lecture, “Art and Quantum Physics,” Inauguration of the Vienna Quantum Center (Vienna, Austria)
 Sept-08, NIST Public Colloquium, “The Physics of Music” (Gaithersburg, MD)
 Mar-07, Saturday Morning Physics Public Lecture, “The Music of Quantum Physics,” University of Michigan
 Mar-07, Saturday Morning Physics Public Lecture, “The Physics of Music,” University of Michigan

Student and Postdoctoral Advisees

Research Scientists

6. Guido Pagano, Univ. Maryland (2018-2019) – Rice University
5. Norbert Linke, Univ. Maryland (2017-2019) – University of Maryland
4. Jason Amini, Univ. Maryland (2016-2017) – IonQ, Inc.
3. Marko Cetina, Univ. Maryland (2015—)
2. Kai Hudek, Univ. Maryland (2015-2017) – IonQ, Inc.
1. Jonathan Mizrahi, Univ. Maryland (2015-2016) – IonQ, Inc.

Postdoctoral Researchers

39. Mikhail Shalaev, Duke Univ. (2021—)
38. Or Katz, Duke Univ. (2021—)

37. Han Bao, Duke Univ. (2021—)
36. George Toh, JQI and Univ. Maryland (2019—)
35. Will Morong, JQI and Univ. Maryland (2019—)
34. Crystal Noel, JQI and Univ. Maryland (2019—)
33. Lei Feng, JQI and Univ. Maryland (2019—)
32. Michael Goldman, JQI and Univ. Maryland (2017—)
31. Kristin Beck, JQI and Univ. Maryland (2016—)
30. Steven Moses, JQI and Univ. Maryland (2016-2018) – Honeywell, Inc.
29. Guido Pagano, JQI and Univ. Maryland (2015—)
28. Martin Lichtman, JQI and Univ. Maryland (2015—)
27. Jiehang Zhang, JQI and Univ. Maryland (2015—)
26. Norbert Linke, JQI and Univ. Maryland (2015-2017)
25. Paul Hess, JQI and Univ. Maryland (2014-2017) – Asst. Prof., Middlebury College
24. Grahame Vittorini, JQI and Univ. Maryland (2013—) –Honeywell, Inc.
23. Brian Neyenhuis, JQI and Univ. Maryland (2012—) – Honeywell, Inc.
22. Phil Richerme, JQI and Univ. Maryland (2012—) – Asst. Prof., Indiana University
21. Chenglin Cao, JQI and Univ. Maryland (2012-2013) – postdoc, Penn State University
20. Taeyoung Choi, JQI and Univ. Maryland (2011-2014) – physicist, IBM-Almaden
19. Susan Clark, JQI and Univ. Maryland (2010-2013) – Staff scientist, Sandia National Laboratories
18. Emily Edwards, JQI and Univ. Maryland (2009-2011) – Director of Scientific outreach, JQI
17. Qudsia Quraishi, JQI and Univ. Maryland (2008-2010) – Staff Scientist, Army Res. Laboratory, Adelphi, MD
16. Le Luo, JQI and Univ. Maryland (2008-2011) – Asst. Prof., Indiana Univ. Purdue Univ. Indianapolis, IN
15. Wesley Campbell, JQI and Univ. Maryland (2008-2012) – Asst. Prof, UCLA
14. Kihwan Kim, JQI and Univ. Maryland (2008-2011) – Asst. Prof., Tsinghua Univ, Beijing, China
13. Dzmityr Matuskevich, Univ. Michigan/Maryland (2006—) – Asst. Prof., National Univ. Singapore
12. Ming-Shien Chang, Univ. Michigan/Maryland (2006-2009) – Asst. Prof., Academia Sinica, Taipei, Taiwan
11. Peter Maunz, Univ. Michigan/Maryland (Postdoc: 2005-2008; Research Scientist: 2009)
10. Paul Haljan, Univ. Michigan (2003-2005) – Asst. Prof., Simon Fraser Univ. (Canada)
9. Winfried Hensinger, Univ. Michigan (2003-2005) – Asst. Prof., Univ. Sussex (U.K.)
8. Boris Blinov, Univ. Michigan (2001-2005) – Asst. Prof., Univ. Washington
7. Mary Rowe, NIST (1999-2000) – Staff physicist, NIST
6. Quentin Turchette, NIST (1997-2000) – Physicist, Research Electrooptics (Boulder, CO)
5. Cass Sackett, NIST (1997-2000) – Assoc. Prof, Univ. Virginia
4. Christopher Wood, NIST (1996-1998) – Optical Physicist, Network Photonics (Boulder, CO)
3. Christopher Myatt, NIST (1996-1998) – CEO and Founder, MBio Diagnostics (Boulder, CO)
2. Dietrich Leibfried, NIST (1995-1997) – Staff physicist, NIST (Boulder, CO)
1. Dawn Meekhof, NIST (1994-1997) – Physicist (Seattle, WA)

Graduate Students (Physics, Chemistry, Computer Science, and Engineering)

48. Mingyu Kang, Duke Univ. (2020–)
47. Isabella Goetting, Duke Univ. (2020–)
46. Debopriyo Biswas, Univ. Maryland (2019–)
45. Jameson O'Reilly, Univ. Maryland (2019–)
44. Arinjoy De, Univ. Maryland (2019–)
43. Kee Wang, Univ. Maryland (2018–)
42. Andrew Risinger, Univ. Maryland (2018–)
41. Katherine Collins, Univ. Maryland (2017–)
40. Laird Egan, Univ. Maryland (2017–)
39. Wen-Lin Tan, Univ. Maryland (2016–)
38. Allison Carter, Univ. Maryland (2016–)
37. Patrick Becker, Univ. Maryland (2016–)
36. Daiwei Zhu, Univ. Maryland (2016–)
35. Antonis Kyprianidis, Univ. Maryland (2015–)
34. Ksenia Sosnova, Univ. Maryland (2015–2020) – IonQ, Inc
33. Kevin Landsman, Univ. Maryland (2015–2019) – IonQ, Inc
32. Chris Rickerd, Univ. Maryland (2014-2016)
31. Alexis Parsagian, Univ. Maryland (2014-2016)

30. Harvey Kaplan, Univ. Maryland (2014–2019) – Air Force Research Laboratory, Rome NY
29. Clayton Crocker, Univ. Maryland (2013–) – Keysight, Inc.
28. David Campos, Univ. Maryland (2013–2017) – IonQ, Inc.
27. Caroline Figgatt, Univ. Maryland (2012–2018) – Honeywell, Inc.
26. Ken Wright, Univ. Maryland (2012–2017) – IonQ, Inc.
25. Aaron Lee, Univ. Maryland (2012–2016) – Northrup Grumman, Inc.
24. Ismail Inlek, Univ. Maryland (2011–2016) – IonQ, Inc.
23. Kale Johnson, Univ. Maryland (2011–2016) – IT Startup Founder
22. Jake Smith, Univ. Maryland (2011–2016) – Northrup Grumman, Inc.
21. Shantanu Debnath, Univ. Maryland (2010–2016) – IonQ, Inc.
20. David Hucul, Univ. Maryland (2009–2015) – Air Force Research Laboratory, Rome NY
19. Crystal Senko, Univ. Maryland (2009–2014) – Asst. Prof, University of Waterloo Dept of Physics
18. Jonathan Mizrahi, Univ. Maryland (2008–2014) – IonQ, Inc.
17. Andrew Manning, Univ. Maryland (2007– 2013) – Northrup Grumman, Inc.
16. Simcha Korenblit, Univ. Michigan/Maryland (2006–2013) – postdoc with N. Katz (Hebrew University, Israel)
15. Rajibul Islam, Univ. Maryland (2007–2012) – Asst. Prof, University of Waterloo Dept of Physics
14. David Hayes, Univ. Maryland (2007–2012) – Honeywell, Inc.
13. Yisa Rumala, Univ. Michigan (2006–2007)
12. Kelly Younge, Univ. Michigan (2005–2007)
11. Jon Sterk, Univ. Michigan/Maryland (2005–2010) – physicist at Sandia National Laboratory
10. Steven Olmschenk, Univ. Michigan/Maryland (2004–2009) – Prof., Denison University
9. Mark Acton, Univ. Michigan (2003–2007) – science teacher at Deerfield Academy, MA
8. Daniel Stick, Univ. Michigan (2002–2007) – physicist at Sandia National Laboratory
7. Kathy-Anne Brickman, Univ. Michigan (2002–2007) – Air Force Research Laboratory, Rome NY
6. David Moehring, Univ. Michigan (2002–2007) – Fund Manager, Cambium
5. Martin Madsen, Ph.D., Univ. Michigan (2002–2006) – Asst. Prof., Wabash College, IN
4. Louis Deslauriers, Ph.D., Univ. Michigan (2001–2005) – research scientist at Harvard University
3. Patricia Lee, Ph.D., Univ. Michigan (2000–2005) – Honeywell, Inc.
2. David Kielpinski, Ph.D., Univ. Colorado (1994–1999; with D. Wineland) – HP Laboratories, Palo Alto, CA
1. Brian King, Ph.D., Univ. Colorado (1994–1999; with D. Wineland) – StarFish Medical, Vancouver CA

Undergraduate Students

30 undergraduates and 4 high school students hosted in laboratory in past twenty years.