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Co-Director, Horace C. Hearne Institute for Theoretical Physics

Quantum Science and Technologies Group
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Service: I have served on numerous Department of Defense (DoD) review boards and organizational committees; in particular for the Army Research Office (ARO), the Defense Advanced Projects Research Agency (DARPA), the National Security Agency (NSA), and the Intelligence Advanced Research and Development Activity (ARDA). I organized the first international DoD workshops on photonic band-gap materials (1991), quantum cryptography and computing (1995), and the atom laser (1997). More recently I organized two workshops jointly sponsored by the DoD and NASA on quantum clock synchronization (2001) and quantum imaging and metrology (2003), as well as a DoD and Hearne Institute workshop on linear optical quantum information processing (2006), and a National Science Foundation (NSF) workshop on quantum materials and high-performance computing (2007). I have regularly served as technical advisor and reviewer for the National Academy of Sciences (NAS) and National Research Council (NRC), the DoD, the National Aeronautics and Space Administration (NASA), the National Science Foundation (NSF), and numerous international funding agencies, in the research areas of quantum computing and information processing; quantum optics; nanotechnology; quantum sensors; quantum imaging; coherent quantum electronics; photonic band-gap materials; atomic, molecular, and optical physics; and general relativity. I have also reviewed hundreds of research papers in these fields for professional journals, and I currently serve on the editorial board of the journals, Crystals, Quantum Technology, and Quantum Metrology and Measurement; and have served on the board of *Concepts of Physics,* the *Journal of Optics A* and *Physical Review A*. I was appointed Fellow of the Institute of Physics in 1998, of the Optical Society of America in 2005, the American Physical Society in 2008, and the American Association for the Advancement of Science in 2010. Since 2011 I have served as an Associate Member of the Beijing Computational Sciences Research Center (CSRC) and in 2012 I signed a memorandum of understanding between the LSU Hearne Institute for Theoretical Physics (HITP) and the CSRC on collaborations and student exchange in the area of quantum optics and quantum computing. In 2013, I participated as presenter and panelist at the Information & Communication Technologies and Counter-Terrorism Training session, held in New York City at the Counter-Terrorism Committee Executive Directorate of the United Nations, which reports directly to the UN Security Council. I also participated in a US Army Future Planning Meeting in 2013 where I served as an advisor to the Army Research Laboratory on the future of their quantum information program. In addition I visited the Japan National Institute of Communications Technologies (NICT) in November of 2013 and this visit resulted in a memorandum of understanding between NICT and the LSU Hearne Institute for Theoretical Physics for collaborations on quantum sensing and communications with exchange of visitors and students.

Funding: At the Army I regularly raised about $1M a year in in-house laboratory independent research program funds. While at JPL the budget for my Quantum Computing Technologies group averaged around $2.5M/Yr. I raised these funds from a variety of sources — primarily from the DoD, NASA, and the NSA and ARDA. Since coming to LSU I have been on three grants from the Army Research Office (ARO), the National Reconnaissance Office (NRO), and the Intelligence Advanced Research Projects Agency (IARPA), and Defense Advanced Research Projects Agency (DARPA), and numerous smaller grants, totaling nearly $12M as principal investigator (PI) or Co-PI, with about $3.0M of that coming to LSU.

Research Interests: My principal areas of research are in quantum science and technologies, particularly in quantum computing and quantum information technologies, quantum optics, foundations of quantum mechanics, and photonics. In particular, I am actively working in the areas of optical quantum computing and information processing, cavity quantum electrodynamics, photonic band-gap structures, quantum coherence, atom optics, quantum imaging, and quantum sensors. My recent topics of research are related to quantum technologies, including linear optical quantum information processing, quantum lithography and imaging, quantum gravity gradiometry, and quantum interferometry and metrology.

Research Plan: I will continue my work in theoretical studies of optical approaches to quantum information processing, including: linear optical quantum computing, quantum computing with Bose-Einstein condensates, cavity quantum electrodynamics, as well as theory of ion traps and other approaches to quantum optics related to electromagnetically induced transparency as well as superconducting qubits. I will also continue my research into the development of photonic band-gap materials for optical quantum information, such as for single photon sources and detectors, as well as for cavity QED approaches to interface solid-state and photonic qubits. I will continue my work on the general theory of entangled light and atoms in the context of quantum computation as well as quantum imaging and sensing systems. I will also pursue my work on using photonic band gap materials for spontaneous and thermal emission control.

Teaching Experience and Philosophy: As a graduate student at the University of Colorado, I was a teaching assistant in the mathematics department for two years. After receiving my MS in applied mathematics I was promoted to graduate instructor and for six years taught my own courses in college algebra, calculus I–III, linear algebra, differential equations, and introductory physics courses. I regularly won the annual university-wide graduate instructor teaching award. In 1988–89, I taught introductory physics at Metropolitan State University of Denver and the University of Colorado at Denver, also with very good student evaluations, and since coming to LSU I have taught graduate and undergraduate physics courses with outstanding reviews from the students and commendations from the dean and department chair. I believe in an exciting style of teaching with a good mix of lectures, collaborative student interactions, and demonstrations.

Formal Education:
BS with honors, Physics, University of Texas at Austin (1977).
MS Applied Mathematics, University of Colorado at Boulder (1981).
MS Physics, University of Colorado at Boulder (1984).
PhD Mathematical Physics, University of Colorado at Boulder (1988); Advisor, Asim O. Barut.
Educational Foundations, Policy, and Practice, University of Colorado at Boulder (1989–1990).
NASA Manager Training, Jet Propulsion Laboratory (2000).
NASA Leadership Training, Jet Propulsion Laboratory (2002).

Professional Experience

01/11–Present: Associate Member of the Beijing Computational Science Research Center (CSRC), Beijing China. This is a joint gratis appointment with the Joint Institute of Measurement Science, Tsinghua University and the National Institute of Metrology of China.

8/04–Present: Horace C. Hearne Jr. Professor of Theoretical Physics & Co-Director of the Hearne Institute of Theoretical Physics, Department of Physics and Astronomy, Louisiana State University (LSU). Along with Jorge Pullin, I am one of the two founding directors of the Hearne Institute for Theoretical Physics at LSU. The Institute carries out research on quantization of gravity, quantum optics effects in gravitational wave interferometers, decoherence due to quantum gravity, non-standard optics due to quantum gravity, quantum computing, quantum imaging, and quantum sensing. Along with Pullin, I supervise the operation of the Institute, which has more than ten associate faculty in the departments of Physics and Astronomy, Math, Electrical Engineering and Computer science, and is supported by the original Hearne endowment, as well as large grants from the National Science Foundation and the Department of Defense. The operating budget of the Institute is about $1M per annum. As supervisor of the Quantum Science and Technologies Group, which reports to the Institute, I am a principal investigator (PI) on a number of DoD and NSF grants. I currently mentor two associate professors (Drs. Hwang Lee and Georgios Veronis), and one assistant professor (Mark Wilde) and I have been research advisor for ten postdocs, ten graduate students, and numerous undergraduate students since 2004. In 2008 I was elected Fellow of the American Physical Society, and in 2004 Fellow of the Optical Society of America. Editorial Boards of *Crystals*, *Quantum Metrology* and, Quantum Technology, and *Crystals*.

01/05–12/08: Texas Experimental Engineering Station, Texas A&M University, College Station, TX.

01/05–09/08: Visiting Scientist, NASA JPL, Pasadena, CA.

10/00–8/04: Principal Scientist and Group Supervisor, Quantum Computing Technologies Group, NASA Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California. Procured over $2M in DoD

and NASA funding for JPL in FY02 for quantum technologies. Managed two large DoD grants for quantum technology research in gravity gradiometry and quantum clock synchronization. Organizer of NASA-DoD Workshop on Quantum Dots for Quantum Computing, Japan, 2002; Organizer of NASA-DoD workshop on Quantum Imaging and Metrology, Pasadena, 2002; Co-Organizer of Workshop on Photonic Crystals, Laguna Beach in 2002. Winner of 2002 Lamb Medal for Quantum Optics and Laser Sciences. Semi-Finalist for Discovery Magazine Technology of the Year Award for work in quantum lithography in 2000. Initiator of international collaborative effort between the JPL Quantum Computing Technologies activity and the Australian Center for Quantum Computing Technologies. The NSA funded this collaboration at $1.1M, (FY01–05). Leveraged a total of $3M in NSA funding for four different quantum-computing activities at JPL. I was PI on an Office of Naval Research (ONR) grant for quantum optics for $800K for (FY00–05). I was Co-I on multiple grants in quantum technologies in the JPL group. I served on the editorial board of *Physical Review A* and *Journal of Optics B*. My work focused on linear optical approaches to quantum information processing, superconducting quantum computing, and photonic crystal design for thermal emissivity and high-power laser applications. In 2000 I built up and supervised a world-class quantum optics laboratory in my group at JPL. In 2002 I was awarded the Willis E. Lamb Medal for Quantum Optics and Quantum Electronics and the NASA Space Act Award for the development of quantum lithography.

10/99–9/00: Principal Research Scientist, Quantum Computing Technologies Group, NASA Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California. During this period I initiated several new research programs, including the quantum optical gyro, quantum interferometric lithography, and an experimental program of atom interferometry for gravity gradiometry from space. I organized a new JPL quantum technologies thrust area, and served on a NASA panel for nanotechnologies. I was promoted to principal scientist in 1999. I developed two new key quantum technologies: quantum lithography and quantum atomic clock synchronization.

10/98–9/99: Research Scientist at the Senior Level, Ultra-Computing and Quantum Computing & Technologies Groups, NASA Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California. During this time I carried out research in quantum interferometry, quantum gravity gradiometry, and quantum information theory. In addition, I developed an entirely new research thrust area at JPL, called quantum technologies.

12/95–9/98: Research Physicist GS-12 & GS-13, Weapons Sciences Directorate, U. S. Army Aviation & Missile Command (AMCOM), Redstone Arsenal, Alabama. I was promoted to a GS-13 in the summer of 1996. During this period, I continued my work on photonic band gap materials and developed a novel matrix transfer method for understanding radiation rates from one-dimensional periodic structures. I also became involved in work on quantum computing and atom lasers, both topics of interest to the DoD. I produced an important paper on the quantum noise limits to the atom laser gyro. I organized an Army-sponsored meeting on atom lasers in Tucson in the spring of 1996. I was also one a member of the DoD Technical Advisory Committee for the multi-million dollar, Multidisciplinary University Research Initiative (MURI) that was awarded by ARO/DARPA in the spring of 1996 to UCLA in photonic crystals. In addition, I was also on the ARO/DARPA Technical Advisory Committee for the broad agency announcement for a MURI in quantum computing. This multi-million dollar MURI was eventually awarded in the summer of 1996 to Caltech. I continued to be a member on the DoD Technical Advisory Committee for these MURI programs. In the spring of 1997, I was on the ARO/DARPA review panel for proposals for the high infrared directional emissivity program, solicited under a DARPA broad agency announcement. In 1997 I received a grant from the ONR for my work on quantum gyroscopes. In 1996 I was awarded the Army Research and Development Achievement Award for Technical Achievement for my work in the area of photonic band-gap research. During this period, my patent on the optical diode was granted, and a new patent for a photonic band gap delay line was filed. I co-authored a review article on atom optics for a book chapter in Advances in Atomic, Molecular, and Optical Physics in 1997. I was also sole editor of the book: Electron Theory and Quantum Electrodynamics — 100 Years Later, Proceedings of NATO Advanced Study Institute held in Edirne, Turkey (Plenum, New York, 1997). I began a research program on using quantum optics and quantum computing techniques to improve interferometry and gyroscopy for an orders of magnitude improvement in laser gyro navigation. In 1996 I was awarded the Army Research, Development, and Engineering Award for my work on the theory of spontaneous emission in photonic crystals.

7/94–12/95, Research Physicist GS-11 & GS-12, Weapons Sciences Directorate, U. S. Army Aviation & Missile Command (AMCOM), Redstone Arsenal, Alabama. I worked in the quantum optics group with Dr. Charles Bowden. My work was a continuation of my research carried out there as a National Research Council (NRC) postdoc and Battelle contractor. I was AMCOM's chief investigator into the area of photonic band-gap materials, and I

continued to collaborate with Dr. Bloemer on several AMCOM research experiments in this field. I became an internationally recognized expert on cavity quantum electrodynamics (QED) and photonic band-gap structures, and I regularly advised the ARO in these areas. In addition, I was closely involved with the quantum optics research thrusts of: regular and cavity quantum electrodynamics, near dipole-dipole effects, lasing without inversion, foundations of quantum mechanics, atom optics, atom laser, quantum cryptography, and quantum computing. In July of 1994 I was the first Army researcher to report to the ARO on the recent developments in quantum computing and cryptography, which the ARO then deemed critical emerging new technologies. I worked with the ARO to organize an the first DoD workshop on quantum cryptography and quantum computing in 1995, and I continued to on the DoD Technical Advisory Committee to the ARO, DARPA, and the NSA on funding of these fields; work that involved reviewing proposals and monitoring ARO contracts. I was promoted to a GS-12 in the summer of 1995. I also worked with the ARO to organize a workshop on Army applications for the global positioning system, with special emphasis on the role of Einstein's theory of relativity in limiting satellite-determined location accuracy.

4/94–7/94, Contractor, Battelle Corporation, Research Triangle, North Carolina. I worked for AMCOM as a contractor. Primary task was to model and derive analytical formulas to describe spontaneous emission rates in GaAs/GaAlAs, layered, semiconductor heterostructures. This was in support of the photonic band edge laser and optical diode research experiments. During this period I developed a new method for computing the density of states and atomic emission rates in an arbitrary, layered, dielectric structure. I also provided consulting service to Prof. Marlan O. Scully at Texas A&M University in the area of local field effects in coherent optical media.

10/90–4/94, Research Associate, National Research Council, Weapons Sciences Directorate, U. S. Army Aviation & Missile Command (AMCOM), Redstone Arsenal, Alabama. I was working as a research associate for the National Research Council (NRC), National Academy of Sciences (NAS), under the advisorship of Dr. Charles Bowden at AMCOM. My research project consisted of an in-depth investigation into the properties of photon states of minimum phase uncertainty-states that would be useful in telecommunications and the making of sensitive laser gyroscopes. I also worked on cavity QED, nonlinear optics, a general theory of atomic emission rates in photonic band structures, neutron spin polarizers, and quantum limits to phase sensitivity in atom interferometers. In May of 1991 I gave an introductory lecture on photonic band gaps and photon localization before the Army Research Office (ARO), and based in part on this lecture, the Army labeled this area of quantum optics a critical emerging new technology. I organized a seminal workshop on this subject-held in January of 1992. In addition, I was an editor on a special issue of the Journal of the Optical Society of America on photonic band structures that appeared in February 1993. In 1993 and 1994 my study of photonic band edge effects led to several new opto-electronic device applications. In particular, I was co-inventor of the band edge laser, the nonlinear band edge optical limiter, and the optical diode. I collaborated on two experimental research projects: the band-edge laser and diode that resulted directly from my theoretical work.

6/89–9/90, Postdoctoral Researcher, Max Planck Institute for Quantum Optics (MPQ), Garching, Germany. Beginning in June of 1989, I began tenure at a 15-month postdoctoral position at the MPQ in Garching, under Prof. Herbert Walther, Director. My immediate research collaborator was Prof. Wolfgang P. Schleich, whom I worked with on the theory of nonclassical states of light, among other projects. I also did collaborative work with Professors G. S. Agarwal, A. O. Barut, M. O. Scully, and J. A. Wheeler while there. Projects that I worked on included: self-field QED, photon states of minimum phase uncertainty, atomic radiation in optical cavities, interference in phase space, and various other topics in quantum optics. This opportunity gave me the possibility to interact with a wide range of other physicists in the international quantum optics community.

1/89–5/89, Assistant Professor, Metropolitan State University of Denver (MSU), Denver, Colorado. Based on my stellar teaching ratings from the previous semester, I was promoted for the spring semester of 1989 to a full-time, temporary position as assistant professor at MSC. Duties included teaching undergraduate courses in physics and undergraduate physics laboratories. I also continued my theoretical research into the self-field approach to QED by developing an account of the Unruh effect of an accelerating detector and the related Hawking radiation from a black hole.

6/88–12/88, Part–time Instructor, Metropolitan State College (MSC), Denver, Colorado, and University of Colorado at Boulder. After completion of my PhD in May of l988, I was working part–time as an instructor at the two above-mentioned institutions. During the summer of l988, I was a recitation instructor for a second-semester, calculus-based physics course at CU Boulder. That fall term I was co-teaching and developing an experimental course in quantitative reasoning and math skills at CU Boulder that was eventually adopted into the required under-

graduate curriculum. For this course I was awarded a certificate of teaching excellence. During this time, I was also in charge of several laboratory and self-paced sections of physics and astronomy at MSC. During this period, I was also collaborating with Prof. Barut at CU on publications related to my PhD research.

Memberships in Professional and Honorary Societies

1. American Association for the Advancement of Science, Fellow
2. American Physical Society, Fellow
3. Institute of Physics, Fellow
4. Optical Society of America, Fellow

Awards

1. US Army Defense Intelligence "Mad Scientist" Certification (2017)
2. Department of Physics and Astronomy Outstanding Graduate Faculty Teaching Award (2017)
3. Louisiana State University Undergraduate Physics & Astronomy Majors Teaching Award (2013)
4. Louisiana State University Foundation Distinguished Faculty Teaching Award (2012)
5. Rainmaker, Louisiana State University, 2009.
6. Fellow, American Association for the Advancement of Science, 2009.
7. Fellow, American Physical Society, 2008.
8. Fellow, Optical Society of America, 2005.
9. NASA Space Act Award, "Quantum Interferometric Lithography," 2002.
10. Willis E. Lamb Medal for Laser Science and Quantum Optics, "For pioneering contributions to quantum electronics and especially the study of spatial coherence effects of multiphoton entangled states (quantum lithography)," 2002.
11. Discover Magazine Technology of the Year Award (semi-finalist), 2000.
12. US Army Research, Development, & Engineering Achievement Award for "Development of mathematical models of electromagnetic wave emission and propagation in photonic band-gap materials," 1996.
13. US Army Award for "Assessment of the relativity community for application of Einstein's General Theory of Relativity for improvement of accuracy in the Global Positioning System," 1995.
14. National Research Council Associateship Awards: 1990–1994.
15. Fulbright Travel Grant Award, 1989.
16. Fellowship Award from the Italian Ministry of Foreign Affairs, 1986.
17. Graduate Instructor Awards for Teaching Excellence, l983 and 1988.
18. Marquis Who's Who in the South and Southwest
19. Marquis Who's Who in Science and Engineering
20. Men of Achievement.
21. International Who's Who.
22. Dictionary of International Biography.
23. Strathmore's Who's Who.

Summary of Significant Achievements

1. Developed computational theory and modeling and design framework for the optimization of quantum sensors. Developed concept for broadband optical delay device based on electromagnetically induced transparency. Developed design for Heisenberg limited charge and magnetic flux sensor based on superconducting elements and cavity quantum electrodynamics. Developed scheme for simulating the expansion of the universe in optical ion traps. Wrote significant review article on the field of linear optical quantum computing. Developed new scheme for quantum computation exploiting vortex states in Bose-Einstein condensates. Invented scheme to exploit the quantum Zeno effect to mitigate photon loss in quantum optical information processors. Developed polarization encoding scheme for fault-tolerant linear optical quantum computation. Designed a photonic crystal device for single photon sources for quantum optical communications.

2. Invented the fields of quantum interferometry, quantum gyroscopy, quantum clock synchronization and quantum lithography, while working in quantum computing technologies group at JPL. Instituted JPL

quantum technologies seminar series. Initiated JPL quantum atomic gravity gradiometer program. Developed JPL quantum Internet test-bed facility. Initiated new JPL superconducting quantum computer program. Initiated collaboration between JPL and Australian Center for Quantum Information. Organized NASA-DoD workshop on quantum clock synchronization for space applications (2000). Organized NASA-DoD workshop on quantum dots for quantum computing, Kochi, Japan, (2002). Organizing NASA-DoD workshop on quantum imaging and metrology, Pasadena, 2002.

3. Developed the application of Electron-Nuclear Double Resonance (ENDOR) techniques in quantum computing. Discussed ENDOR resolution as a possible limiting factor in NMR quantum computing techniques. Discovered hat ENDOR and double-ENDOR techniques have sufficient resolution for quantum computing applications.

4. I was an author of an invited review chapter, "Evanescent Light-Wave Atom Mirrors, Resonators, Waveguides, and Traps," in Advances in Atomic, Molecular, and Optical Physics. This work has become a standard reference guide in the field.

5. In the summer of 1995 I alerted the ARO to recent developments in quantum cryptography and quantum computing that could have an important impact on national security. In particular, quantum computers have been shown to be powerful tools for secret code decryption. I helped the ARO organize a workshop in conjunction with the NSA on the prospects for quantum computing and quantum cryptography (1995). From that meeting, several millions of dollars were allocated by the ARO and the NSA for academic research in quantum computing. I served on the ARO Technical Advisory Committee on quantum information processing from 1995 through 2005.

6. In 1995 I reviewed some recent developments concerning the incorporation of Einstein's theory of relativity in the global positioning system. I organized an Army-sponsored workshop on Army applications of the global positioning system that was held in North Carolina (1995). In particular, I helped advise on the technical content of the symposium, which discussed the relativity limited accuracy of the GPS for missile guidance.

7. Working with Dr. Bowden and Dr. M. O. Scully (Texas A&M), I was a principle investigator into the effects of near dipole-dipole (NDD) interactions in systems that exhibit lasing without inversion (LWI). I demonstrated the NDD-induced super-enhancement of inversionless gain and absorptionless index of refraction, as well as piezophotonic and magnetophotonic switching.

8. I developed a scheme for the utilization of PBG structures for use in a passive Identify Friend or Foe (IFF) device. I developed numerical simulations of the process.

9. I contributed to the theory and development of a photonic band edge optical limiter and optical diode. This work was published in the Journal of Applied Physics, my most cited paper, and a patent on the diode was awarded.

10. I organized an Army-sponsored workshop on the development and applications of photonic band-gap materials (1992), and was co-author on the proceedings. I was technical advisor to the Army in the area of photonic crystals.

11. I became an internationally recognized expert in the emerging new field of photonic band-gap (PBG) materials. I developed a complete analytical theory of atomic and antenna emission rates in PBG structures. I also studied the radiative properties of emitters near the band edge with application to optical computing and energy storage devices. I studied the anomalous index of refraction in these materials and have developed concepts for ultra-light, ultra-compact optical instruments and laser linear accelerator particle beam devices. I have studied the group velocity properties of photonic crystals and developed a true-time delay line. A patent was granted on this device. I developed a novel concept for a photonic band edge optical limiter.

12. I published a series of papers that account for cavity effects on atomic emission rates from a manifestly classical point of view, allowing particularly clear insight into the phenomenon. Applications to improved-gain, low-threshold micro laser operation were developed. I conducted an experiment with an instructor

and undergraduate students at the University of Alabama at Huntsville that proves the classical nature of apparatus-dependent atomic emission rates. I am considered an internationally recognized expert in the area of cavity quantum electrodynamics.

13. Co-developer with Professors W. P. Schleich and J. A. Wheeler of a powerful new mathematical method for treating problems in quantum optics. The method, known as interference in phase space, has already proved to be very useful for simplifying calculations in many areas of nonlinear optics. I applied the technique to the study of quantum states of minimal phase noise. Such states have tremendous implications for ultimate quantum limits to the sensitivity to laser gyroscopes.

14. Co-developer with A. O. Barut of a new self-field theory of quantum electrodynamics (QED). Obtained theoretical value for the electron's gyromagnetic ratio in a theory where the electromagnetic field is not second quantized. Applied theory to cavity corrections to atomic emission rates and level shifts. Calculated apparatus-dependent effects on electron gyromagnetic ratio and help to settle controversy of the origin of a systematic error in the ultrahigh precision Penning trap measurements of this ratio. Offered an alternative approach to understanding the Unruh effect and the related Hawking radiation from the self-field approach. Also developed a self-field, two-level atom, model that allows laser action and other nonlinear quantum optical effects to be understood from a self-field point of view.

Sabbatical: In 2011 I took my first sabbatical ever, fully funded by LSU for one half of the Academic Year in the spring. I split the time between the Beijing Computational Research Center and Texas A&M University (TAMU). The sabbatical resulted in a publication with collaborators from Beijing, "Quantum Information Teleportation without Entanglement: Non-Zero Quantum Discord Suffices," Lei Wang, Jie-Hui Huang, Jonathan P. Dowling, Shi-Yao Zhu, arXiv:1106.5097, as well as with collaborators from TAMU, Sete Eyob A.; Dorfman Konstantin E.; Dowling Jonathan P.; Phase-controlled entanglement in a quantum-beat laser: application to quantum lithography; JOURNAL OF PHYSICS B-ATOMIC MOLECULAR AND OPTICAL PHYSICS; Volume: 44; Article Number: 225504; NOV 28 2011. In addition I submitted a successful book proposal to Taylor and Francis press for a popular science book, *Schrödinger's Killer App: Race to Build the World's Quantum Computer*. This book was published 15 May 2013 and has sold a thousand copies to date. I have been approved for a second sabbatical in Spring of 2018, where I will be at the University of Texas working on my new book, *Schrödinger's Rainbow — The Race to Build the Quantum Internet.* I currently have offers from Taylor and Francis as well as Springer to publish it.

Consulting and Committee Membership and Outreach
Regular reviewer of manuscripts for the journals: *Physical Review, Optics Communications, Foundations of Physics, Journal of the Optical Society of America, Journal of the European Optical Society, Journal of Applied Physics, Applied Physics Letters, American Journal of Physics, Nature,* and *Science.* In addition I have been a special issue editor for the *Journal of the Optical Society of America, Foundations of Physics, the Journal of Modern Optics,* and *Superlattice Microstructures*.

- Presenter & panelist at US Army Futures Meeting, Washington, DC (2013).
- Presenter & panelist at Information & Communication Technologies and Counter-Terrorism Training session, Counter-Terrorism Committee Executive Directorate, United Nations, NY (2013).
- Editorial Board of *European Journal of Physics: Quantum Technology* (2012–Present).
- Editorial Board of *Quantum Measurement & Metrology* (2012–Present).
- Speaker, Louisiana Junior Science & Humanities Symposium (2011).
- Expert Panelist, Canadian Foundation for Innovation, Quantum Computing and Nanosystems (2010).
- Editorial Board of *Crystals* (2010–Present).
- National Academy of Sciences Review Board of the National Institute of Standards and Technology (2008-2009).
- Adviser, US Army War Games, Emerging Technologies (2008–2009).
- Department Steering Committee (2007–Present).
- Department Awards Committee (2007–Present).
- University Faculty Search Committees (2004–2007).
- Panel Member, LSU School of Art Gallery, "Modern Physics and the Mystery of Reality" (2007).
- Department Business Operations Committee (2007).

- Dean's PhD Representative (2007&2008).
- NSF Panel Reviewer on Quantum Materials and High-Performance Computing (2006–2007).
- Editorial Board, *Concepts of Physics* (2005–Present).
- Visiting Scientist, NASA Jet Propulsion Laboratory (2004–2008).
- Research Advisor, Texas Engineering Experimental Research Station, Texas A&M University (2004–Present).
- Panel on Digitization and Communications Science of the Army Research Laboratory Technical Assessment Board (2004–Present).
- Editorial Board, *Physical Review A* (2000–2004).
- Editorial Board, *The Journal of Optics A* (1998–2004).
- Technical Advisory Committee, DARPA-ARO, MIT MURI Center for Quantum Memory (2000–2005).
- Technical Advisory Committee, DARPA-ARO, Caltech MURI Center for Quantum Networks (2000-2005).
- NSF Panel Review on Quantum Computing and Information (2003–2004).
- Consultant to Sony Pictures on motion picture, *Frozen* (2001).
- Consultant to Steven Spielberg, Dreamworks Studios, on motion picture, *The Time Machine* (2001).
- Technical Advisory Committee, DARPA-ARO, University of Rochester MURI for Center for Quantum Networks (2000–2005).
- Consultant to JPL, on NASA Nanotechnology Initiative (2000).
- Consultant to JPL on NASA Quantum Technology Initiative (2000).
- Consultant to the NRO and ARDA on quantum technology development (1994-2000).
- Technical Advisory Committee, ARO and NSA, for quantum computing & quantum information (1998).
- Consultant to Air Force on proposals and scientific matters related to the field of quantum computing (1998–Present).
- Technical Advisory Committee, DARPA and ARO program on highly controlled infrared directional emissivity (1995).
- Technical Advisory Committee, DARPA and ARO program on photonic band gap MURI (1995).
- Technical Advisory Committee, DARPA and ARO program on quantum computing MURI (1995).
- Consultant to Army on applications of photonic band gap materials to improvement of phase array radar systems (1994).
- Consultant to Army on utilizing photonic band gap material to enhance power output of microwave resonators (1994).
- Consultant to Quantum Visions Corporation, on utilizing microcavity quantum electrodynamic effects to improve flat-screen display technology (1994).
- Consultant to Army on optical methods for measuring tension in wound fiber bobbins used in the fiber optics guided missiles (1994).
- Consultant to Army on an experimental proposal to improve the accuracy of the global positioning system by including special and general relativistic effects (1994).
- Consultant to Physics Department, University of Alabama at Huntsville on experimental cavity QED, photonic band-gap materials, and sonoluminescence (1993).

Grant Awards and Contract Monitoring and Managing

1. DARPA, "Theory of Fundamental Limits to Photon Detection and Design of Novel Detectors," FY17–18, $300K, PI (awarded).
2. NIH, "Topological and Green function approach to detecting brain tumors from diffusion tensor MRI," FY17–18, 140K, Co-PI (pending).
3. LSU BOR LINK, "Quantum Technologies for Space Applications, FY17, $6K, PI (awarded).
4. NIST, "NIST Summer Undergraduate Research Fellowship," FY17, $9.5K, PI (awarded).
5. ARO, "Quantum Computation to Quantum Sensing, Imaging, and Metrology," FY17–20, $355K, PI (pending).
6. University of California, San Diego / NSF-AQUIRE, "Quantum Communication Circuits on a CMOS Chip (QC4)", FY17–21, $390K, Co-PI (pending).
7. LSU EDA, "Quantum Radar — Remote Sensing at the Ultimate Limits," FY16–20, $100K, PI.

8. LSU EDA, "Study plan for High-Efficiency and Low-Cost Lighting Using Photonic Crystals," FY15–19, $100K, PI.
9. NSF TAMOP, "The Rise of the Boson-Sampling Quantum Computer," FY15–18, $210K, PI.
10. NSF & LSU BOR EPSCOR PFund, "The Rise of the Boson-Sampling Quantum Computer and The Renaissance of the Linear Optical Quantum Interferometer, FY14-15, $10K, PI.
11. Boeing / DARPA, "Low Variance Measurements of Photon Number and Phase for Thermal Beams in the Quantum Regime," FY14–FY15, $180K, Co-I.
12. ARO, "From Quantum Computing to Quantum Sensing," FY13–FY16, $326K, PI.
13. William & Mary College / AFOSR, "Investigations Of Long-Lived Spin Coherence In Atomic Ensembles At High Optical Depth," FY13–FY17, $250K, Co-PI.
14. "Telcordia / IARPA, "Protocols, Languages and Tools for Resource-Efficient Quantum Computation," FY11–14, $638,957, Co-PI. (Program was terminated in May 2013 due to sequestration.)
15. NSF, "Quantum Optical and Atomic Interferometry," FY10–FY13, $210K, PI.
16. LSU EDA, "Photonic Crystals for Improved Solar Cells," FY10–14, $100K, PI.
17. MathSense Analytics / AFOSR STTR, "Quantum Cryptography," FY10, $50K, Co-PI.
18. LSU BOR LINK, FY09, $6K.
19. Sandia Laboratories, Quantum Sensors, FY09, $70K, PI.
20. Northrop Grumman Space Technologies, Quantum Sensors, FY08–16, $300K, PI (Foundation).
21. The Boeing Company, Ghost Imaging, FY08–10, $75K, PI.
22. LSU BOR LINK, FY05–08, $12K.
23. DARPA Quantum Sensors Program, Quantum LIDAR, FY07–08, $750K, PI.
24. FQXI, Quantum Measurement in the Timeless Universe, FY08-10, $200K, PI.
25. NRO Directors Innovation Initiative, Photonic Crystals for Satellite Thermal Control, FY06, $400K, Co-I.
26. ARO-IARPA Quantum Computation Concept Maturation Program, Linear Optical Quantum Computing, FY05-09, $600K, Co-PI.
27. ARO Multi-Disciplinary University Research Initiative, Quantum Imaging, FY05-00, $500K, Co-PI.
28. NRO Directors Innovation Initiative, Improved Solar Cells Using Photonic Crystals, $350K, FY04, PI.
29. NRO Directors Innovation Initiative, Quantum Atomic Magnetometry, $350K, FY02, Co-I.
30. ONR Quantum Optics Program, Experimental Quantum Interferometry, $150K/Y, FY03-05, PI.
31. NSA-ARDA Quantum Computation Program, Theory and Modeling of Linear Optical Quantum Computers, $260K/Y, FY03-05, PI.
32. NASA Intelligent Systems, Quantum Clock Synchronization, $1M, FY01-03, Co-I.
33. DARPA Military Technology Office, Quantum Atomic Gravity Gradiometer, $300K, FY02, Co-I.
34. DARPA Advanced Technology Office, Quantum Clock Synchronization, $500K, FY01-03, Co-I.
35. NASA-JPL Director's Discretionary Funding, Quantum Optical Interferometry, $100K, PI.
36. National Security Agency, Radio-Frequency Single Electron Transistors and Open Mesoscopic Quantum Systems, $600K, FY01-FY03, PI.
37. NASA-JPL Director's Discretionary Funding, Quantum Lithography, $25K, FY01, PI.
38. NASA-JPL Director's Research and Development Fund, Quantum Clock Synchronization, $100K, FY02, PI.
39. NASA-JPL Director's Research and Development Fund, Artificial Life, $100K, FY02, PI.
40. NASA Advanced Concepts, Quantum Lithography, $25K, FY01, PI.
41. NASA Advanced Concepts, Entangled Photon Light Sails, $25K, FY01, PI.
42. NRO Advanced Science and Technology, Quantum Atomic Gravity Gradiometry, $1.1M, FY01, PI.
43. NASA Thinking Systems, Quantum Algorithms, $300K, FY00-02, PI.
44. NASA Revolutionary Computing Technologies and Intelligent Systems, Quantum Algorithms, $600K, FY99-01, PI.
45. NRO and ARDA, Quantum Clock Synchronization, $575K, FY00-01, PI.
46. NRO Director's Innovation Initiative, Coherent Quantum Atomic Gravity Gradiometry for Remote Sensing, $315K, FY00, PI.
47. ONR Quantum Optics Program, Quantum Optical Gyroscopy, $345K, FY99-02, PI.
48. NASA-JPL Director's Research and Development Fund, Quantum Accelerometry, $75K, FY02, PI.
49. NASA-JPL Director's Research and Development Fund, Quantum Interferometry, $75K, FY99, PI.
50. AMCOM In-house Laboratory Independent Research Program, Optically Generated Photonic Band Gap Materials, $100K, FY97, PI.

51. AMCOM In-house Laboratory Independent Research Program, Photonic Band Gap Material Microwave Antenna Noise Filter, $100K, FY96, PI.
52. AMCOM In-house Laboratory Independent Research Program, Photonic Band Edge Optical Diode, $100K, FY95, PI.
53. AMCOM In-house Laboratory Independent Research Program, Photonic Band Edge Laser, $100K, FY94, PI.

Teaching, Advising, Mentoring

Recent Courses Taught (Student Evaluation Score on "Overall Instructor Rating" as a Percentile)

PHYS7354, Atomic and Optical Physics II, Spring 2017.
PHYS7353, Atomic and Optical Physics I, Fall 2016 (95%)
PHYS7212, Advanced Mathematical Methods II, Spring 2016 (99.5%)
PHYS2113, Electricity and Magnetism and Gravity for Engineers, Fall 2015 (99.5%)
PHYS2113, Electricity and Magnetism and Gravity for Engineers, Fall 2014 (97%)
PHYS2113, Electricity and Magnetism and Gravity for Engineers, Spring 2015 (98%)
PHYS7212, Advanced Mathematical Methods II, Spring 2014 (98%)
PHYS4142, Introduction to Quantum Mechanics II, Fall 2013 (100%)
PHYS4141, Introduction to Quantum Mechanics I, Spring 2013 (95%)
PHYS4142, Introduction to Quantum Mechanics II, Fall 2012 (93%)
PHYS4141, Introduction to Quantum Mechanics I, Spring 2012 (99%)
PHYS7212, Advanced Mathematical Methods II, Fall 2011 (100%)
PHYS7211, Advanced Mathematical Methods I, Fall 2010 (90%)
PHYS2102, Electricity and Magnetism for Engineers, Spring 2010 (93%)
PHYS4112, Intermediate Mathematical Methods, Fall 2009 (100%)
PHYS2101, Electricity and Magnetism for Engineers, Spring 2009 (96%)
PHYS4112, Intermediate Mathematical Methods, Fall 2008 (100%)
PHYS7354, Atomic and Optical Physics II, Spring 2008 (100%)
PHYS7353, Atomic and Optical Physics I, Fall 2007 (100%)
PHYS2102, Electricity and Magnetism for Engineers, Spring 2007 (92%)
PHYS7241, Quantum Mechanics I, Fall 2006 (98%)
PHYS7242, Quantum Mechanics II, Spring 2006 (96%)
PHYS7241, Quantum Mechanics I, Fall 2005 (94%)
PHYS7242, Quantum Mechanics II, Spring 2005 (92%)

Postdocs Past and Present (Current Position)

2011–2013: Moochan "Barnabas" Kim (Researcher at Texas A&M)
2011–2013: Katherine Brown (Trainee Patent Attorney at Boult Wade Tennant, UK)
2008–2011: Petr Anisimov (Research Scientist, Los Alamos National Labs)
2008–2011: Chanjun Min (Associate Professor, Nankai University, Tianjin, PRC)
2006–2008: Dimtry Uskov (Associate Professor, Bresica University)
2005–2009: Sulakshana Thanvanthri (Assistant Professor, Eastern Connecticut State University)
2005–2009: Christoph Wildfeuer (Assistant Professor, University of Applied Sciences, Northwestern Switzerland)
2005–2008: Hugo Cable (Research Associate, University of Bristol.)
2005–2007: Pavel Lougovski (Research Scientist, Oak Ridge National Labs)
2005–2007: Gabriel Durkin (Research Scientist, NASA Ames Research Center)
2005–2006: Kurt Jacobs (Research Scientist, Army Research Laboratory)
2004–2007: Kishore Kapale (Associate Professor, Western Illinois University)
2004–2006: M. Ali Can (Professor, TUBİTAK University, Turkey.)
2003–2007: Marian Florescu (Professor, University of Surrey)
2003–2007: Lucia Florescu (Visiting Researcher, University of Surrey)
2001–2003: Robert Gingrich (Vice President, PIMCO)
2000–2002: Pieter Kok (Professor, University of Sheffield)
1999–2001: Hwang Lee (Associate Professor, LSU)

Graduate Students Past and Present (Degree and Graduation Date and Current Position)

2014–Present: Sushovit Adhikari
2014–Present: Nick Studer
2014–Present: Haoyu Qi
2013–Present: Robert Nick Lanning
2012–2016: Jonathan Olson (Postdoc, Harvard University)
2012–2016: Bryan Gard (Postdoc, Army Research Laboratory)
2011–Present: ZhiHao Xiao
2011–2016: Manesh Gupta (Postdoc, Harish-Chandra Research Institute, India)
2010–2015: Christopher Granier (Instructor, Denham Springs Christian Academy)
2010–2014: Kaushik Seshadreesan (Postdoc, Max Planck Institute for the Science of Light)
2010–2014: Bhaskar Roy Bardhan (Visiting Assistant Professor, State University of New York at Geneseo)
2009–2016: Robinjeet Singh (Postdoc, NIST Gaithersburg)
2008–2014: Kebei Jiang (Seismic Imager, CGG Corporation)
2008–2012: Christopher Richardson (Quantitative Analyst at Chatham Financial)
2006–2010: William Plick (Assistant Professor, University of Dayton), Distinguished Dissertation.
2006–2009: Sean Huver (Founder and CEO of Founder at Deep Science AI)
2006–2009: Ryan Glasser (Assistant Professor, Tulane University)
2005–2009: Argenis DaSilva (PhD 2009)
2005–2008: Stephan Olson (PhD 2008, Associate Professor, Boise State University)
2005–2007: Zhanghan Wu (MS 2007)
2005–2007: Muxin Han (MS 2007, Assistant Professor, Florida Atlantic University)
2005–2007: Ganesh Selvaraj (MS 2007)
2005–2006: Guohui Deng (MS 2007, Server Software Developer, Harris Corporation)

Visiting Graduate Students

2016–2017: Xiaoping Ma, East China Normal University (Funded by China Scholarship Council)
2014–2015: Dong Li, East China Normal University (Funded by China Scholarship Council)

Undergraduate Research Students (Funding Source, Last known post)

2014–Present: Margarite LaBorde (URAP, accepted to NIST SURF program summer 2017)
2016–Present: Osa Adun (URAP, African American)
2016–Present: Andrew Lawrence (URAP)
2014–2016: Emma Annelise Bergeron (Honors Student, PhD Program, University of Waterloo, Canada)
2016: Francesca White (URAP)
2016: Kenji Arai (REU)
2016: Jonathan Kunjummen (REU)
2014: Kyle Lance (NSF REU)
2014: Joshua Kamrass (NSF REU)
2014–2016: Darnelle Cuyler (URAP, PhD Program Florida State University, African American)
2014–2015: Jonathan Curole (URAP, PhD Program, Indiana University)
2013: Michelle Lollie (NSF REU, PhD Program, Indiana University, African American)
2013: Erik Navarro (NSF REU, PhD Program, Princeton, Hispanic)
2013–Present: Simón Lorenzo (CAF, Will attend PhD program at Stanford in Fall of 2017, Hispanic)
2013–2014: Andrew Galatas (CAF)
2012: Patrick Keiffer (NSF)
2012: Martial Morrison (NSF, PhD Program, LSU),
2012–2016: Todd Moulder (NSF, McNair, Junior Software Engineer at inXile Entertainment, Army Veteran)
2012–2013: Matthew Buras (HHMI)
2012–2013: Joshua Mendez (S-STEM, PhD Program Florida State University, Hispanic)
2012–2013: Hanna Broadus (SURE, NSF)
2012–2013: Cole Gulino (NSF)

2010–2012: Sumit Sarbadhicary (NSF, PhD Student in Physics at UPenn)
2010–2012: Robert Cross (LA-STEM, PhD Student at University of Rochester)
2010–2012: Keith Motes (NSF, PhD Student Macquarie University)
2010–2012: Chase Brignac (LA-STEM, Boeing Corporation)
2009: Austin Hartwell (CSA)
2009–2012: Carl Sabottke (CAF, Goldwater)
2009–2012: Bryan Gard (LA-STEM & HHMI, PhD Student in Physics at LSU)
2008–2009: Kyle Volkman (CFLR)
2007–2011: Daniel Lum (LA-STEM, PhD Student in Physics, University of Rochester)
2007–2010: Gretchen Raterman (NSF, MS Student, Duke University Medical Physics Program)
2007–2010: Christopher Granier (LA-STEM, PhD Student in Physics at LSU)
2005: Frank Henchy (CAF)
2005–2008: Nicholas VanMeter (CAF, PhD Student in Physics at Harvard)
2003: Attila Bergou (Postdoc, Brown University School of Engineering)
2001–2002: Matt Stowe (PhD student at University of Colorado with Jun Ye)
2001–2002: Lin Song
2001–2002: Andrew Stimpson (PhD Student in Physics at Stony Brook, NY)
1999: Agedi Boto (Graduate Student, The Johns Hopkins University School of Medicine)
1998: Christopher Cornelius
1997: Rachel Flynn
1996: Jon Bendickson (Senior Engineer, Dynetics, Inc., Huntsville, Alabama)

High School Students

2016–Present: Mary Catherine Lorio, St. Joseph's Academy (HSAP, Science Fair Project Placed First in JSHS symposium, $2000 Scholarship, Will compete in National and International Science Fairs in May, 2017).
2013: Lena Le, St. Joseph's Academy (Science Project Placed first in Computer Science category. Received the Naval Science Award and Intel's Computer Science Award)

Technical Conferences and Workshops Organized

1. Quantum Noise and Model Reduction Workshop, 26–27 January 2015, Laurel, MD.
2. Quantum Information and Measurement Conference, 17–19 June 2013, Rochester, NY.
3. Session on Quantum Sensors, Physics of Quantum Electronics, Snowbird, UT (03–07 January 2011).
4. The Third International Workshop on Theoretical and Computational Nano-Photonics," Bad Honnef, Germany, 3–5 March 2010.
5. The Second International Workshop on Theoretical and Computational Nano-Photonics," Bad Honnef, Germany, 28–30 October 2009.
6. The First International Workshop on Theoretical and Computational Nano-Photonics," Bad Honnef, Germany, 3–5 December 2008.
7. Symposium on the Computational and Experimental Aspects of Electromagnetic Metamaterials, International Conference on the Computational and Experimental Engineering and Sciences, Honolulu, Hawaii, 17–22 March 2008.
8. Session on Quantum Sensors, Physics of Quantum Electronics, Snowbird, Utah, 6–11 January 2008.
9. LSU-NSF Workshop on Quantum Materials and High-Performance Computing (QMHP), Arlington, Virginia, 16–17 April 2007.
10. International Focus Workshop on Linear Optical Quantum Information Processing (LOQuIP), Baton Rouge, Louisiana, 9–12 April 2006.
11. Focus Sessions, Topical Group on Quantum Information, 2006 American Physical Society March Meeting, March 13–17, 2006; Baltimore, MD.
12. Special Session on Optical Approaches to Quantum Information Processing, Optical Society of America Annual Meeting, Tucson, Arizona, 9 October 2003.
13. International Workshop on Quantum Dots for Quantum Computing, University of Notre Dame, Indiana, 6–9 August 2003.
14. NASA-DoD Workshop on Quantum Imaging and Metrology, Pasadena, California, 13-15 November 2002.
15. International Workshop on Photonic and Electromagnetic Crystal Structures, University of California, Los Angeles, 28–31 October 2002.

16. Progress in Electromagnetics Research Symposium, Boston, Massachusetts, 24–28 June 2002.
17. Workshop on Quantum Information Processing at the Winter International Symposium on Information and Communications Technologies, Cancun, Mexico, 5–9 January, 2004,
18. Southwest Quantum Information and Technology Network Fourth Annual Meeting, Boulder, Colorado, 8–10 March 2002.
19. International Workshop on Quantum Dots for Quantum Computing, Kochi, Japan, 26–28 January 2002.
20. 7th International Conference on Squeezed States and Uncertainty Relations, Boston, Massachusetts, 4–8 June 2001.
21. Southwest Quantum Information and Technology Network Annual Meeting, Pasadena, California, 2–4 March 2001.
22. NASA-DoD Workshop on Quantum Information and Synchronization For Space Applications (QuICSSA), Glendale, California, 25-26 September 2000.
23. Session on Quantum Computing, Winter Workshop on Quantum Electronics, Snowbird, Utah, 8–12 January 2001.
24. Session on Photonic Crystals, Progress in Electromagnetics Research Symposium, Boston, Massachusetts, 7–14 July 2000.
25. Session on Quantum Gyroscopes, Winter Workshop on Quantum Electronics, Snowbird, Utah, 10-14 January 2000.
26. Workshop on Electromagnetic Crystal Structures, Design, Synthesis, and Applications, Laguna Beach, California, 6–8 January 1999.
27. Army Research Office Workshop on Atom Lasers, Tucson, Arizona, 23–24 January 1997.
28. Army Research Office Workshop on Quantum Computing and Cryptography, Tucson, Arizona, 15–16 February 1995.
29. NATO Advance Study Institute on Electron Theory and Quantum Electrodynamics — 100 Years Later, Edirne, Turkey, 5–16 September 1994.
30. ARO Workshop on the Development and Applications of Photonic Band Structures, Park City, Utah, 28–30 January 1992.

Publications: Over 150 publications in quantum optics, quantum computing and information, quantum science and technologies, laser physics, and mathematical physics. These publications have been cited over 7,000 times, with an average over 50 citations per paper, and with an h-index of over 39 (Science Citation Index) or over 51 (Google Scholar Citation Index). Over 17 of these publications have been cited over 100 times each. Publications are in the top 1% of most cited physics papers, according to the Physics Author Rank Algorithm.

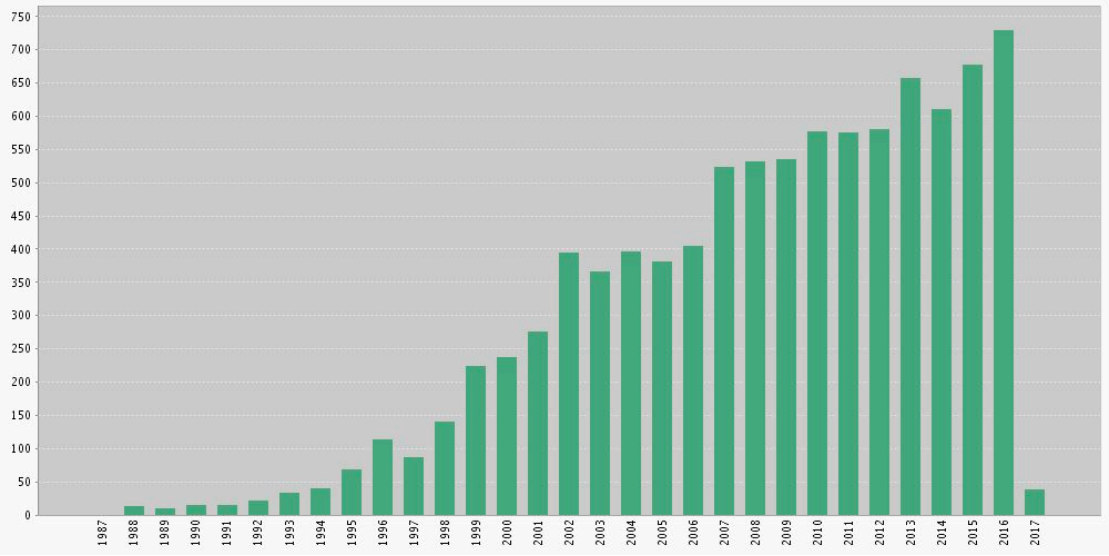
Chapters or Essays in Books

1. "Quantum optical technologies for metrology, sensing and imaging," Jonathan P. Dowling, Kaushik P. Seshadreesan, Invited paper for the Jounal of Lightwave Technology. IEEE/OSA Special Issue on the 23rd International Conference on OPTICAL FIBER SENSORS (OFS23). Journal of Lightwave Technology Vol. 33, Issue 12, pp. 2359-2370 (15 JUN 2015)
2. "Introduction to Boson Sampling," From Atomic to Mesoscale: The Role of Quantum Coherence in Systems of Various Complexities, Editors, Svetlana A. Malinovskaya, Irina Novikova, Publisher: World Scientific (2015).
3. "Photonic Crystals for Thermal Emissivity Control and Highly Efficient Solar Cell Systems," Marian Florescu, Hwang Lee, and Jonathan P. Dowling, invited chapter for: Handbook of Optical Materials, Devices and Systems, D. R. Vij, Editor (American Scientific Publishers, 2011).
4. "Quantum Entanglement in Optical Interferometry," Hwang Lee, Christoph F. Wildfeuer, Sean D. Huver, and Jonathan P. Dowling, invited chapter for: Handbook of Optics Third Edition, Michael Bass, Editor (Optical Society of America, 2010).
5. "Evanescent Light -Wave Atom Mirrors, Resonators, Waveguides, and Traps," Jonathan P. Dowling and Julio Gea-Banacloche, Advances in Atomic, Molecular, and Optical Physics, Vol. 36, edited by B. Bederson and H. Walther (Academic Press HBJ, Boston, 1996) 1-94.

Books & Journal Special Issues

1. Schrödinger's Kill App: Race to Build the World's First Quantum Computer, Jonathan P. Dowling (Published May 6th 2013 by Taylor & Francis – 453 pages).
2. Special Issue: Quantum Imaging, Dowling J, Gatti A, Sergienko A, Eds., Journal of Modern Optics 53 (5-6): Mar-Apr 2006.
3. Asim Orhan Barut Memorial Issue, Jonathan P. Dowling, Ed., Concepts of Physics, Volume II (2005), Number 3–4.
4. Special Issue on Single-Photon: Detectors, Applications, and Measurement Methods, Proceedings of the NIST-ARDA Workshop on Single-photon: Detectors, Applications and Measurement Methods, NIST, Gaithersburg, MD, 31 March-1 April 2003, Edited by Alan Migdall and Jonathan Dowling, Journal of Modern Optics 51 (9-10) (15 June - 10 July 2004).
5. Special Issue On Quantum Dots For Quantum Computing, Hideaki Matsueda and Jonathan P. Dowling, editors, Superlattice Microstructures 31 (2-4): 73-74 (February-April 2002).
6. Special Issue of Foundations of Physics in Memory of A. O. Barut, edited by Jonathan P. Dowling and Marlan O. Scully Foundations of Physics 28 (1 March-1 May 1998).
7. Electron Theory and Quantum Electrodynamics-100 Years Later, Proceedings of NATO Advanced Study Institute held in Edirne, Turkey, 5-16 September, 1994, edited by Jonathan P. Dowling (Plenum, New York, 1997) pp. 1-338.
8. Development and Applications of Materials Exhibiting Photonic Band Gaps, edited by Charles M. Bowden, Jonathan P. Dowling, and Henry O. Everitt, special issue of the Journal of the Optical Society of America B 10 (February 1993) 279-413.

Articles in Refereed Journals (LSU Grads Boldface & LSU Undergrads Boldface and Underlined)



Citations by Year (Web of Science)

1. Phase sensitivity at the Heisenberg limit in an SU(1,1) interferometer via parity detection By: Li, Dong; Gard, **Bryan T**.; Gao, Yang; et al. PHYSICAL REVIEW A Volume: 94 Issue: 6 Article Number: 063840 Published: DEC 19 2016.
2. Efficient recycling strategies for preparing large Fock states from single-photon sources: Applications to quantum metrology By: Motes, Keith R.; Mann, Ryan L.; Olson, Jonathan P.; et al. PHYSICAL REVIEW A Volume: 94 Issue: 1 Article Number: 012344 Published: JUL 27 2016
3. Quantum-enhanced spectroscopy with entangled multiphoton states By: Dinani, Hossein T.; **Gupta, Manish K.**; Dowling, Jonathan P.; et al. PHYSICAL REVIEW A Volume: 93 Issue: 6 Article Number: 063804 Published: JUN 7 2016
4. Sagnac interferometry with coherent vortex superposition states in exciton-polariton condensates By: Moxley, Frederick Ira, III; Dowling, Jonathan P.; Dai, Weizhong; et al. PHYSICAL REVIEW A Volume: 93 Issue: 5 Article Number: 053603 Published: MAY 4 2016
5. Quantum phase representation of Heisenberg limits and a minimally resourced quantum phase estimator; Shepard, Scott Roger; Moxley, Frederick Ira, III; Dowling, Jonathan P.; PHYSICAL REVIEW A Volume: 93 Issue: 3 Article Number: 033805 Published: MAR 2 2016
6. Spatial multimode structure of atom-generated squeezed light; Zhang, Mi; **Lanning, R. Nicholas; Xiao, Zhihao;** Dowling, Jonathan P.; Novikova, Irena; Mikhailov, Eugeniy E.; PHYSICAL REVIEW A Volume: 93 Issue: 1 Article Number: 013853 Published: JAN 28 2016
7. Implementing Boson Sampling with time-bin encoding: Analysis of loss, mode mismatch, and time jitter; Motes, Keith R.; Dowling, Jonathan P.; Gilchrist, Alexei; Rohde, Peter P.; PHYSICAL REVIEW A Volume: 92 Issue: 5 Article Number: 052319 Published: NOV 17 2015
8. Method for generating all uniform pi-pulse sequences used in deterministic dynamical decoupling; **Qi, Haoyu;** Dowling, Jonathan P.; PHYSICAL REVIEW A Volume: 92 Issue: 3 Article Number: 032303 Published: SEP 3 2015
9. Quantum Hall effect with small numbers of vortices in Bose-Einstein condensates; Byrnes, Tim; Dowling, Jonathan P.; PHYSICAL REVIEW A Volume: 92 Issue: 2 Article Number: 023629 Published: AUG 20 2015
10. The on-ramp to the all-optical quantum information processing highway; Rohde, Peter P.; Dowling, Jonathan P.; SCIENCE Volume: 349 Issue: 6249 Pages: 696-696 Published: AUG 14 2015
11. Non-Gaussian entangled states and quantum teleportation of Schrodinger-cat states; **Seshadreesan, Kaushik P.**; Dowling, Jonathan P.; Agarwal, Girish S.; PHYSICA SCRIPTA; Volume: 90 Issue: 7 Special Issue: SI; Article Number: 074029;Published: JUL 2015.
12. Linear Optical Quantum Metrology with Single Photons: Exploiting Spontaneously Generated Entanglement to Beat the Shot-Noise Limit; **Motes, Keith R.; Olson, Jonathan P.; Rabeaux, Evan J**.; Dowling, Jonathan P.; Olson, S. Jay; Rohde, Peter P.; PHYSICAL REVIEW LETTERS 114; 170802; APR 2015.

13. Preserving photon qubits in an unknown quantum state with Knill dynamical decoupling: Towards an all optical quantum memory; **Manish K. Gupta, Erik J. Navarro, Todd A. Moulder, Jason D. Mueller, Ashkan Balouchi,** Katherine L. Brown, Hwang Lee, and Jonathan P. Dowling; PHYSICAL REVIEW A 91; 032329; MAR 2015.
14. Reducing the number of ancilla qubits and the gate count required for creating large controlled operations; Brown KL; **Daskin A**; Kais S; Dowling JP; QUANTUM INFORMATION PROCESSING 14; 891-899 MAR 2015.
15. Boson sampling with displaced single-photon Fock states versus single-photon-added coherent states: The quantum-classical divide and computational-complexity transitions in linear optics; **Seshadreesan KP; Olson JP;** Motes KR; Rhode PP; Dowling JP; PHYSICAL REVIEW A 91; 022334; FEB 27 2015.
16. Improving photon detector efficiency using a high-fidelity optical controlled-NOT gate; Brown KL; **Singh R**; **Plaskus-Mendez JH**; Dowling JP; PHYSICAL REVIEW A 91; 022327; FEB 20 2015.
17. Coherent-state optical qudit cluster state generation and teleportation via homodyne detection; Kim J; Lee J; Ji, SW; Nha H; Anisimov PM; Dowling JP; OPTICS COMMUNICATIONS 337; 79-82; FEB 15 2015.
18. Optimized aperiodic multilayer structures for use as narrow-angular absorbers; **Granier CH**; **Afzal FO**; **Lorenzo SG;** Dowling JP; Veronis G; JOURNAL OF APPLIED PHYSICS 116; 243101; DEC 28 2014.
19. Scalable Boson Sampling with Time-Bin Encoding Using a Loop-Based Architecture; Motes KR.; Gilchrist A; Dowling JP; Rhode PP; PHYSICAL REVIEW LETTERS 113 120501; SEP 18 2014.
20. Optimized aperiodic highly directional narrowband infrared emitters; **Granier CH**; **Afzal FO**; Min CJ; Dowling JP; Veronis G; JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B 31; 1316-1321; JUN 2014.
21. Super-resolving single-photon number-path-entangled state and its generation; Feng W; **Jiang K**; **Lollie MLJ**; Zubairy MS; Dowling JP; Physical Review A 89; 043824; 2014.
22. Inefficiency of classically simulating linear optical quantum computing with Fock-state inputs; **Bryan T. Gard,** Robert M. Cross, Moochan B. Kim, Hwang Lee, Jonathan P. Dowling; Physical Review A 89; Article Number: 022328; FEB 18 2014.
23. Spontaneous parametric down-conversion photon sources are scalable in the asymptotic limit for boson sampling; Motes, Keith R.; Dowling, Jonathan P.; Rohde, Peter P.; Physical Review A 88; Article Number: 063822; DEC 10 2013.
24. Super-resolving quantum radar: Coherent-state sources with homodyne detection suffice to beat the diffraction limit; **Jiang, Kebei;** Lee, Hwang; Gerry, Christopher C.; Dowling, Jonathan P; Journal Of Applied Physics 114; Article Number: 193102; NOV 21 2013.
25. Dynamical decoupling with tailored wave plates for long-distance communication using polarization qubits; **Bardhan, Bhaskar Roy**; Brown, Katherine L.; Dowling, Jonathan P.; Physical Review A 88; Article Number 052311; NOV 11 2013.
26. Effects of phase fluctuations on phase sensitivity and visibility of path-entangled photon Fock states; **Bardhan BR**; **Jiang Kebei**; Dowling JP; Physical Review A 88; Article Number: 023857; AUG 29 2013.
27. Quantum random walks with multiphoton interference and high-order correlation functions; **Gard, Bryan T.**; **Cross, Robert M.**; Anisimov, Petr M.; Lee, Hwang; Dowling, Jonathan P.; JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS; Volume: 30; Pages: 1538-1545; Published: JUN 2013
28. Phase estimation at the quantum Cramer-Rao bound via parity detection; **Seshadreesan, Kaushik P.**; Kim, Sejong; Dowling, Jonathan P.; et al.; PHYSICAL REVIEW A; Volume: 87; Article Number: 043833; Published: APR 25 2013.
29. Quantum information transmission; Wang, Lei; Huang, Jie-Hui; Dowling, Jonathan P.; et al.; Quantum Information Processing; Volume: 12; Pages: 899-906 FEB 2013.
30. Quantum-Enhanced Magnetometer With Low-Frequency Squeezing; Horrom, T; **Singh, R**; Dowling, JP; Mikhailov, EE; Physical Review A; Volume: 86; Article Number: 023803; AUG 3 2012.
31. Strategies for choosing path-entangled number states for optimal robust quantum-optical metrology in the presence of loss; **Jiang, K**; **Brignac, CJ**.; **Weng, Y**; Kim, MB; Lee, H; Dowling, JP: Physical Review A; Volume: 86; Article Number: 013826; JUL 19 2012.

32. Thwarting The Photon-Number-Splitting Attack with Entanglement-Enhanced BB84 Quantum Key Distribution; **Sabottke, CF**; **Richardson, CD**; Anisimov, PM; Yurtsever, U; Lamas-Linares, A; Dowling, JP; Source: New Journal of Physics; Volume: 14; Article Number: 043003; APR 5 2012.
33. Popper's Thought Experiment Reinvestigated; **Richardson, CD**; Dowling, JP; International Journal of Quantum Information; Volume: 10; Article Number: 1250033; APR 2012.
34. Ultra-Stable Matter–Wave Gyroscopy with Counter-Rotating Vortex Superpositions In Bose–Einstein Condensates; Thanvanthri, S; Kapale, KT; Dowling, JP; Journal of Modern Optics; Volume: 59; Pages: 1180–1185; JUL 2012.
35. Single and Biphoton Imaging and High Dimensional Quantum Communication; Howell, JC; Anisimov, PM; Dowling, JP; et al.; Quantum Information Processing; Volume 11; Pages: 925-948; AUG 2012.
36. Quantum Lithography: Status of the Field; Boyd, RW; Dowling, JP; Quantum Information Processing; Volume: 11; Pages: 891-901; AUG 2012.
37. Dynamical Decoupling in Optical Fibers: Preserving Polarization Qubits From Birefringent Dephasing; **Bardhan, BR**; Anisimov, PM; **Gupta, MK**; Brown, KL; Jones, NC; Lee, H; Dowling, JP; Physical Review A Volume: 85 Issue: 2 Article Number: 022340; FEB 28 2012.
38. Sete, EA; Dorfman, KE; Dowling, JP; Phase-Controlled Entanglement In A Quantum-Beat Laser: Application To Quantum Lithography; Journal Of Physics B-Atomic Molecular And Optical Physics; Volume: 44; Article Number: 225504; NOV 28 2011.
39. Anisimov, PM; Dowling, JP; Sanders, BC; Objectively Discerning Autler-Townes Splitting from Electromagnetically Induced Transparency; Physical Review Letter; Volume: 107; Article Number: 163604; 2011).
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Other Publications (Preprints and Papers Under Review)

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2. arXiv:1702.05533; Optimal digital dynamical decoupling for general decoherence via Walsh modulation; **Haoyu Qi,** Jonathan P. Dowling, Lorenza Viola
3. arXiv:1703.03818; Why a hole is like a beam splitter--a general diffraction theory for multimode quantum states of light, **Zhihao Xiao, R. Nicholas Lanning,** Mi Zhang, Irina Novikova, Eugeniy E. Mikhailov, Jonathan P. Dowling
4. arXiv:1703.01566; Modeling the atomtronic analog of an optical polarizing beam splitter, a half-wave plate, and a quarter-wave plate for phonons of the motional state of two trapped atom; Naieme Mohseni, Marjan Fani, Jonathan P. Dowling, Shahpoor Saeidian
5. arXiv:1610.07128; Linear optical quantum metrology with single photons --- Experimental errors, resource counting, and quantum Cramér-Rao bounds; **Jonathan P. Olson**, Keith R. Motes, Patrick M. Birchall, **Nick M. Studer, Margarite LaBorde, Todd Moulder,** Peter P. Rohde, Jonathan P. Dowling
6. arXiv:1609.02780; Enhanced Thermal Object Imaging by Photon Addition or Subtraction; Claudio Parazzoli, Benjamin Koltenbah, David Gerwe, Paul Idell, Bryan Gard, Richard Birrittella, S M Hashemi Rafsanjani, Mohammad Mirhosseini, O S Magan-Loiza, Jonathan Dowling, Christofer Gerry, Robert Boyd, Barbara Capron
7. arXiv:1607.04960; A Quantum Optics Argument for the #P-hardness of a Class of Multidimensional Integrals; Peter P. Rohde, Dominic W. Berry, Keith R. Motes, Jonathan P. Dowling
8. arXiv:1609.04689; Adaptive phase estimation with two-mode squeezed-vacuum and parity measurement; Zixin Huang, Keith R. Motes, Petr M. Anisimov, Jonathan P. Dowling, Dominic W. Berry
9. arXiv:1606.09598; Photon Added Coherent States: Nondeterministic, Noiseless Amplification in Quantum Metrology; Bryan T. Gard, Dong Li, Chenglong You, Kaushik P. Seshadreesan, Richard Birrittella, Jerome Luine, Seyed Mohammad Hashemi Rafsanjani, Mohammad Mirhosseini, Omar S.Magaña-Loaiza, Benjamin E. Koltenbah, Claudio G. Parazzoli, Barbara A. Capron, Robert W. Boyd, Christopher C. Gerry, Hwang Lee, Jonathan P. Dowling
10. arXiv:1605.05424 ; Interferometry with Photon-Subtracted Thermal Light; Seyed Mohammad Hashemi Rafsanjani, Mohammad Mirhosseini, Omar S. Magana-Loaiza, Bryan T. Gard, Richard Birrittella, B. E. Koltenbah, C. G. Parazzoli, Barbara A. Capron, Christopher C. Gerry, Jonathan P. Dowling, Robert W. Boyd
11. arXiv:1605.03911 ; Nearly Optimal Measurement Scheme in a Noisy Mach-Zehnder Interferometer with Coherent and Squeezed Vacuum; Bryan T. Gard, Chenglong You, Devendra K. Mishra, Robinjeet Singh, Hwang Lee, Thomas R. Corbitt, Jonathan P. Dowling
12. arXiv:1309.5359; Spontaneous Emission from a Two-Level Atom in a Rectangular Waveguide; Moochan B. Kim, Georgios Veronis, Tae-Woo Lee, Hwang Lee, Jonathan P. Dowling.
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17. Dowling, JP; Quantum optics - Kittens catch phase, Nature, 450 (7168): 362-363 NOV 15 2007 (News and Views article, invited).
18. Dowling JP, Quantum information - To compute or not to compute? Nature 439 (7079): 919-920 FEB 23 2006 (News and Views article, invited).
19. "Quantum Computing, Metrology, and Imaging," Hwang Lee, Pavel Lougovski, Jonathan P. Dowling, *Proc. SPIE,* Vol. 5842, *Fluctuations and Noise in Photonics and Quantum Optics III;* Philip R. Hem-

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24. "Quantum Lithography," Pieter Kok, Samuel L. Braunstein, and Jonathan P. Dowling, Optics & Photonics News (September 2002) 24-27 (Invited New Article).
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27. "Mirror on the Wall: You're Omnidirectional After All?" Jonathan P. Dowling, Science 282, (04 December 1998) 1841-1842 (Perspectives Article, invited).
28. "One-dimensional, thin-film, photonic band-gap materials for IR emissivity control," Jonathan P. Dowling, Mark J. Bloemer, Michael D. Tocci, Michael Scalora, and Charles M. Bowden, the proceedings of the 1997 meeting of the IRIS Specialty Group on Camouflage, Concealment, and Deception, Vol. I (Infrared Information Analysis Center, Ann Arbor, 1998) pp. 39-47 (un-refereed conference proceeding).
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35. "Local Field Effects in Nonlinear and Quantum Optics," Charles M. Bowden, Aaron S. Manka, Jonathan P. Dowling, and Michael Fleischhauer, in the Proceedings of the Seventh Rochester Conference:

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39. "Near Dipole-Dipole Effects in Nonlinear and Quantum Optics with Applications to Piezophotonic Switching," Charles M. Bowden, Jonathan P. Dowling, Aaron S. Manka and Michael Fleischhauer, in the Proceedings of the Sixth International Symposium: Quantum Optics, held in Rotorua, New Zealand, 24-28 January 1994, edited by D. F. Walls and J. D. Harvey (Springer, Berlin, 1994) pp. 296-305 (un-refereed conference proceeding, invited).
40. "Quantum Noise Limits to Matter-Wave Interferometry," M. O. Scully and J. P. Dowling, in the Proceedings of the Third Workshop: Squeezed States and Uncertainty Relations, held at University of Maryland in Baltimore County, Baltimore, Maryland, 10-13 August 1993, edited by M. H. Rubin and Y. Shih (NASA Conference Publication 3270, Goddard Spaceflight Center, 1994) pp. 475-484 (un-refereed conference proceeding, invited).
41. "Totally Phased," Jonathan P. Dowling, New Scientist 137 (13 March 1993) 55 (letter to the editor).
42. "Wigner Functions for Nonclassical States of a Collection of Two-Level Atoms," G. S. Agarwal, Jonathan P. Dowling, and Wolfgang P. Schleich, in the Proceedings of the Second Workshop: Squeezed States and Uncertainty Relations, held in Moscow, Russia, 24-29 May 1992, edited by Y. S. Kim and V. I. Man'ko (NASA Conference Publication 3219, Goddard Spaceflight Center, 1993), pp. 329-340 (un-refereed conference proceeding, invited).
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48. "Quantum Electrodynamics Based on Self-Fields: Cavity Effects," Jonathan P. Dowling, in the Proceedings of the NATO Advance Study Institute: New Frontiers in Quantum Electrodynamics and Quantum Optics, held in Istanbul, Turkey, 14-26 August 1989, edited by A. O. Barut (Plenum, New York, 1990), pp. 371-378 (un-refereed conference proceeding, invited).
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Patents

1. "Photonic crystal architectures for frequency and angle selective thermal emitters, "Marian Florescu, Hwang Lee, and Jonathan P. Dowling, US Application No. 61030610, 28 February 2009.
2. "Lithography Using Quantum Entangled Particles," Colin Williams, Jonathan P. Dowling, and Giovanni della Rossa, US Patent No. 6630290, issued 07 October 2003.
3. "Lithography Using Quantum Entangled Particles," C. P. Williams and J. P. Dowling, US Patent No. 6583881, issued 24 June 2003.
4. "Optical Switch that Utilizes One-Dimensional, Nonlinear, Multilayer Dielectric Stacks", Michael Scalora, Jonathan P. Dowling, C. M. Bowden, Mark J. Bloemer, and Michael D. Tocci, US Patent No. 5 740 287, issued 14 April 1998.
5. "Photonic Band Edge Optical Diode," Michael Scalora, Jonathan P. Dowling, Mark J. Bloemer, and Charles M. Bowden, US Patent No. 5 559 825, issued 24 September 1996.
6. "Photonic band-gap apparatus and method for delaying photonic signals," Jonathan P. Dowling, Michael Scalora, Mark J. Bloemer, Charles M. Bowden, Rachel J. Flynn, Richard L. Fork, Senter B. Reinhardt, Michael D. Tocci, US Patent No. 5 751 466, issued 12 May 1998.
7. "Lithography Using Quantum Entangled Particles," Colin Williams and Jonathan P. Dowling, US Patent No. 6252665, issued 26 June 2001.
8. "Lithography System Using Quantum Entangled Photons," Colin Williams, Jonathan P. Dowling, and Giovanni Della Rossa, US Patent No. 6480283, issued 12 November 2002.
9. "Photonic Band Gap Dual-Spectrum Sensor," M. J. Bloemer, M. Scalora, J. P. Dowling, C. M. Bowden, and W. C. Pittman, US Patent No. 6392782, issued 21 May 2002.

Co-Authored and Invited Presentations at Technical Conferences and Workshops (2016 Highlighted)
LSU Graduate Student Presenters in Boldface and Undergraduates Boldface & Underlined)

1. "Generation and multi-pass propagation of a squeezed vacuum field in hot Rb vapor," Mi Zhang, **R. Nicholas Lanning, Zhihao Xiao,** Jonathan P. Dowling, Irina Novikova, Eugeniy E. Mikhailov, American Physical Society March Meeting 2016, March 14–18, 2016; Baltimore, Maryland.
2. "Saving entangled photons from sudden death in a single-mode fiber ---- Interplay of decoherence and dynamical decoupling, **Manish K. Gupta, Chenglong You,** Jonathan P. Dowling, Hwang Lee, American Physical Society March Meeting 2016, March 14–18, 2016; Baltimore, Maryland.
3. "Modelling Spatial Modes of Squeezed Vacuum," **R. Nicholas Lanning, Zhihao Xiao,** Mi Zhang, Irina Novikova, Eugeniy Mikhailov, Jonathan P. Dowling, American Physical Society March Meeting 2016, March 14–18, 2016; Baltimore, Maryland.
4. "Method for generating all uniform π-pulse sequences used in deterministic dynamical decoupling," **Haoyu Qi,** Jonathan P. Dowling, American Physical Society March Meeting 2016, March 14–18, 2016; Baltimore, Maryland.
5. "Second quantization of propagation of light through Rb vapor," **Zhihao Xiao, R. Nicholas Lanning**, Mi Zhang, Irina Novikova, Eugeniy E. Mikhailov, Jonathan P. Dowling American Physical Society March Meeting 2016, March 14–18, 2016; Baltimore, Maryland
6. "Optimal Architectures for Single Photon Metrology," **Margarite L. LaBorde, Jonathan P. Olson,** Keith R. Motes, Patrick Birchall, **Nick M. Studer**, **Todd Moulder**, Peter P. Rohde, Jonathan Dowling, Frontiers in Optics: The 100th OSA Annual Meeting and Exhibit/Laser Science XXXII, 17 Oct 2016 - 21 Oct 2016, Rochester, New York.
7. "Numerical Algorithm for Finding Optimal Experimental Setup for Arbitrary Unitary Operator," **Sushovit Adhikari,** Jonathan P. Dowling, Frontiers in Optics: The 100th OSA Annual Meeting and Exhibit/Laser Science XXXII, 17 Oct 2016 - 21 Oct 2016, Rochester, New York.
8. "Optimized Mid-Infrared Thermal Emitters for Applications in Aircraft Countermeasures," **Simon Lorenzo, Chenglong You**, Georgios Veronis, Jonathan P. Dowling, Frontiers in Optics: The 100th OSA Annual Meeting and Exhibit/Laser Science XXXII, 17 Oct 2016 - 21 Oct 2016, Rochester, New York.
9. "Modelling Spatial Modes of Squeezed Vacuum," **R. Nicholas Lanning, Zhihao Xiao,** Mi Zhang, Irina Novikova, Eugeniy Mikhailov, Jonathan P. Dowling, 47th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, May 23–27, 2016; Providence, Rhode Island.
10. "Saving entangled photons from sudden death is a single-mode fiber — Interplay of Decoherence and dynamical decoupling," **Manish K. Gupta, Chenglong You,** Jonathan P. Dowling, Hwang Lee, 47th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, May 23–27, 2016; Providence, Rhode Island.

11. "Generation and multi-pass propagation of a squeezed vacuum field in hot Rb vapor," Mi Zhang, **R. Nicholas Lanning, Zhihao Xiao,** Jonathan P. Dowling, Irina Novikova, Eugeniy E. Mikhailov, 47th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, May 23–27, 2016; Providence, Rhode Island.
12. "Squeezed Light in Laguerre-Gaussian Modes through Non-linear Medium," **Zhihao Xiao, R. Nicholas Lanning**, Mi Zhang, Irina Novikova, Eugeniy E. Mikhailov, Jonathan P. Dowling, 47th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, May 23–27, 2016; Providence, Rhode Island.
13. "Solving the quantum brachistochrone equation through differential geometry," **Chenglong You**, Mark Wilde, Jonathan P. Dowling, Xiaoting Wang, 47th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, May 23–27, 2016; Providence, Rhode Island.
14. "General Theory of Photon Detection," Jonathan P. Dowling, DARPA DETECT Theory Workshop, 30 AUG 2016, Arlington, VA (invited).
15. "Linear optical quantum metrology with single photons — Experimental errors, resource counting, and quantum Cramér-Rao bounds," Jonathan P. Dowling, 4th International Conference on Quantum Foundation and Technology: Frontier and Future (ICQFT2016); University of Science and Technology of China (USTC) at Shanghai, China November 12-17, 2016 (invited, plenary).
16. "Inefficiency of Classically Simulating Linear Optical Quantum Computers with Fock State Inputs," Jonathan P. Dowling, International Conference on the Frontiers in Atomic, Molecular, and Optical Physics, May 23 - 26 | 2016, Shanghai | China (invited).
17. "Inefficiency of Classically Simulating Linear Optical Quantum Computers with Fock State Inputs," Jonathan P. Dowling, First Workshop on Multi-Photon Interferometry, Shanghai, China, May 2015 (invited).
18. "Boson Sampling and Related Technologies," Jonathan P. Dowling, CSSQI 2015: Canadian Summer School on Quantum Information, 10 Aug 2015 - 14 Aug 2015, The Fields Institute at the University of Toronto, Toronto, Canada (invited).
19. "Quantum Optical Technologies for Sensing," Annual symposium on Guidance/Nav/Controls, Draper Laboratories in Cambridge, MA – May 14/15 (invited).
20. "Generation of multi-spatial mode squeezed vacuum," **R. Nicholas Lanning, Zhihao Xiao**, Mi Zhang, Irina Novikova, Eugeniy E. Mikhailov, Jonathan P. Dowling, Joint Spring 2016 Meeting of the Texas Sections of APS, AAPT, and Zone 13 of the SPS; March 31–April 2 2016; Beaumont, Texas.
21. "Second quantization of propagation of light through Rb vapor," **Zhihao Xiao**, **R. Nicholas Lanning,** Mi Zhang, Irina Novikova, Eugeniy E. Mikhailov, Jonathan P. Dowling, APS March Meeting 2016; March 14–18, 2016; Baltimore, Maryland
22. "Generation and multi-pass propagation of a squeezed vacuum field in hot Rb vapor," Mi Zhang, **Zhihao Xiao**, **R. Nicholas Lanning,** Irina Novikova, Eugeniy E. Mikhailov, Jonathan P. Dowling, APS March Meeting 2016; March 14–18, 2016; Baltimore, Maryland
23. "Modelling Spatial Modes of Squeezed Vacuum," **R. Nicholas Lanning, Zhihao Xiao**, Mi Zhang, Irina Novikova, Eugeniy E. Mikhailov, Jonathan P. Dowling, APS March Meeting 2016; March 14–18, 2016; Baltimore, Maryland
24. "Spatial Structure of Quantum Noise in Squeezed Vacuum Field," Mi Zhang, **R. Nicholas Lanning, Zhihao Xiao,** Jonathan P. Dowling Irina Novikova, Eugeniy E. Mikhailov, 46th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics; June 8–12, 2015; Columbus, Ohio.
25. "Multiplexing OAM states in an optical fiber: Increase bandwidth of quantum communication and QKD applications," **Manish K. Gupta** and Jonathan P. Dowling; 46th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics; June 8–12, 2015; Columbus, Ohio.
26. "New Techniques for Laser Cooling and Trapping," **Robinjeet Singh,** Sai Vinjanampathy, Petr Anisimov, Harold Metcalf, Jonathan P. Dowling; 46th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics; June 8–12, 2015; Columbus, Ohio.
27. "Preserving photon qubits in an unknown quantum state with Knill Dynamical Decoupling -- Towards an all optical quantum memory," **Manish K. Gupta, Erik J. Navarro, Todd A. Moulder, Jason D. Mueller, Ashkan Balouchi,** Katherine L. Brown, Hwang Lee, Jonathan P. Dowling; 46th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics; June 8–12, 2015; Columbus, Ohio.

28. "Quantum Technologies for Sensing, Metrology, and Imaging," Jonathan P. Dowling, Northrop Grumman Aerospace Quantum Sensing, Metrology, and Algorithms Workshop, 8–9 December 2014 (Space Park, Redondo Beach, CA); invited.
29. "Preserving photon qubits in an unknown quantum state with Knill Dynamical Decoupling - Towards an all optical quantum memory," **Manish K. Gupta**, **Erik J. Navarro**, **Todd A. Moulder**, **Jason D. Mueller**, **Ashkan Balouchi**, Katherine L. Brown, Hwang Lee, Jonathan P. Dowling, APS March Meeting 2015, Volume 60, Number 1 (March 2–6, 2015; San Antonio, Texas).
30. "Second quantization of squeezed light through non-linear medium," **Zhihao Xiao, R. Nicholas Lanning, Mi Zhang,** Irina Novikova, Eugeniy E. Mikhailov, Jonathan P Dowling, APS March Meeting 2015, Volume 60, Number 1 (March 2–6, 2015; San Antonio, Texas).
31. "Spatial Modes of a Squeezed Vacuum Field," **Mi Zhang, R. Nicholas Lanning, Zhihao Xiao,** Jonathan P. Dowling, Irina Novikova, Eugeniy E. Mikhailov, APS March Meeting 2015, Volume 60, Number 1 (March 2–6, 2015; San Antonio, Texas).
32. "Modelling Spatial Modes of Squeezed Vacuum -- When it Comes to Squeezing, Plane Waves Are Just Too Plain," **R. Nicholas Lanning, Zhihao Xiao, Mi Zhang,** Irina Novikova, Eugeniy E. Mikhailov, Jonathan P. Dowling, APS March Meeting 2015, Volume 60, Number 1 (March 2–6, 2015; San Antonio, Texas).
33. "Boson Sampling with Non-Fock States," **Keith R. Motes,** Peter P. Rohde, **Kaushik P. Seshadreesan, Jonathan P. Olson,** Paul A. Knott, William J. Munro, and Jonathan P. Dowling, the 45th Winter Colloquium on the Physics of Quantum Electronics (4–8 January 2015, Snowbird, UT); invited.
34. "The computational complexity of passive linear optics," Jonathan P. Dowling, the 45th Winter Colloquium on the Physics of Quantum Electronics (4–8 January 2015, Snowbird, UT); plenary and invited.
35. "Exploiting Boson Probability Distributions in Staggered Beam Splitter Arrays," **Todd Moulder**, the 45th Winter Colloquium on the Physics of Quantum Electronics (4–8 January 2015, Snowbird, UT).
36. "Classical Computers Very Likely Can Not Efficiently Simulate Multimode Linear Optical Interferometers with Arbitrary Fock-State Inputs --- An Elementary Argument," **Bryan T. Gard, Jonathan P. Olson,** Robert Cross, Moochan Kim, Hwang Lee, Jonathan Dowling, 45th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, June 2–6, 2014; Madison, Wisconsin.
37. "Super-resolving single-photon number-path-entangled state and its generation," **Michelle L.-J. Lollie**, **Wei Feng; Kebei Jiang**; M. Suhail Zubairy; Jonathan Dowling, Frontiers in Optics/Laser Science, 19-23 October 2014, Tucson, AZ.
38. "An Introduction to Boson Sampling," Jonathan P. Dowling, A topical workshop held at the Institute for Theoretical Atomic, Molecular, and Optical Physics (ITAMP), Cambridge, Massachusetts, USA on March 10–12, 2014. The title of the workshop was, "From atomic to mesoscale: the role of quantum coherence in systems of various complexities." (invited).
39. "Quantum technologies for optical sensing, metrology and imaging," Jonathan P. Dowling, OFS23 (23rd International Conference on Optical Fiber Sensors), 2–6 June 2014, Santander, Spain (invited plenary).
40. "Boson sampling with photon-added coherent states," **Jonathan P. Olson, Kaushik P. Seshadreesan**, Keith Motes, Peter Rohde, Jonathan Dowling, 45th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, June 2–6, 2014; Madison, Wisconsin.
41. "Linear Optical Quantum Information Processing, Sensing, and Imaging," Jonathan P. Dowling, Symposium on New Frontiers of Quantum Photonic Networks, 06–07 November 2013, National Institute of Information and Communications Technology, Tokyo, Japan (invited).
42. "Classical Computers Can Not Efficiently Simulate Multi-mode Linear Optical Interferometers with Arbitrary Fock-State Inputs," Jonathan P. Dowling, Coherence and Quantum Optics / Quantum Information and Measurement Conferences, 17–19 June 2013, Rochester, NY (invited).
43. "Classical Computers Can Not Efficiently Simulate Multi-mode Linear Optical Interferometers with Arbitrary Fock-State Inputs," Jonathan P. Dowling, Quantum Optics and New Materials, 26–30 May 2013, Beijing, China (invited).
44. "Coherently generated of vortex super-positions in Bose-Einstein Condensates and their applications," **Kishor T. Kapale,** Jonathan P. Dowling, Coherence and Quantum Optics / Quantum Information and Measurement Conferences, 17–19 June 2013, Rochester, NY.
45. "Effects of Phase Fluctuations on the Sensitivity of NOON State in a Noisy Environment," **Bhaskar Roy Bardhan**, Jonathan P. Dowling, Coherence and Quantum Optics / Quantum Information and Measurement Conferences, 17–19 June 2013, Rochester, NY.

46. "Path-Symmetric States and Parity Detection in Quantum Optical Interferometry," **Kaushik P. Seshadreesan**, Sejong Kim, **Bhaskar Roy Bardhan**, Jonathan P. Dowling, Hwang Lee, Coherence and Quantum Optics / Quantum Information and Measurement Conferences, 17–19 June 2013, Rochester, NY.
47. "Super-Resolving Quantum Radar: Coherent-State Sources with Homodyne Detection Suffice to Beat the Diffraction Limit," Jonathan P. Dowling, **Kebei Jiang**, Hwang Lee, Christopher C. Gerry, Coherence and Quantum Optics / Quantum Information and Measurement Conferences, 17–19 June 2013, Rochester, NY.
48. "Quantum Technology: The Second Quantum Revolution," Jonathan P. Dowling, Institute of Physics Topical Research Meetings on Physics: Quantum Technologies, 17 December 2012, London, UK (invited, keynote).
49. "Two Level Atom in Bichromatic Field: Von Neumann Entropy and Laser Cooling," **Robinjeet Singh,** Petr Anisimov, Moochan B. Kim, Harold Metcalf, Hwang Lee, and Jonathan P. Dowling, Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 04–08 June 2012, Orange County, CA.
50. "Investigation for the Macroscopic Quantum Electrodynamics to Describe Light in Dielectric Material," Moochan B. Kim, Tae-Woo Lee, Georgios Veronis, Hwang Lee, Jonathan P. Dowling, Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 04–08 June 2012, Orange County, CA.
51. "Investigating the Possibility of Overcoming Photon Loss via Photon-Phonon Interactions," **Bhaskar R. Bardhan** & Jonathan P. Dowling, Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 04–08 June 2012, Orange County, CA.
52. "Quantum Random Walks With Multiphoton Interference and High Order Correlation Functions," **Bryan T. Gard, Robert M. Cross**, Petr M. Anisimov, Hwang Lee, and Jonathan P. Dowling, Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 04–08 June 2012, Orange County, CA.
53. "Improved Optical Magnetometer Based on Electromagnetically Induced Transparency in a Ring-Cavity Setup," **Bhaskar R. Bardhan,** Moochan B. Kim, Jonathan P. Dowling, Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 04–08 June 2012, Orange County, CA.
54. "Super-Resolution at the Quantum Limit with Coherent Light and a Homodyne-Based Parity Detection Scheme," **Kaushik P. Seshadreesan**, Petr M. Anisimov, Hwang Lee, and Jonathan P. Dowling, Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 04–08 June 2012, Orange County, CA.
55. "Path Entangled Photon Number States in the Presence of Loss for Quantum Metrology," **Chase J. Brignac, Kebei Jiang, Yi Weng,** Jonathan P. Dowling Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 04–08 June 2012, Orange County, CA.
56. "Quantum Cramer-Rao Bound for M&M' States with Lossy Interferometers," **Yi Weng,** Moochan B. Kim, Hwang Lee, and Jonathan P. Dowling, Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 04–08 June 2012, Orange County, CA.
57. "Fringe visibility and Which-Way information for Robust Entangled Fock states," **Kebei Jiang**, Moochan B. Kim, **Chase J. Brignac**, Hwang Lee, and Jonathan P. Dowling, Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 04–08 June 2012, Orange County, CA.
58. "Using a CNOT Gate to Improve Detector Efficiency," Katherine L. Brown, Ben Fortescue, Moochan B. Kim, **Christopher D. Richardson**, Jonathan P. Dowling, Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 04–08 June 2012, Orange County, CA.
59. "Phase Estimation with Two-Mode Squeezed Vacuum and Parity Detection: Bayesian Analysis," **Keith R. Motes**, Petr M. Anisimov, Jonathan P. Dowling, Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 04–08 June 2012, Orange County, CA.
60. "Thwarting The Photon Number Splitting Attack With Entanglement-Enhanced BB84 Quantum Key Distribution," **Carl F. Sabottke**, **Christopher D. Richardson**, and Jonathan P. Dowling, Quantum Information and Computation X Session, SPIE Defense Security and Sensing Conference 23–27 April 2012, Baltimore, MD.
61. "Thwarting The Photon Number Splitting Attack With Entanglement-Enhanced BB84 Quantum Key Distribution," **Christopher D. Richardson, Carl F. Sabottke**, Jonathan P. Dowling, Petr M. Anisimov, Ulvi Yurtsever, and Antia Lamas-Linares, Quantum Information and Measurement, 12 March 2012, Berlin, Germany.

62. "Popper's Thought Experiment Revisited," **Christopher D. Richardson** and Jonathan P. Dowling, American Physical Society March Meeting, 27 February – 02 March 2012, Boston, MA.
63. "Quantum Sensors, Metrology, and Imaging," Jonathan P. Dowling, First NASA Quantum Future Technologies Conference, 17–21 January 2012, San Jose, CA (invited).
64. "Dynamical Decoupling in Optical Fibers: Preserving Polarization Qubits from Birefringent Dephasing," Jonathan P. Dowling, Croucher ASI on Dynamical Control of Quantum Coherence for Current and Future Information Technologies, 5–10 December 2011, Hong Kong, SAR, PRC (invited).
65. "Quantum Optical Metrology, Imaging, and Computing," Jonathan P. Dowling, Quantum Optics and New Materials (IV), 27–30 January 2011, Beijing (invited).
66. "Dynamical Decoupling in Optical Fibers: Preserving Polarization Qubits from Birefringent Dephasing, **Bhaskar Roy Bardhan,** Petr A. Anisimov, **Manish K. Gupta,** Nathan Cody Jones, Hwang Lee, Jonathan P. Dowling, Frontiers in Optics / Laser Science XXVII, 16–20 October 2011, San Jose, CA.
67. "Parity Detection for Heisenberg-limited Metrology with Coherent and Squeezed Vacuum Light," **Kaushik P. Seshadreesan**, Petr A. Anisimov, Hwang Lee, Jonathan P. Dowling, Frontiers in Optics / Laser Science XXVII, 16–20 October 2011, San Jose, CA.
68. "Quantum Random Walks with Multiple Photons," **Robert M. Cross, Bryan T. Gard,** Petr Anisimov, Jonathan P. Dowling, Frontiers in Optics / Laser Science XXVII, 16–20 October 2011, San Jose, CA.
69. Katherine L. Brown, ICQI
70. Katherine L. Brown, CLEO
71. "Quantum Sensors, Computing, Metrology, and Imaging," Jonathan P. Dowling, Quantum Electronics and Laser Science, 1–6 May 2011, Baltimore, Maryland (invited).
72. "Quantum Optical Computing, Imaging, and Metrology," Jonathan P. Dowling, Physics of Quantum Electronics, 2–6 January 2011, Snowbird, Utah (invited).
73. "Quantum Computing, Metrology, and Imaging," Jonathan P. Dowling, Asian Conference on Quantum Information Science, 27-31 August 2010, Tokyo, Japan (invited).
74. "Quantum Computing, Metrology, and Imaging," Jonathan P. Dowling, Frontiers of Nonlinear Physics, 13-21 July 2010, Nizny Novgorod, Russia (invited).
75. "Methods of Entangling Large Numbers of Photons for Enhanced Phase Resolution," Jonathan P. Dowling, invited, Office of Naval Research Workshop on Entanglement, 8–11 February 2010, Santa Ana, CA.
76. "Signal-to-noise ratio of quantum imaging using entangled photon-number state," **Sai Vinjanmanpthy**, Jeff Adams, Barbara Capron, Claudio Parazzoli, Jonathan Dowling, 41st Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 25–29 May 2010, Houston, Texas.
77. "Sub-Heisenberg limited phase measurement with two-mode squeezed vacuum," **Gretchen M. Raterman**, Petr M. Anisimov, **Aravind Chiruvelli**, **William N. Plick**, **Sean D. Huver**, Hwang Lee, Jonathan P. Dowling, 41st Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 25–29 May 2010, Houston, Texas.
78. "Decomposition and Schematic Construction of Higher-Dimensional Unitary Transformations," **Blane McCracken**, Tae-Woo Lee, Changjun Min, Jonathan Dowling, 41st Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 25–29 May 2010, Houston, Texas.
79. "Phase measurement with two-mode squeezed vacuum in the presence of loss," Petr Anisimov and Jonathan Dowling, 41st Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 25–29 May 2010, Houston, Texas.
80. "The Invisible Quantum Tripwire: Analysis in the Presence of Photon Loss," **Daniel Lum**, Petr Anisimov, **S. Blane McCracken**, and Jonathan Dowling, 41st Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 25–29 May 2010, Houston, Texas.
81. "Coherent-Light Boosted, Super-Sensitive, Quantum Interferometery," **William N. Plick**, Jonathan P. Dowling, Girish S. Agarwal, 41st Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 25–29 May 2010, Houston, Texas.
82. "Optimization of Linear Optical Quantum Computing Circuits," Jonathan P. Dowling, SPIE Photonics West: Advances in Photonics of Quantum Computing, Memory, and Communication III, 23–28 January 2010, San Jose, California (invited).
83. "Quantum Tripwire," Petr M. Anisimov, **Blane McCracken**, **Daniel Lum**, Jonathan P. Dowling, SPIE Photonics West: Advances in Photonics of Quantum Computing, Memory, and Communication III, 23–28 January 2010, San Jose, California.

84. "Entanglement-Boosted Bright-Source Interferometry," **William N. Plick**, Petr M. Anisimov, Jonathan P. Dowling, SPIE Photonics West: Advances in Photonics of Quantum Computing, Memory, and Communication III, 23–28 January 2010, San Jose, California.
85. "Optimization of States in a Lossy Interferometer," **Blane McCracken**, Tae-Woo Lee, **Sean D. Huver**, Lev Kaplan, Hwang Lee, Chang-Jun Min, Dmitry B. Uskov, Christoph F. Wildfeuer, Georgios Veronis, Jonathan P. Dowling, Single Photon Workshop, 3–6 November 2009, Boulder, Colorado.
86. "Sub-Heisenberg limited phase measurement with two-mode squeezed light," Petr M. Anisimov, **Gretchen M. Raterman, Aravind Chiruvelli, William N. Plick, Sean D. Huver,** Hwang Lee, Jonathan P. Dowling, Single Photon Workshop, 3–6 November 2009, Boulder, Colorado.
87. "The Quantum Tripwire: Analysis in the Presence of Photon Loss," **Daniel J. Lum, S. Blane McCracken,** Petr M. Anisimov, Jonathan P. Dowling Jonathan P. Dowling, Single Photon Workshop, 3–6 November 2009, Boulder, Colorado.
88. "Quantum Interferometric Sensing," Jonathan P. Dowling, Applied Atom Optics Conference, 27–29 July 2009, Bad Honnef, Germany (invited).
89. "Quantum Computing, Metrology, and Sensing," Jonathan P. Dowling, LPHYS09, 13–17 July 2009, Barcelona, Spain (invited).
90. "Optimization of States in a Lossy Interferometer," **Blane McCracken**, Tae-Woo Lee, **Sean D. Huver**, Lev Kaplan, Hwang Lee, Chang-Jun Min, Dmitry B. Uskov, Christoph F. Wildfeuer, Georgios Veronis, Jonathan P. Dowling, 40th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 19–23 May 2009, Charlottesville, VA.
91. "Interferometry with a Photon-Number Resolving Detector," Christoph F. Wildfeuer, Aaron Pearlman, Jun Chen, Jing-Yun Fan, Alan Migdall, Jonathan P. Dowling, 40th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 19–23 May 2009, Charlottesville, VA.
92. "Two-photon Absorption of Path-Entangled Number States," Petr Anisimov, **William N. Plick**, Christoph F. Wildfeuer, Hwang Lee, Jonathan P. Dowling, 40th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 19–23 May 2009, Charlottesville, VA.
93. "Ultra-Stable Matter Wave Gyroscopy using Orbital Angular Momentum Induced Atomic Vortices," Sulakshana Thanvanthri, Kishore T. Kapale, Jonathan P. Dowling, 40th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, 19–23 May 2009, Charlottesville, VA.
94. "Quantum Computing, Metrology, and Sensing" Jonathan P. Dowling, SPIE Photonics West: Quantum Electronics Metrology, 25–30 January 2009, San Jose, California (invited).
95. "Quantum Technologies — The Second Quantum Revolution," Jonathan P. Dowling, US Army Emerging Technologies Seminar, 6–9 October 2008, McLean, Virginia (invited).
96. "Quantum Technologies — The Second Quantum Revolution," Jonathan P. Dowling, US Army Future Technology Seminar, 19–21 August 2008, Portsmouth, Virginia (invited).
97. "Linear Optical Quantum Computing, Imaging, and Sensing," Jonathan P. Dowling, Asia Pacific Conference on Quantum Information Science, 2–5 July 2008, Cairns, Australia (invited).
98. "What's New with N00N States?" Jonathan P. Dowling, SPIE Photonics West: Quantum Electronics Metrology, 19–24 January 2008, San Jose, California (invited).
99. "Quantum Sensors: The Lowdown on High-N00N", Jonathan P. Dowling, 38th Winter Colloquium on The Physics of Quantum Electronics, 6–10 January 2008, Snowbird, Utah (plenary).
100. "Designer Optical Nonlinearities at the Few-Photon Level: Putting Projective Measurements To Work," Jonathan P. Dowling, Frontiers of Nonlinear Optics, 3–9 July 2007, Nizhny Novgorod, Russia (invited).
101. "Optical Quantum Imaging, Computing, and Metrology: What's New With N00N States?" Jonathan P. Dowling, APS Division of Atomic, Optical, and Molecular Physics Annual Meeting, 5–9 June 2007, Calgary, Canada (invited).
102. "Quantum Sensors," Jonathan P. Dowling, SPIE Fluctuations and Noise, 20–24 May 2007, Florence, Italy (invited).
103. "Photonic Crystals for Thermal Emission Control," Marian Florescu and Jonathan P. Dowling, LSU-NSF Workshop on Quantum Materials and High-Performance Computing, 16–17 April 2007, Arlington, Virginia
104. "Optical Quantum Computing," Jonathan P. Dowling, Winter Colloquium on The Physics of Quantum Electronics, 2–6 January 2007, Snowbird, UT (invited).

105. "Linear optical quantum computing, imaging, and metrology," Jonathan P. Dowling, International Conference on Quantum Communication, Measurement, and Computing, 28 November – 3 December, Tokyo, Japan.
106. "Quantum Imaging and Precision Measurements with N00N States," Jonathan P. Dowling, Optical Society of America Annual Meeting, 8–12 October 2006, Rochester, NY (invited).
107. "Linear Optical Quantum Computing, Imaging, and Metrology," Jonathan P. Dowling, LPHYS-06, 24–28 July 2006, Lausanne, Switzerland (invited).
108. High-fidelity linear optical quantum computing with polarization encoding, Federico Spedalieri, Hwang Lee, and Jonathan P. Dowling, 2006 American Physical Society March Meeting, 13–17 March 2006; Baltimore, MD.
109. Single Photon Source Using Chiral Nematic Liquid Crystal, Ganesh Selvraj, Anand Jha, Pavel Lougovski, Robert Boyd, Jonathan Dowling, 2006 American Physical Society March Meeting, 13–17 March 2006; Baltimore, MD.
110. How to construct a Universal Linear Optical State Generator? Pavel Lougovski, Hwang Lee, Jonathan Dowling, 2006 American Physical Society March Meeting, 13–17 March 2006; Baltimore, MD.
111. The Vortex Phase Qubit, Kishore Kapale and Jonathan Dowling, 2006 American Physical Society March Meeting, 13–17 March 2006; Baltimore, MD.
112. "Linear Optical Quantum Information Processing, Metrology, and Imaging," Jonathan Dowling, Southwest Quantum Information and Technology Annual Workshop, February 17–19, 2006, Albuquerque, New Mexico.
113. Linear Optical Quantum Computing, Imaging, and Metrology, Jonathan Dowling, International Conference On Quantum Optics, 16 – 20 December 2005, Hong Kong, China (invited).
114. Linear Optical Quantum Computing, Imaging, and Metrology, Jonathan Dowling, Wilhelm und Else Heraeus-Seminar: The Photon: Generation, Detection, and Application, 6–9 November 2005, Köln, Germany (invited).
115. Towards a Universal Optical N00N State Generating Machine, Pavel Lougovski, Federico Spedalieri, Hwang Lee, Jonathan P. Dowling, Optical Society of America Annual Meeting, 16–20 October 2005, Tucson, AZ.
116. Optically Controlled Delays for Broadband Pulses, M. Suhail Zubairy, Qingqing Sun, Yuri V. Rostovtsev, Jonathan P. Dowling, Marlan O. Scully; Optical Society of America Annual Meeting, 16–20 October 2005, Tucson, AZ.
117. Heisenberg Limited Interferometry with Neutral Atoms, Kishor T. Kapale, Jonathan P. Dowling, Optical Society of America Annual Meeting, 16–20 October 2005, Tucson, AZ.
118. On the Emission and Absorption of Thermal Radiation in Photonic Crystals, Marian Florescu, Hwang Lee, Jonathan P. Dowling; Optical Society of America Annual Meeting, 16–20 October 2005, Tucson, AZ.
119. Linear Optical Quantum Computing with Polarization Encoding, Federico M. Spedalieri1, Hwang Lee, Jonathan P. Dowling, Optical Society of America Annual Meeting, 16–20 October 2005, Tucson, AZ.
120. Vortex Phase Qubit: Superpositions of Counter-Rotating Phase Structures in BEC through Optical Angular Momentum Beams, Kishor T. Kapale, Jonathan P. Dowling, Optical Society of America Annual Meeting, 16–20 October 2005, Tucson, AZ.
121. Single Photon Quantum Computing, Metrology and Imaging, Pieter Kok, Hwang Lee, Pavel Lougovski, and Jonathan P. Dowling, Single Photon Detector Workshop, 24–26 October 2005, National Physical Laboratory, London, UK (invited).
122. "Mathematical Theory of Thermal Emission Control with Photonic Crystals," Jonathan Dowling, Marian Florescu, Hwang Lee, American Mathematical Society and Society for Industrial and Applied Mathematics to organize a Joint Summer Research Conference on Mathematical Modeling of Novel Optical Materials and Devices, June 12–17 2005 (invited).
123. "Linear Optical Quantum Information Processing, Metrology, and Imaging," Quantum Physics of Nature and European Union Quantum Information Processing and Communication Workshops, Vienna, Austria, 22-26 May 2005.
124. "Linear Optical Quantum Information Processing, Metrology, and Imaging," American Physical Society Annual Meeting, Los Angeles, California, 20-25 March 2005.
125. "Linear Optical Quantum Information Processing, Metrology, and Imaging," Centre for Quantum Computing Annual Workshop, Avoca Beach, Australia, 8-11 February 2005 (invited).

126. "Linear Optical Quantum Information Processing, Metrology, and Imaging," Physics of Quantum Electronics, Snowbird, Utah, 2-16 January 2005 (invited).
127. "Linear Optics for Quantum Information Processing: Error Correction", International Workshop On Quantum Informatics, Hong Kong Baptist University, Kowloon Tong, Hong Kong 16-18 December 2004 (invited).
128. "Schrödinger's Rainbow: The Renaissance in Quantum Optical Interferometry," International Workshop On Quantum Informatics, Hong Kong Baptist University, Kowloon Tong, Hong Kong 16-18 December 2004 (invited).
129. "Linear Optical Quantum Information Processing, Metrology, and Imaging," International Workshop On Quantum Informatics, Hong Kong Baptist University, Kowloon Tong, Hong Kong 16-18 December 2004 (invited).
130. "Linear Optical Quantum Information Processing, Metrology, and Imaging," Tutorial, Optical Society of American Annual Meeting, Rochester, New York, 10-14 October 2004 (invited).
131. "Quantum Lithography: From Quantum Computing towards Quantum Imaging," First International Conference on Imaging at the Limits, IESC, Cargese (Corsica, France) 6-11 September 2004 (invited).
132. "Modeling Linear Optical Quantum Computers," DoD Quantum Computing Program Review, 16-20 August 2004, Orlando, Florida.
133. "Introduction To Linear Optical Quantum Information Processing And Metrology," Quantum Optics and Advanced Spectroscopy Conference of the Great Lakes Photonics Symposium, 8-9 June 2004, Cleveland, Ohio (invited).
134. "All Linear Optical Quantum Memories and Repeaters," APS Division of Atomic, Molecular, and Optical Physics Annual Meeting, Tucson, Arizona, 26-29 May 2004.
135. "Thermal Emissivity Control with Photonic Band-Gap Materials," Conference On Heat Sources and Thermal Management For The Microscale, Chicago, Illinois, 17-19 May 2004 (invited).
136. "All Linear Optical Quantum Memories and Repeaters," Workshop on Advances in Foundations of Quantum Mechanics and Quantum Information with Atoms and Photons, Turin, Italy, 26-28 April 2004 (invited).
137. "Linear Optical Quantum Memories and Repeaters or Effective Photon Nonlinearities by Conditional Linear-Optical Measurements," Southwest Quantum Information Network Workshop, San Diego, California, 20-22 February 2004.
138. "All Linear Optical Quantum Memories and Repeaters," DARPA Focused Quantum Systems (FoQuS) Workshop, Falls Church, Virginia, 28-29 January 2004 (invited).
139. "Long Distance Quantum Communication Using Quantum Error Correction," Winter International Symposium on Information and Communication Technologies, Cancun, Mexico, 5-8 January 2004 (invited).
140. "Linear Optical Quantum Memory," Solid-State Quantum Information Processing Conference, Amsterdam, the Netherlands, 15-18 December 2003.
141. "Linear Optical Quantum Repeaters and Memories: Few Qubits Suffice!" Focus Meeting on Few-Qubit Applications of Quantum Information Processing, Budmerice, Slovakia, 11-14 December 2003 (invited).
142. "Linear Optical Quantum Memory," Quantum Information Sciences and Technologies Program Review, Ft. Lauderdale, Florida, 12-14 November 2003.
143. "Suitability vs. fidelity: Toward better measures of goodness for single-photon guns," Optical Society of America Annual Meeting, Tucson, Arizona, 6-10 October 2003.
144. "Intensity control of high-power dielectric waveguide lasers using photonic band gap evanescent field coupling," Optical Society of America Annual Meeting, Tucson, Arizona, 6-10 October 2003.
145. "Entanglement enhanced two-photon absorption," Optical Society of America Annual Meeting, Tucson, Arizona, 6-10 October 2003.
146. "High quantum efficiency photodetectors for quantum instruments," Optical Society of America Annual Meeting, Tucson, Arizona, 6-10 October 2003.
147. "Linear optical quantum memory," Optical Society of America Annual Meeting, Tucson, Arizona, 6-10 October 2003.
148. "Number-resolving photon and non-photon detectors," Optical Society of America Annual Meeting, Tucson, Arizona, 6-10 October 2003.
149. "Modeling Linear Optical Quantum Computers," DoD Annual Quantum Computing Program Review, Nashville, Tennessee, 18-22 August 2003.

150. "Quantum Technologies: The Second Quantum Revolution," invited keynote lecture, International Workshop on Quantum Dots for Quantum Computing, University of Notre Dame, 7-9 August 2003.
151. "To Scale or Not To Scale: What is the Question?" Theory in Quantum Computing Workshop, Harper's Ferry, Virginia, 9-10 June 2003 (invited).
152. "Quantum Noise Limits to Atom-Interferometric Inertial Sensors," Ultracold Atom Precision Inertial Navigation Systems Workshop, Arlington, Virginia, 27 May 2003 (invited).
153. "Two-Photon Processes in a Faint Biphoton Field," Quantum Electronics and Laser Sciences Conference, Long Beach, California, 19-24 May 2002.
154. "Quantum Technologies-The Second Quantum Revolution," Detectors, Applications, and Methods Single Photon Workshop, Gaithersberg, Maryland, 31 March - 1 April 2003 (invited).
155. "Quantum Limit Sensitivity of Coherent Dark-State Magnetometers," Quantum Electronics and Laser Sciences Conference, Long Beach, California, 19-24 May 2002
156. "Overview of Atomic Ensembles for Quantum Computation," New International Gordon Research Conference On Quantum Information Science, Ventura, California, 23-28 March 2003 (invited).
157. "Thermal Emissivity of 3D Photonic Band-Gap Materials," Quantum Electronics and Laser Sciences Conference, Long Beach, California, 19-24 May 2002
158. "Practical Quantum Repeaters with Linear Optics and Double-Photon Guns," Second Workshop on Quantum Cryptographic Applications, McLean, Virginia, 11-12 February 2003.
159. "From Quantum Computing to Quantum Gyroscopes," Office of Naval Research Program Review, Arlington, Virginia, 29 April-3 May, 2002.
160. "Linear Optics and Projective Measurements for Fun and Profit," Southwest Quantum Information and Technology Network Fifth Annual Meeting, Santa Fe, New Mexico, 6-9 February 2003.
161. "Linear Optics and Projective Measurements for Fun and Profit," Workshop on Decoherence in Quantum Information Processing, Durham, UK, 10-14 April 2002 (invited).
162. "Thermal Emissivity in Photonic Band-Gap Materials," Topical Meeting on Optical Photonic Bandgap Research, San Diego, California, 22-23 January 2003.
163. "Quantum logic gates based on Coulomb blockade devices," Southwest Quantum Information and Technology Network Fourth Annual Meeting, Boulder, Colorado, 8-10 March 2002.
164. "Linear Optics and Projective Measurements for Fun and Profit," U.S.-Australia workshop on Solid State and Optical Approaches to Quantum Information Science, Sydney, Australia, 7-12 January 2003.
165. " Quantum Trajectory Methods for Simulating Solid-State Qubit Systems," International Workshop on Quantum Dots for Quantum Computing, Kochi, Japan, 26-28 January, 2002 (invited).
166. "Quantum Metrology," Complexity in Optics, Leiden, The Netherlands, 29 November 2002.
167. "Two-Photon Processes in Faint Bi-Photon Fields," NASA-DoD Workshop on Quantum Imaging and Metrology, Pasadena, California, 13-15 November 2002.
168. "Quantum Metrology," 32nd Winter Colloquium on The Physics of Quantum Electronics, Snowbird, Utah, 6-10 January, 2002 (invited, plenary lecture).
169. "Quantum Entanglement and Nonlocality in Optical Implementations of Quantum Computation," Optical Society of American Annual Meeting, Long Beach, California, 14-18 October 2001.
170. "Thermal Emissivity of Three-Dimensional Photonic Band-Gap Materials," International Workshop on Photonic and Electromagnetic Crystal Structures, Los Angeles, California, 28-31 October 2002.
171. "Quantum Optical Imaging and Lithography," Optical Society of American Annual Meeting, Long Beach, California, 14-18 October 2001.
172. "Linear Optics and Projective Measurements for Fun and Profit," Models for Quantum Computing, University of California, Los Angeles, 21-23 October 2002.
173. "Thermal Emissivity of 3D photonic band-gap structures," Optical Society of American Annual Meeting, Long Beach, California, 14-18 October 2001.
174. "Noise Rejection Using Classical Short-Pulse Sources and Two-Photon Sensitive Detection," Optical Society of America Annual Meeting, Orlando, Florida, 30 August - 4 September 2002.
175. "Network Applications for Quantum Bit," Optical Society of American Annual Meeting, Long Beach, California, 14-18 October 2001.
176. "Single-Photon QND Devices and Quantum Repeaters with Linear Optics and Projective Measurements," Optical Society of America Annual Meeting, Orlando, Florida, 30 August - 4 September 2002.
177. "Cold Atom Techniques Applied to Ultra-Sensitive Magnetometers," Optical Society of American Annual Meeting, Long Beach, California, 14-18 October 2001.

178. "Generation of Desired Quantum Correlations for Quantum Lithography and Heisenberg-Limited Interferometry," Optical Society of America Annual Meeting, Orlando, Florida, 30 August - 4 September 2002.
179. "Quantum Clock Synchronization," DoD Quantum Computing Program Review, Baltimore, Maryland, 28-31 August 2001.
180. "Two-Photon Processes in Biphoton Fields," Optical Society of America Annual Meeting, Orlando, Florida, 30 August - 4 September 2002.
181. "Quantum Trajectory Simulations of Radio-Frequency Transistors," DoD Quantum Computing Program Review, Baltimore, Maryland, 28-31 August 2001.
182. "Quantum Optical Metrology," Optical Society of America Annual Meeting, Orlando, Florida, 30 August - 4 September 2002.
183. "Quantum Lithography," The 2001 Workshop on Laser Physics and Quantum Optics, 30 July-3 August, 2001, Jackson Hole, Wyoming (invited).
184. "Quantum Networks," NRO-NSA Workshop on Practical Applications of Quantum Cryptography, McLean, Virginia, 30-31 July 2001 (invited).
185. "Theory and Modeling of Radio-Frequency Single Electron Transistors and Linear Optical Quantum Computers," DoD Quantum Computing Program Review, Nashville, Tennessee, 19-23 August 2002.
186. "Quantum Lithography," International Conference on Quantum Information, 10-13 June 2001 (invited).
187. "Linear Optics and Projective Measurements for Fun and Profit," Sixth International Conference on Quantum Communication, Measurement, and Computing, 22-26 July 2002, Boston, MA.
188. "Initiatives in Quantum Metrology," Eighth Rochester Conference on Coherence and Quantum Optics, 13-16 June 2001 (invited).
189. "Two-Photon Processes in Biphoton Fields," Quantum Electronics and Laser Sciences Conference, Long Beach, California, 19-24 May 2002.
190. "Quantum Lithography," Seventh International Conference on Squeezed States and Uncertainty Relations, Boston, Massachusetts, 4-8 June 2001 (invited).
191. "Thermal Emissivity of 3D Photonic Band-Gap Materials," Quantum Electronics and Laser Sciences Conference, Long Beach, California, 19-24 May 2002.
192. "Experimental Single-Cooper-Pair-Based Quantum Computing at JPL," Southwest Quantum Information and Technology (SQuInT) Network Annual Meeting, California Institute of Technology, Pasadena, California, 2-4 March 2001 (invited).
193. "Quantum Limit Sensitivity Of Coherent Dark-State Magnetometers," Quantum Electronics and Laser Sciences Conference, Long Beach, California, 19-24 May 2002.
194. "Quantum Clock Synchronization Based on Shared Prior Entanglement," Quantum Information Theory Workshop, Gold Coast, Australia, 21-25 January 2001.
195. "From Quantum Computing to Quantum Gyroscopes," Office of Naval Research Program Review, Arlington, Virginia, 29 April-3 May, 2002.
196. "Universal Quantum Gates for Single Cooper Pair Box Based Quantum Computing," International Conference on the Experimental Implementation of Quantum Computing, Sydney, Australia, 16-19 January 2001.
197. "Quantum Key Distribution for SATCOM at JPL," DoD Quantum Information Science Meeting, MITRE Corp., Reston, Virginia, 18 December 2000.
198. "Quantum Interferometric Optical Lithography," Optical Society of America Annual Meeting, Providencetown, Rhode Island, 22-26 October 2000.
199. "Quantum Clock Synchronization Based on Shared Prior Entanglement," Optical Society of America Annual Meeting, Providencetown, Rhode Island, 22-26 October 2000.
200. "Secure Communications on the Quantum-Electronic Battlefield," DARPA Quantum Information Science and Technology Workshop, Greenbelt, Maryland, 23-24 October 2000.
201. "Quantum Atomic Clock Synchronization," ARDA Quantum Computing Symposium, 28 August 2000.
202. "Implementing an Arbitrary One-Qubit Gate with the Single Cooper Pair Box Approach: Specific Calculations," Progress in Electromagnetics Research Symposium, Boston, Massachusetts, 5-14 July 2000.
203. "Quantum Interferometric Optical Lithography," Fifth International Conference on Quantum Communication Measurement & Computing, Capri, Italy, 3-8 July 2000.

204. "Quantum Atomic Clock Synchronization," DoD Quantum Communication and Quantum Memory Initiative, Ft. Monmouth, New Jersey, 13-14 June 2000.
205. "Quantum Interferometric Lithography," Southwest Quantum Information and Technology Network Annual Meeting, Albuquerque, New Mexico, 19-21 May 2000.
206. "Quantum Interferometric Lithography," Quantum Electronics and Laser Sciences Conference, San Francisco, California, 7-12 May 2000.
207. "Modification of Planck Blackbody Radiation by Photonic Band Gap Structures," Quantum Electronics and Laser Sciences Conference, San Francisco, California, 7-12 May 2000.
208. "Quantum Lithography," Workshop on Quantum Electronics, Snowbird, Utah, 10-12 January 2000.
209. "Maxwell duality, Lorentz invariance, and topological phase," Optical Society of America Annual Meeting, Santa Clara, California, 26-30 September 1999.
210. "Two-slit Diffraction, Entanglement, and Nonlocality," J. P. Dowling & C. P. Williams, Southwest Quantum Information Network Annual Meeting, Albuquerque, New Mexico, 30 April - 2 May 1999.
211. "Quantum Interferometry," Workshop on Fundamental Problems in Quantum Mechanics, Baltimore, Maryland, 9-13 August 1999.
212. "Maxwell Duality, Lorentz Invariance, and Topological Phase," Workshop on Quantum Optics, Jackson Hole, Wyoming, 26-30 July 1999.
213. "From Quantum Computing to Quantum Gyroscopes," J. P. Dowling, Nuclear Magnetic Resonance and Quantum Computation, 22-24 February 1999, Cambridge, Massachusetts.
214. "Quantum Interferometry," J. P. Dowling Sixth International Conference on Squeezed States and Uncertainty Relations, Naples, Italy, 24-29 May 1999.
215. "Quantum Algorithms," J. P. Dowling, paper XS4, Conference on Enabling Technologies for Petaflops Computing, 15-19 February 1999, Santa Barbara, California.
216. "From Quantum Computing to Quantum Gyroscopes," J. P. Dowling, Algorithms in Quantum Information Processing, 18-22 January 1999, Chicago, Illinois.
217. "Modifications to Blackbody Radiation in Photonic Band-Gap Structures," C. M. Cornelius & J. P. Dowling, Workshop on Electromagnetic Crystal Structures, Design, Synthesis, and Applications, 6-8 January 1999, Laguna Beach, California.
218. "Parity, Time Reversal, and Group Delay: Pulse Propagation in One-Dimensional Photonic Band-Gap Structures," J. P. Dowling, paper ThJJ4, Optical Society of America Annual Meeting, 4-9 October 1998, Baltimore, Maryland.
219. "Modifications to Blackbody Radiation in Photonic Band-Gap Structures," C. M. Cornelius & J. P. Dowling, paper MG6, Optical Society of America Annual Meeting, 4-9 October 1998, Baltimore, Maryland.
220. "Correlated Input-Port, Matter-Wave Interferometer: Quantum Noise Limits to the Atom Laser Gyroscope, J. P. Dowling, International Conference on Atomic Physics, 3-7 August, 1998, Windsor, Ontario.
221. "One-Dimensional, Thin-Film, Photonic Band-Gap Materials for IR Emissivity Control, J. P. Dowling, M. J. Bloemer, M. D. Tocci, M. Scalora, C. M. Bowden, paper A-P6, Army Science Conference, 15-17 June 1998, Norfolk, Virginia.
222. "Correlated Input-Port, Matter-Wave Interferometer: Quantum-Noise Limits to the Atom Laser Gyroscope," J. P. Dowling, paper BO-2, Army Science Conference, 15-17 June 1998, Norfolk, Virginia. (Paper won "best in session" award.)
223. "Modifications to Blackbody Radiation in a One-Dimensional Photonic Bandgap Structure," J. P. Dowling, M. J. Bloemer, M. D. Tocci, M. Scalora, C. M. Bowden, paper QTuJ3, International Quantum Electronics Conference, 3-8 May 1998, San Francisco, California.
224. "From Quantum Computers to Quantum Gyroscopes," J. P. Dowling, NASA International Conference on Quantum Computing & Quantum Communications, 17-20 February 1998, Palm Springs, California.
225. "Quantum Noise Limits to the Atom Laser Gyroscope," J. P. Dowling, Winter Colloquium on Quantum Electronics, 13-16 January 1997, Snowbird, Utah (invited).
226. "One-Dimensional, Thin-Film, Photonic Band-Gap Materials for Infrared Emissivity Control," J. P. Dowling, M J. Bloemer, M Scalora, C M. Bowden, Meeting of the IRIS Specialty Group on Camouflage, Concealment, and Deception, 28-30 October, 1997, Monterey, California.
227. "Quantum Noise Limits to the Atom Laser Gyroscope," J. P. Dowling, Taos Summer School on Quantum Optics, 15-17 August, 1997, Taos, New Mexico.

228. "Quantum Noise Limits to the Atom Laser Gyroscope," J. P. Dowling, European Research Conference on Bose-Einstein Condensation, 12-17 July 1997, Castelvecchio Pascoli, Italy.
229. "Analytic Expressions for Spontaneous Emission Rates in Finite, One-Dimensional, Photonic Band-Gap Structures," J. P. Dowling, I. Fogel, M. Scalora, Paper ThMM4, Optical Society of America Annual Meeting, 12-17 October 1997, Long Beach, California.
230. "Quantum Noise Limits to the Atom-Laser Gyro," J. P. Dowling, Paper TuLL6, Optical Society of America Annual Meeting, 12-17 October 1997, Long Beach, California.
231. "Spontaneous Emission and Nonlinear Effects in Photonic Band-Gap Materials," I. S. Fogel, J. M. Bendickson, M. D. Tocci, M J. Bloemer, M Scalora, C M. Bowden, and J P. Dowling, 11th European Optical Society Meeting on Materials for Nonlinear Optics, 8-12 July 1997, Capri, Italy (invited).
232. "Quantum Computing Using Laser Pulse Induced Electronic Excitation Control of Electron-Nuclear Double Resonances," C. M. Bowden, J. P. Dowling, S. D. Pethel, and Steven P. Hotaling, Paper MLL4, Optical Society of America Annual Meeting, 12-17 October 1997, Long Beach, California.
233. "ENDOR Process: an Approach to Quantum Computation," C. M. Bowden, J. P. Dowling, T. Cole and S. P. Hotaling, SPIE AeroSense 1997 meeting: Conference on Photonic Quantum Computing, Orlando, Florida, 20-25 April 1997 (invited).
234. "Hollow-Fiber, Evanescent Light-Wave, Atom-Bottle Trap," J. P. Dowling, Paper QWD15, Technical Digest, Vol. 12, Quantum Electronics and Laser Science Conference, 18-23 May 1997, Baltimore, Maryland.
235. "Exact Analytic Expressions for Spontaneous Emission in Finite, One-Dimensional, Photonic Band-Gap Structures," J. P. Dowling, I. Skinner, and M. Scalora, Winter Colloquium on Quantum Electronics, 13-16 January 1997, Snowbird, Utah (invited).
236. "Analytic Expressions for the Electromagnetic Mode Density in Finite, One-Dimensional, Photonic Band-Gap Structures," J. P. Dowling, J. M. Bendickson, M. Scalora, Paper ThXX8, Optical Society of America Annual Meeting, 20-24 October 1996, Rochester, New York.
237. "Ultrashort Pulse Propagation at the Photonic Band Edge: Large Tunable Delay and Minimal Scattering Losses," M. Scalora, J. P. Dowling, M. D. Tocci, M. J. Bloemer, C. M. Bowden, J. M. Bendickson, H. S. Ledbetter, R. J. Flynn, and S. B. Reinhardt, Paper MS4, Optical Society of America Annual Meeting, 20-24 October, 1996, Rochester, New York.
238. "Hollow-Fiber, Evanescent Light-Wave, Atom-Bottle Trap," J. P. Dowling, Paper MGG2, Optical Society of America Annual Meeting, 20-24 October 1996, Rochester, New York.
239. "Photonic Band-Edge Effects," J. P. Dowling, M. Scalora, M. D. Tocci, M. J. Bloemer, C. M. Bowden, European Research Conference on Quantum Optics, 21-26 September, 1996, Castelvecchio Pascoli, Italy.
240. "The Classical Lamb Shift," J. P. Dowling, Workshop In Celebration of the 50th Anniversary of the Discovery of the Lamb Shift, 18-22 August 1996, Bellingham, Washington (invited).
241. "Microwave and Millimeter Wave Applications of Photonic Band-Gap Materials," J. P. Dowling, M. Scalora, M. J. Bloemer, M. D. Tocci, and C. M. Bowden, 20th Army Science Conference, Science and Technology for Force XXI, 25-27 June 1996, Norfolk, Virginia.
242. "Photonic Band-Gap Materials," J. P. Dowling, M. J. Bloemer, M. D. Tocci, and M. Scalora, and C. M. Bowden, AMCOM / Alabama A&M Joint Workshop on Nonlinear Optics, 1-2 May 1996, Normal, Alabama (invited).
243. "Solutions of Maxwell's Wave Equations for 3D, 2D, and 1D Periodic Dielectric Structures and Applications to Photonic Band-Gap Materials, "C. M. Bowden, J. P. Dowling, M. Scalora, A. S. Manka, M. J. Bloemer, and M. Tocci, VI International Conference on Nonlinear Hyperbolic Problems, 15-19 June 1996, Hong Kong.
244. "Factoring Integers with Young's N Slit Interferometer: Classical-Analog Versus Quantum Digital Computers," J. F. Clauser and J. P. Dowling, Technical Digest, Vol. 17, Quantum Electronics and Laser Science Conference, 2-7 June 1996, Anaheim, California.
245. "Ultrashort Pulse Propagation in One-Dimensional Photonic Band-Gap Structures: Low Momentum States and Shape Invariance," M. Scalora, R. L. Fork, M. J. Bloemer, M. D. Tocci, C. M. Bowden, J. M. Bendickson, and J. P. Dowling, Technical Digest, Vol. 17, Quantum Electronics and Laser Science Conference, 2-7 June 1996, Anaheim, California.
246. "Analytic Expressions for the Electromagnetic Mode Density in Finite, One-Dimensional, Photonic Band-Gap Structures," J. M. Bendickson, J. P. Dowling and M. Scalora, Paper QThF, Technical Di-

gest, Vol. 17, Quantum Electronics and Laser Science Conference, 2-7 June 1996, Anaheim, California.

247. "Ultrashort pulse propagation at the photonic band edge: large tunable group delay with minimal distortion and loss," R. L. Fork, M. Scalora, R. Flynn, S. Reinhart, J. P. Dowling, M. J. Bloemer, M. D. Tocci, C. M. Bowden, and R. P. Leavitt, American Physical Society Annual Meeting, 18-22 March 1996, St. Louis, Missouri.
248. "Effect of the Photonic Band Edge on Spontaneous Emission from Multilayer Semiconductor Devices," M. J. Bloemer, M. D. Tocci, J. P. Dowling, C. M. Bowden, and M. Scalora, ARO-Sponsored Canada-US Workshop on Frontiers of Quantum Electronics, 29 February-1 March, 1996, Toronto, Canada (invited).
249. "Ultrashort Pulse Propagation at the Photonic Band Edge: Large Tunable Group Delay with Minimal Distortion and Loss," M. Scalora, R. L. Fork, M. D. Tocci, M. J. Bloemer, C. M. Bowden, H. S. Ledbetter, J. M. Bendickson, J. P. Dowling, and R. P. Leavitt, 26th Winter Colloquium on Quantum Electronics, 6-11 January 1996, Snowbird, Utah (invited).
250. "Optically Generated Photonic Band Gaps," A. S. Manka, M. Scalora, J. P. Dowling, C. M. Bowden, and G. Kurizki, 26th Winter Colloquium on Quantum Electronics, 6-11 January 1996, Snowbird, Utah (invited).
251. "Local Field Effects in Induced Quantum Coherence," C. M. Bowden, A. S. Manka, J. P. Dowling, M. Fleischhauer, H. Rabitz, and N. Wang, LASERS '95, 4-8 December 1995, Charleston, South Carolina (invited).
252. "Impulses, Traveling and Standing Waves in Synchronous Sonoluminescence," F. B. Seeley and J. P. Dowling, Acoustical Society of America Annual Meeting, 27 November-1 December 1995 St. Louis, Missouri.
253. "Local field effects in stimulated Raman scattering," M. Scalora, A. S. Manka, J. P. Dowling, and C. M. Bowden, Paper FF7, Optical Society of America Annual Meeting, 10-15 September 1995, Portland, Oregon.
254. "Factorization of integers with Young's N-slit interferometer," J. F. Clauser and J. P. Dowling, Paper FC1, Optical Society of America Annual Meeting, 10-15 September 1995, Portland, Oregon.
255. "Spontaneous emission alteration at the photonic band edge of multi-layer semiconductor structures," M. D. Tocci, M. J. Bloemer, M. Scalora, J. P. Dowling, and C. M. Bowden, Paper ThII5, Optical Society of America Annual Meeting, 10-15 September 1995, Portland, Oregon.
256. "Pulsed second-harmonic generation in photonic band-gap structures," M. Scalora, J. P. Dowling, M. J. Bloemer, M. Tocci, C. M. Bowden and J. W. Haus, Paper ThII3, Optical Society of America Annual Meeting, 10-15 September 1995, Portland, Oregon.
257. "Optically generated photonic band gaps," A. S. Manka, M. Scalora, J. P. Dowling, G. Kurizki, and C. M. Bowden, Paper ThII4, Optical Society of America Annual Meeting, 10-15 September 1995, Portland, Oregon.
258. "Nonlinear 1-D photonic band gap device with unidirectional transmittance," M. Bloemer, M. D. Tocci, M. Scalora, J. P. Dowling and C. M. Bowden, Paper ThII2, Optical Society of America Annual Meeting, 10-15 September 1995, Portland, Oregon.
259. "Effective index of refraction theory for photonic band gap materials," J. P. Dowling and M. Scalora, Paper ThII1, Optical Society of America Annual Meeting, 10-15 September 1995, Portland, Oregon.
260. "Practical realization of the Wilkens-Röntgen topological phase in an atomic system," J. P. Dowling, Paper WVV26, Optical Society of America Annual Meeting, 10-15 September 1995, Portland, Oregon.
261. "Enhancement of c3 in piezophotonic switching," A. S. Manka, M. Fleischhauer, M. Scalora, J. P. Dowling, and C. M. Bowden, Paper TuV4, Optical Society of America Annual Meeting, 10-15 September 1995, Portland, Oregon.
262. "Spontaneous emission rates and nonlinear effects in photonic band-gap materials," (Invited Talk) NATO Advanced Research Workshop: Quantum Optics in Wavelength-Scale Structures, 26 August - 2 September 1995, Cargese, Corsica (France).
263. "Photonic Bandgap Edge Effects," J. P. Dowling, M. J. Bloemer, C. M. Bowden, M. Scalora, and M. D. Tocci, Seventh Rochester Conference on Coherence and Quantum Optics, 7-10 June 1995, Rochester, New York.

264. "Thermodynamic Dicke Phase Transitions in Atom Traps," C. M. Bowden and J. P. Dowling, Paper QWF3, Technical Digest, Vol. 16, Quantum Electronics and Laser Science Conference, 22-26 May 1995, Baltimore, Maryland.
265. "Alteration of Spontaneous Emission Rate in GaAs/AlGaAs/AlAs Multilayer Structures," M. D. Tocci, M. J. Bloemer, M. Scalora, J. P. Dowling and C. M. Bowden, Paper QThE3, Technical Digest, Vol. 16, Quantum Electronics and Laser Science Conference, 22-26 May 1995, Baltimore, Maryland.
266. "Pulse Propagation Near Highly Reflective Surfaces: Applications to Photonic Bandgap Structures," M. Scalora, J. P. Dowling, A. S. Manka, and C. M. Bowden, Paper QWH3, Technical Digest, Vol. 16, Quantum Electronics and Laser Science Conference, 22-26 May 1995, Baltimore, Maryland.
267. "Modifications to the Planck blackbody radiation Formula in a Microcavity: Thermal Corrections to the Cavity-Induced Lamb Shift," J. P. Dowling and A. O. Barut, Paper QTuG19, Technical Digest, Vol. 16, Quantum Electronics and Laser Science Conference, 22-26 May 1995, Baltimore, Maryland.
268. "Modifications to the Planck Blackbody Radiation Formula in a Microcavity," J. P. Dowling, 25th Winter Colloquium on Quantum Electronics, 3-6 January 1995, Snowbird, Utah (invited).
269. "Local Field Effects in Nonlinear and Quantum Optics: Recent Developments," J. P. Dowling, and C. M. Bowden, LASERS '94, 12-16 December 1994, Quebec City, Canada (invited).
270. "Pulse Propagation in a Medium of Four-Level Atoms," A. S. Manka, M. Scalora, J. P. Dowling, and C. M. Bowden, Optical Society of America Annual Meeting, 2-7 October 1994, Dallas, Texas.
271. "Electromagnetic Pulse Propagation Near Highly-Reflective Surfaces," M. Scalora, J. P. Dowling, A. S. Manka, and J. W. Haus, Optical Society of America Annual Meeting, 2-7 October 1994, Dallas, Texas.
272. "Nonlinear Optical Diode in GaAs/AlGaAs Multilayer Structures," M. Tocci, M. J. Bloemer, M. Scalora, J. P. Dowling and C. M. Bowden, Optical Society of America Annual Meeting, 2-7 October 1994, Dallas, Texas.
273. "Optical Limiting and Switching in Nonlinear Photonic Bandgap Materials," M. Scalora, J. P. Dowling, C. M. Bowden, and M. J. Bloemer, Optical Society of America Annual Meeting, 2-7 October 1994, Dallas, Texas.
274. "The Analog of Paramagnetic Phase Transitions in Atom Traps," J. P. Dowling and C. M. Bowden, Optical Society of America Annual Meeting, 2-7 October 1994, Dallas, Texas.
275. "Modifications to the Planck Blackbody Radiation Formula in a Microcavity," J. P. Dowling and A. O. Barut, Optical Society of America Annual Meeting, 2-7 October 1994, Dallas, Texas.
276. "Spontaneous Emission In Cavities: How Much More Classical Can You Get?" J. P. Dowling, NATO Advance Study Institute on Electron Theory and Quantum Electrodynamics, 5-16 September 1994, Edirne, Turkey (invited).
277. "Quantum Atomic Dots," J. P. Dowling and J. Gea-Banacloche, Third Crested Butte Workshop on Quantum Coherence and Interference, 8-11 August 1994, Crested Butte, Colorado (invited).
278. "Local Field Effects in Quantum Optics: A Historical Perspective," J. P. Dowling and C. M. Bowden, Third Crested Butte Workshop on Quantum Coherence and Interference, 8-11 August 1994, Crested Butte, Colorado (invited).
279. "Propagation Effects in Lasing Without Inversion," A. S. Manka, J. P. Dowling, and C. M. Bowden, Third Crested Butte Workshop on Quantum Coherence and Interference, 8-11 August 1994, Crested Butte, Colorado (invited).
280. "Local Field Effects in Lasing Without Inversion," C. M. Bowden, J. P. Dowling, and A. Manka, Third Crested Butte Workshop on Quantum Coherence and Interference, 8-11 August 1994, Crested Butte, Colorado (invited).
281. "Quantum Atomic Dots," J. P. Dowling and J. Gea-Banacloche, XIV International Conference on Atomic Physics, 31 July-5 August 1994, Boulder, Colorado.
282. "Photonic Band Edge Optical Diode," M. Scalora, J. P. Dowling and C. M. Bowden, XXI International Quantum Electronics Conference, 8-13 May 1994, Anaheim, California.
283. "Atomic Quantum Dots," J. P. Dowling and J. Gea-Banacloche, XXI International Quantum Electronics Conference, 8-13 May 1994, Anaheim, California.
284. "Compton Scattering Near Mirrors: Applications To Improved Free-Electron Lasers," J. P. Dowling, XXI International Quantum Electronics Conference, 8-13 May 1994, Anaheim, California.
285. "Local-Field Effects In A Coherently Prepared Medium Of Three-Level Atoms," A. S. Manka, J. P. Dowling, C. M. Bowden, M. Fleischhauer, XXI International Quantum Electronics Conference, 8-13 May 1994, Anaheim, California.

286. "Quantum Atomic Dots," J. P. Dowling, and J. Gea-Banacloche, U. S. Army Aviation & Missile Command-University of Rochester Army Research Office University Research Initiative (ARO-URI) Workshop, 22-25 March 1994, Huntsville, Alabama (invited).
287. "Anomalous Index of Refraction In Photonic Bandgap Materials," J. P. Dowling, and C. M. Bowden, U. S. Army Aviation & Missile Command-University of Rochester Army Research Office University Research Initiative (ARO-URI) Workshop, 22-25 March 1994, Huntsville, Alabama (invited).
288. "The Photonic Band Edge Laser: A New Approach to Gain Enhancement," J. P. Dowling, M. Scalora, M. J. Bloemer, and C. M. Bowden, U. S. Army Aviation & Missile Command-University of Rochester Army Research Office University Research Initiative (ARO-URI) Workshop, 22-25 March 1994, Huntsville, Alabama (invited).
289. "Piezophotonic Switching from Local Field Effects in Lasing Without Inversion," A. S. Manka, J. P. Dowling, and C. M. Bowden, 24th Winter Colloquium on Quantum Electronics, 4-8 January 1994, Snowbird, Utah (invited).
290. "Photonic Bandgap Edge Effects," J. P. Dowling, M. Scalora, M. J. Bloemer, and C. M. Bowden, 24th Winter Colloquium on Quantum Electronics, 4-8 January 1994, Snowbird, Utah (invited).
291. "Quantum Atomic Dots: A New Approach To Gravimetry," J. P. Dowling and J. Gea-Banacloche, Optical Society of America Annual Meeting, 3-8 October 1993, Toronto, Canada.
292. "Quantum Noise Limits To Matter-Wave Interferometry," J. P. Dowling and M. O. Scully, Optical Society of America Annual Meeting, 3-8 October 1993, Toronto, Canada.
293. "Local Field Effects In Lasing Without Inversion: An Enhancement Of Gain And Absorptionless Index Of Refraction," A. Manka, J. P. Dowling and C. M. Bowden, Optical Society of America Annual Meeting, 3-8 October 1993, Toronto, Canada.
294. "Anomalous Index Of Refraction In Photonic Bandgap Materials," J. P. Dowling and C. M. Bowden, Ninth Interdisciplinary Laser Science Conference, 3-8 October 1993, Toronto, Canada.
295. "Enhancement Of Gain In A Vertical Cavity Laser: The Photonic Bandgap Approach," J. P. Dowling, M. Scalora, M. J. Bloemer, and C. M. Bowden, Ninth Interdisciplinary Laser Science Conference, 3-8 October 1993, Toronto, Canada.
296. "Quantum Noise Limits To Matter-Wave Interferometry," J. P. Dowling and M. O. Scully, Third International Workshop on Squeezed States and Uncertainty Relations, 10-13 August 1993, University of Maryland Baltimore County, Baltimore, Maryland (invited).
297. "Local Field Enhancement of Lasing Without Inversion II: The Power Broadened Limit," J. P. Dowling, C. M. Bowden, and A. Manka, Second Crested Butte Workshop on Atomic Coherence and Interference, 26-30 July 1993, Crested Butte, Colorado (invited).
298. "Local Field Enhancement of Lasing Without Inversion I: The Low Field Limit," C. M. Bowden, J. P. Dowling, and A. Manka, Second Crested Butte Workshop on Atomic Coherence and Interference, 26-30 July 1993, Crested Butte, Colorado (invited).
299. "Something For Nothing? You Bet! Local Field Enhancement Of Lasing Without Inversion," J. P. Dowling, SymposiUlm on Quantum Optics, 19-21 July 1993, Ulm, Germany (invited).
300. "Atomic Emission Rates in Photonic Bandgap Materials", U. S. Army Aviation & Missile Command-University of Rochester Army Research Office-University Research Initiative (ARO-URI) Workshop, Center for Applied Optics, Huntsville, Alabama, 10-11 June 1993 (invited).
301. "Compton Scattering Near Mirrors: Improving Free Electron Laser Gain Through Cavity Quantum Electrodynamical Effects?" J. P. Dowling, Workshop on New Theoretical Methods in Quantum Optics, 30 June - 2 July, 1993, Boulder, Colorado (invited).
302. "Local Field Enhancement of Lasing Without Inversion," J. P. Dowling and C. M. Bowden, Quantum Electronics and Laser Science Conference, 2-7 May 1993, Baltimore, Maryland.
303. "Beat Radiation from Dipoles Near a Photonic Band Edge," J. P. Dowling and C. M. Bowden, Quantum Electronics and Laser Science Conference, 2-7 May 1993, Baltimore, Maryland.
304. "Wigner Distribution for Dicke, Coherent, and Squeezed Atomic States," J. P. Dowling, G. S. Agarwal, and W. P. Schleich, Quantum Electronics and Laser Science Conference, 2-7 May 1993, Baltimore, Maryland.
305. "Atomic Emission Rates in Photonic Bandgap Materials", U. S. Army Aviation & Missile Command / University of Rochester, Army Research Office - University Research Initiative (ARO - URI) Workshop, Center for Applied Optics, Huntsville, Alabama, 19 March 1993 (invited).

306. "Photonic Bandgap Materials", U. S. Army Aviation & Missile Command / Center for Molecular and Atomic Studies at Surfaces (CMASS) Workshop, Vanderbilt University, Department of Physics and Astronomy, 19 February 1993 (invited).
307. "Quantum Limits to Matter Wave Interferometry," M. O. Scully and J. P. Dowling, 23rd Winter Colloquium on Quantum Electronics, 5-9 January 1993, Snowbird, Utah (invited).
308. "Atomic Emission Rates in Photonic Band Structures," J. P. Dowling and C. M. Bowden, Optical Society of America Annual Meeting, 20-25 September 1992, Albuquerque, New Mexico.
309. "Near Dipole-Dipole Effects in a Dense Media of Two-Level Atoms," J. P. Dowling and C. M. Bowden, Optical Society of America Annual Meeting, 20-25 September 1992, Albuquerque, New Mexico.
310. "Local Field Corrections to Lasing Without Inversion," C. M. Bowden and J. P. Dowling, Workshop On Atomic Coherence and Interference in Quantum Optics, 14-18 September 1992, Crested Butte, Colorado (invited).
311. "Quantum Limits to Matter Wave Interferometry," M. O. Scully and J. P. Dowling, Workshop On Atomic Coherence and Interference in Quantum Optics, 14-18 September 1992, Crested Butte, Colorado (invited).
312. "Beat Radiation from Dipoles Near a Photonic Band Edge," J. P. Dowling and C. M. Bowden, International Research Workshop of Quantum Optics, Weizmann Institute of Science, 22-26 June 1992, Rehovot, Israel (invited).
313. "Atomic Radiation Rates in Photonic Band Structures," J. P. Dowling and C. M. Bowden, XVIII International Quantum Electronics Conference, 14-19 June 1992, Vienna, Austria.
314. "Rutherford Scattering Near Mirrors: The Kapitza-Dirac Effect with Virtual Photons," J. P. Dowling, Workshop on Optics and Interferometry with Atoms, 8-12 June 1992, Konstanz, Germany (invited).
315. "Wigner Functions for Nonclassical States of a Collection of Two-Level Atoms," G. S. Agarwal, J. P. Dowling, and W. P. Schleich, Second International Workshop on Squeezed States and Uncertainty Relations, 25-30 May 1992, Moscow, Russia (invited).
316. "A Simple Scalar Model of Atomic Radiation Rates in Photonic Band Structures," J. P. Dowling and C. M. Bowden, Quantum Electronics and Laser Science Conference, 10-15 May 1992, Anaheim, California.
317. "Atomic Emission Rates in Inhomogeneous Media with Applications to Photonic Band Structures," J. P. Dowling and C. M. Bowden, Workshop on the Development and Applications of Photonic Band Structures, 28-30 January 1992, Park City, Utah (invited).
318. "Classical versus Quantum Effects in Cavity QED," J. P. Dowling, Santa Fe Meeting on the Foundation of Quantum Mechanics, 27-31 May 1991, Santa Fe, New Mexico (invited).
319. "Classical Dipole Radiation in Cavities," J. P. Dowling and M. O. Scully, Quantum Electronics and Laser Science Conference, 12-17 May 1991, Baltimore, Maryland.
320. "A Gaussian Measure of Quantum Phase Noise," W. P. Schleich, J. P. Dowling, and R. J. Horowicz, Workshop on Squeezed States and Uncertainty Relations, 28-30 March 1991, College Park, Maryland (invited).
321. "Cavity QED and Classical Antenna Theory," J. P. Dowling, M. O. Scully, and F. DeMartini, NATO Advance Research Workshop on Quantum Measurements in Optics, 21-25 January 1991, Cortina D'Ampezzo, Italy (invited).
322. "Quantum States of Minimum Phase Uncertainty," W. P. Schleich, J. P. Dowling and R. J. Horowicz, Meeting of the German Physical Society, 14-18 May 1990, Munich, Germany.
323. "QED Based on Self-Fields: Cavity Effects," J. P. Dowling, NATO Advance Study Institute on New Frontiers in Quantum Electrodynamics and Quantum Optics, 14-26 August 1989, Istanbul, Turkey (invited).

Other Presentations (Invited)

1. "Schrödinger's Rainbow," Jonathan P Dowling, OSA Student Chapter Lecture, 13 DEC 2016, Hebrew University of Jerusalem, Israel.
2. Various colloquia and seminars on quantum technologies at the Hebrew University of Jerusalem, The Tel Aviv University, the Ben Gurion University, the Bar-Ilan University, and the Weizmann Institute (6 talks in all), 15–26 June 2015, Israel.
3. "Quantum Optical Sensing Technologies," Halliburton Corporation Seminar, Houston, 2016.
4. "Introduction to Quantum Metrology," Jonathan P. Dowling, EQuS Winter School, 22–25 July 2014, Macquarie University, Sydney, Australia.

5. "Schrödinger's Rainbow: The Renaissance in Quantum Optical Interferometry," Physics Department Colloquium, 01 October 2014 (University of Maryland, Baltimore County, MD).
6. "Quantum Information Technologies," Jonathan P. Dowling, United Nations Counter-Terrorism Committee Executive Directorate Retreat on Information and Communication Technologies and Counter-Terrorism, 17 December 2013, United Nations HQ, NY.
7. "Quantum Technology: The Second Quantum Revolution," Jonathan P. Dowling, Quantum Information and Sensing Army Science Planning and Strategy Meeting, 24-25 September 2013, Potomac, MD.
8. "Distinction Between Entanglement and Coherence in Many Photon States and Impact on Super-Resolution," Jonathan P. Dowling, ONR Program Review, San Diego, CA (2013)
9. "Quantum Technology," 25 August 2013, Colloquium, MacQuarie University, Sydney, Australia.
10. "Schrödinger's Rainbow," 13 December 2012, Colloquium, University of Leeds, UK.
11. "Schrödinger's Rainbow," 11 December 2012, Colloquium, University of Bristol, UK.
12. "Schrödinger's Rainbow," 22 November 2012, Optical Society of America Traveling Lecture Series, ħ-OMEGA OSA student chapter, University of Erlangen, Germany.
13. "Quantum Technology: The Second Quantum Revolution," 17 September 2012, Herb Seminar, Department of Physics, University of Wisconsin, Madison, WI.
14. "Schrödinger's Rainbow," 04 July 2012, Colloquium, Beijing Computational Science Research Center.
15. "Quantum Technology: The Second Quantum Revolution, 23 September 2011, Colloquium, William and Mary College, Williamsburg, VA.
16. "Quantum Sensors, Metrology, and Imaging, 25 January 2011, Seminar, Institute of Physics, Chinese Academy of Science, Beijing.
17. Quantum Technology: The Second Quantum Revolution, 20 October 2010, Colloquium, University of Stony Brook, New York.
18. Quantum Computing, Imaging, and Metrology, 21 October 2010, Seminar, University of Stony Brook, New York.
19. Princeton Center for Theoretical Physics Seminar, "Quantum Sensors," 30 September 2009, Princeton University, Princeton, NJ.
20. ARO-IARPA Quantum Computing Program Review, "Optical Quantum Computing," 17–21 August 2009, Minneapolis, MN.
21. ARO Quantum Imaging MURI Program Review, "Quantum Lithography," 16–18 November 2008, University of Maryland, Baltimore.
22. DARPA Quantum Sensor Program Review, "Quantum Sensor Optimization," 26–29 August, Hilton Head, North Carolina.
23. ARO-IARPA Quantum Computing Program Review, "Optical Quantum Computing," 11–15 August 2008, Atlanta, GA.
24. NASA Ames Research Center Director's Distinguished Lecture Series, "Quantum Sensing," 23 July 2008, San Jose, California.
25. Northrop Grumman Space Technologies Seminar, "Quantum Technologies," 17 July 2008, Redondo Beach, California.
26. ARO Quantum Imaging MURI Program Review, "Quantum Lithography," 20–21 May 2008, University of Rochester, New York.
27. DARPA Quantum Sensor Program Review, "Quantum LIDAR — Remote Sensing at the Ultimate Limits," 5–6 March 2008, Park City, Utah.
28. ARO-IARPA Quantum Computing Program Review, "Linear Optical Quantum Computing Theory," 31 January 2008, University of Maryland, Baltimore.
29. Physics Colloquium, "Schrödinger's Rainbow," 11 October 2007, University of California, San Diego.
30. Solid-State Seminar, "Quantum Technologies," 10 October 2007, University of California, San Diego.
31. ARO MURI Program Review, "Quantum Imaging Theory," 1 October 2007, Boston, Massachusetts.
32. ARO-DTO Quantum Computing Program Review, "Optical Quantum Computing," 13–17 August 2007, Minneapolis, MN.
33. DARPA Quantum Sensors Meeting, "Quantum LIDAR," 2 August 2007, Pasadena, California.
34. Physics Department Colloquium, "Quantum Technologies," 25 April 2007, Tulane University, New Orleans, Louisiana.
35. NRO DII Program Review, "Photonic Crystals for Thermal Satellite Control," 2 March 2007, Chantilly, Virginia.

36. ARO MURI Quantum Imaging Program Review, "Quantum Lithography," 23–24 October, Ft. Belvoir, MD.
37. Director's Colloquium, "The Second Quantum Revolution," 18 September 2006, NASA Ames Research Center, Moffett Field, CA.
38. DTO Quantum Computing Program Review, "Linear Optical Quantum Sources, Processors, and Detectors," 22–26 August 2005, Tampa, FL.
39. ARO MURI Program Kick-Off, "Quantum Lithography," 9–10 June 2005, Rochester, NY.
40. DTO QCCM Program Kick-Off, "Linear Optical Quantum Sources, Processors, and Detectors," 4–6 July 2005, Champlain, Illinois.
41. NRO DII Program Review, "Improved Solar Cells Using Photonic Crystals," Chantilly, Maryland, 30 March 2005.
42. Beijing Normal University Quantum Optics Seminar, "Schrödinger's Rainbow: The Renaissance in Quantum Optical Interferometry," 20 December 2004.
43. Texas A&M Physics Colloquium, "Schrödinger's Rainbow: The Renaissance in Quantum Optical Interferometry," 28 October 2004.
44. University of Leeds Physics Colloquium, "Schrödinger's Rainbow: The Renaissance in Quantum Optical Interferometry," 15 January 2004.
45. Louisiana State University Physics Colloquium, "Schrödinger's Rainbow: The Renaissance in Quantum Optical Interferometry," 28 April 2003.
46. JPL All-Lab Lecture, "Schrödinger's Rainbow: The Renaissance in Quantum Optical Interferometry," 8 April 2003.
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