

# Alexey V. Gorshkov

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## Education

- Mar '10 **Ph.D. Physics**, *Harvard University*, Thesis: Novel Systems and Methods for Quantum Communication, Quantum Computation, and Quantum Simulation, Advisor: Mikhail D. Lukin.
- Jun '06 **A.M. (Master of Arts) Physics**, *Harvard University*.
- Jun '04 **A.B. (Bachelor of Arts) Physics and Mathematics**, *Harvard University*.  
Summa Cum Laude

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## Appointments

- Aug '13– **Fellow**, *Joint Quantum Institute (JQI)*.
- Oct '14– **Fellow**, *Joint Center for Quantum Information and Computer Science (QIICS)*.
- Aug '13– **Physicist**, *Quantum Measurement Division, National Institute of Standards and Technology (NIST)*.
- Aug '13– **Adjunct Assistant Professor**, *University of Maryland (UMD) Department of Physics*.
- Sep '10–Aug '13 **Lee A. DuBridge Postdoctoral Scholar in Theoretical Physics**, *Institute for Quantum Information and Matter (IQIM) at the California Institute of Technology*.
- Jan '10–Aug '10 **Postdoctoral Fellow in Physics**, *Harvard University Physics Department*.

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## Teaching Experience

- Fall 2015 **Atomic and Optical Physics I**.  
Co-teaching with Ian Spielman at the University of Maryland Department of Physics
- Fall 2014 **Atomic and Optical Physics I**.  
Co-teaching with Ian Spielman at the University of Maryland Department of Physics
- Fall 2008 **Topics in the Physics of Quantum Information**.  
Teaching fellow (unofficial) at the Harvard University Department of Physics
- Fall 2007 **Modern Atomic and Optical Physics**.  
Teaching fellow at the Harvard University Department of Physics  
Earned a Certificate of Distinction in Teaching
- Spring 2002 **Multivariable Calculus**.  
Course assistant at the Harvard University Department of Mathematics

Fall 2001 **Linear Algebra.**

Course assistant at the Harvard University Department of Mathematics

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## Honors and Awards

- Jun '11 One of four finalists for the 2011 Thesis Prize from the APS Division of AMO Physics
- Sep '10–Aug '13 Lee A. DuBridge Postdoctoral Fellowship from the California Institute of Technology
- '08 Graduate Society Merit Fellowship (John Parker Bequest Scholarship)
- '08 Gertrude and Maurice Goldhaber Prize to an outstanding graduate student
- '07 Certificate of Distinction in Teaching
- '04–'07 National Science Foundation Graduate Research Fellowship
- '05 Robbins Prize from the Harvard University Physics Department
- '04 Dr. Jack T. Sanderson Memorial Prize from Harvard College for excellence in the study of physics
- '03 Elected to Harvard's chapter of Phi Beta Kappa in the fall of senior year (one of the top 72 students out of the senior class of about 2000)
- '02–'03 Harvard College Scholarship for superior academic achievement
- '00–'02 John Harvard Scholarship for academic achievement of the highest distinction
- '01 Detur Prize from Harvard College for very high academic standing
- '97 2nd place in the All-Russian Mathematics Olympiad

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## Press

Our work on the realization of attractive and massive photons was chosen by Physics World as one of ten breakthroughs of 2013. It was also featured by CNN, the Guardian, and numerous other news media.

Our work on the observation of a dynamical phase transition with a 53-qubit quantum simulator was featured by Gizmodo, International Business Times, Discover Magazine, Science Daily, and numerous other news media.

Our work on the observation of three-photon bound states in a quantum nonlinear medium was featured by Newsweek and numerous other news media.

Our work on the use of an optical clock to study spin models was featured by the New Scientist, ElectronicsWeekly.com, Science World Report, and other news media.

Our experimental work on the non-local propagation of correlations and our theoretical work on the persistence of locality in systems with power-law interactions were featured by Science Daily, Newswise, Nanowerk, and other news media.

Our work on nearly linear light cones in long-range interacting quantum systems was featured by Science Daily, Nanotechnology Now, Phys.org, Scientific Computing, R&D Magazine, the ECN Magazine, and other news media.

Our work on Coulomb bound states of strongly interacting photons was selected as an Editors' Suggestion and was featured by Optics & Photonics News (OPN), photonics.com, and numerous other news media.

Our work on realizing a dark state optical lattice with sub-wavelength spatial structure was featured in a Physics Viewpoint and selected as an Editors' Suggestion.

Our work on simulating a generalized  $t$ - $J$  model with ultracold polar molecules was featured in a Physics Synopsis.

Our work on realizing fractional Chern insulators with dipolar spins was featured in a Physics Viewpoint and selected as an Editors' Suggestion.

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## Patents

Scalable Room Temperature Quantum Information Processor (Publication Number WO/2012/082938).

Determining a Modal Amplitude of an Inhomogeneous Field with a Quantum Sensor (filed; US 15650216).

Fast Entangled State Generation and Quantum Information Transfer in Quantum Systems with Long-Range Interactions (filed; US 15802146 and PCT/US2017/063892).

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## Students and Postdocs

- Sep '13–Dec '16 Mohammad Maghrebi, postdoc (University of Maryland); beginning Jan '17, Assistant Professor at Michigan State University
- Jun '13–Dec '17 Zhexuan Gong, postdoc and research scientist (University of Maryland); beginning Jan '18, Assistant Professor at the Colorado School of Mines
- Sep '16–Sep '17 Sergey Syzranov, postdoc (University of Maryland), co-advised; beginning Oct '17, Assistant Professor at the University of California, Santa Cruz
  - Aug '16– James Garrison, NRC postdoc (University of Maryland), co-advised
  - Aug '16– Paraj Titum, postdoc and NRC postdoc (University of Maryland)
  - Sep '16– Rex Lundgren, NRC postdoc (University of Maryland)
  - Oct '16– Przemyslaw Bienias, postdoc (University of Maryland)
  - Jun '14– Jeremy Young, Ph.D. student (University of Maryland)
  - Jun '14– Yidan Wang, Ph.D. student (University of Maryland)
  - Sep '14– Zachary Eldredge, Ph.D. student (University of Maryland)
  - Sep '15– Abhinav Deshpande, Ph.D. student (University of Maryland)
  - Sep '15– Fangli Liu, Ph.D. student (University of Maryland)
- Jun–Oct '11 Kevin Kuns, undergraduate summer student (California Institute of Technology)
- May–Aug '16 Pradeep Niroula, Harvard undergraduate spent summer at the University of Maryland
- Jun–Aug '17 Joseph Iosue, MIT undergraduate spent summer at the University of Maryland
  - Jan '18– Kevin Qian, Montgomery Blair high school student spent time at the University of Maryland

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## Professional and Outreach Activities

Referee for the following journals: Nature, Nature Physics, Nature Photonics, Nature Communications, Physical Review Letters, Physical Review X, Science Advances, Physical Review B, Reports on Progress in Physics, Physical Review A, New Journal of Physics, Optics Communications, Optics Letters, Applied Physics B, and EPL (Europhysics Letters).

Reviewer and review panel member for NSF (QIS, TAMOP, CMP).

Reviewer for AFOSR and ARO.

Review panel member for reviewing the work of ARL employees.

Led the organization (with the help of Jason Alicea, Dima Abanin, Frank Verstraete, and Leo Radzihovsky) of a 13-week KITP program on Synthetic Quantum Matter, Sep. 12, 2016 - Dec. 9, 2016.

Together with Dima Abanin, Ehud Altman, and Victor Galitski, organized a KITP conference "Designer Quantum Systems out of Equilibrium", Nov. 14-18, 2016.

Judge for the Buck Lodge Middle School Virtual Science Fair (annually, 2015 - present).

Volunteer at Maryland Day (annually, 2015 - present).

Volunteer at the USA Science and Engineering Festival, 2016.

Launched (in 2014) and oversee the operation of a weekly joint JQI-QuICS-CMTC seminar at the University of Maryland, during which local students and postdocs from all three quantum centers give talks about their research.

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## Papers Published in or Submitted to Peer-Reviewed Journals

92. N. M. Sundaresan, R. Lundgren, G. Zhu, A. V. Gorshkov, A. A. Houck, *Interacting Qubit-Photon Bound States with Superconducting Circuits*, arXiv:1801.10167 [quant-ph].
91. Y. Wang, S. Subhankar, P. Bienias, M. Łącki, T.-C. Tsui, M. A. Baranov, A. V. Gorshkov, P. Zoller, J. V. Porto, and S. L. Rolston, *Dark state optical lattice with sub-wavelength spatial structure*, Phys. Rev. Lett. 120, 083601 (2018); arXiv:1712.00655 [cond-mat.quant-gas]. Selected as an Editors' Suggestion. Featured in a Physics Viewpoint: B. Gadway, Physics 11, 19 (2018).
90. C. R. Murray, I. Mirgorodskiy, C. Tresp, C. Braun, A. Paris-Mandoki, A. V. Gorshkov, S. Hofferberth, and T. Pohl, *Photon Subtraction by Many-Body Decoherence*, Phys. Rev. Lett. (in press); arXiv:1710.10047 [quant-ph].
89. M. T. Manzoni, M. Moreno-Cardoner, A. Asenjo-Garcia, J. V. Porto, A. V. Gorshkov, and D. E. Chang, *Optimization of photon storage fidelity in ordered atomic arrays*, arXiv:1710.06312 [quant-ph].

88. J. T. Young, T. Boulier, E. Magnan, E. A. Goldschmidt, R. M. Wilson, S. L. Rolston, J. V. Porto, A. V. Gorshkov,  
*Dissipation induced dipole blockade and anti-blockade in driven Rydberg systems*,  
Phys. Rev. A (in press); arXiv:1710.01752 [quant-ph].
87. S. V. Syzranov, A. V. Gorshkov, V. M. Galitski,  
*Interaction-induced transition in the quantum chaotic dynamics of a disordered metal*,  
arXiv:1709.09296 [cond-mat.mes-hall].
86. T. Boulier, E. Magnan, C. Bracamontes, J. Maslek, E. A. Goldschmidt, J. T. Young, A. V. Gorshkov, S. L. Rolston, J. V. Porto,  
*Spontaneous avalanche dephasing in large Rydberg ensembles*,  
Phys. Rev. A 96, 053409 (2017); arXiv:1709.02460 [quant-ph].
85. M. J. Gullans, S. Diehl, S. T. Rittenhouse, B. P. Ruzic, J. P. D’Incao, P. Julienne, A. V. Gorshkov, J. M. Taylor,  
*Efimov States of Strongly Interacting Photons*,  
Phys. Rev. Lett. 119, 233601 (2017); arXiv:1709.01955 [physics.atom-ph].
84. Q.-Y. Liang, A. V. Venkatramani, S. H. Cantu, T. L. Nicholson, M. J. Gullans, A. V. Gorshkov, J. D. Thompson, C. Chin, M. D. Lukin, V. Vuletic,  
*Observation of three-photon bound states in a quantum nonlinear medium*,  
Science 359, 783 (2018); arXiv:1709.01478 [quant-ph].  
Featured by Newsweek and numerous other news media.
83. J. Zhang, G. Pagano, P. W. Hess, A. Kyprianidis, P. Becker, H. Kaplan, A. V. Gorshkov, Z.-X. Gong, C. Monroe,  
*Observation of a Many-Body Dynamical Phase Transition with a 53-Qubit Quantum Simulator*,  
Nature 551, 601 (2017); arXiv:1708.01044 [quant-ph].  
Featured by Gizmodo, International Business Times, Discover Magazine, Science Daily, and numerous other news media.
82. W. Ge, K. Jacobs, Z. Eldredge, A. V. Gorshkov, M. Foss-Feig,  
*Distributed Quantum Metrology and the Entangling Power of Linear Networks*,  
arXiv:1707.06655 [quant-ph].
81. M. C. Tran, J. R. Garrison, Z.-X. Gong, A. V. Gorshkov,  
*Lieb-Robinson bounds on  $n$ -partite connected correlations*,  
Phys. Rev. A 96, 052334 (2017); arXiv:1705.04355 [quant-ph].
80. S.V. Syzranov, A. V. Gorshkov, V. Galitski,  
*Out-of-time-order correlators in finite open systems*,  
arXiv:1704.08442 [cond-mat.mes-hall].
79. A. Deshpande, B. Fefferman, M. Foss-Feig, A. V. Gorshkov,  
*Complexity of sampling as an order parameter*,  
arXiv:1703.05332 [quant-ph].
78. M. Foss-Feig, J. T. Young, V. V. Albert, A. V. Gorshkov, M. F. Maghrebi,  
*A solvable family of driven-dissipative many-body systems*,  
Phys. Rev. Lett. 119, 190402 (2017); arXiv:1703.04626 [quant-ph].

77. M. Foss-Feig, Z.-X. Gong, A. V. Gorshkov, and C. W. Clark,  
*Entanglement and spin-squeezing without infinite-range interactions*,  
arXiv:1612.07805 [cond-mat.quant-gas].
76. Z. Eldredge, Z.-X. Gong, J. T. Young, A. Hamed Moosavian, M. Foss-Feig, A. V. Gorshkov,  
*Fast Quantum State Transfer and Entanglement Renormalization Using Long-Range Interactions*,  
Phys. Rev. Lett. 119, 170503 (2017); arXiv:1612.02442 [quant-ph].
75. Z.-X. Gong, M. Xu, M. Foss-Feig, J. K. Thompson, A. M. Rey, M. Holland, A. V. Gorshkov,  
*Steady-state superradiance with Rydberg polaritons*,  
arXiv:1611.00797 [quant-ph].
74. M. E. Beverland, J. Haah, G. Alagic, G. K. Campbell, A. M. Rey, A. V. Gorshkov,  
*Spectrum estimation of density operators with alkaline-earth atoms*,  
Phys. Rev. Lett. 120, 025301 (2018); arXiv:1608.02045 [quant-ph].
73. Z. Eldredge, M. Foss-Feig, J. A. Gross, S. L. Rolston, A. V. Gorshkov,  
*Optimal and Secure Measurement Protocols for Quantum Sensor Networks*,  
arXiv:1607.04646 [quant-ph].  
Selected for the Hot Topics session of QCrypt 2016.
72. B. Neyenhuis, J. Smith, A. C. Lee, J. Zhang, P. Richerme, P. W. Hess, Z.-X. Gong, A. V. Gorshkov, C. Monroe,  
*Observation of Prethermalization in Long-Range Interacting Spin Chains*,  
Sci. Adv. 3, e1700672 (2017); arXiv:1608.00681 [quant-ph].
71. B. Fefferman, M. Foss-Feig, A. V. Gorshkov,  
*Exact sampling hardness of Ising spin models*,  
Phys. Rev. A 96, 032324 (2017); arXiv:1701.03167 [quant-ph].
70. Z.-X. Gong, M. Foss-Feig, F. G. S. L. Brandão, A. V. Gorshkov,  
*Entanglement area laws for long-range interacting systems*,  
Phys. Rev. Lett. 119, 050501 (2017); arXiv:1702.05368 [quant-ph].
69. E. Zeuthen, M. J. Gullans, M. F. Maghrebi, A. V. Gorshkov,  
*Correlated photon dynamics in dissipative Rydberg media*,  
Phys. Rev. Lett. 119, 043602 (2017); arXiv:1608.06068 [quant-ph].
68. M. F. Maghrebi, Z.-X. Gong, A. V. Gorshkov,  
*Continuous symmetry breaking and a new universality class in 1D long-range interacting quantum systems*,  
Phys. Rev. Lett. 119, 023001 (2017); arXiv:1510.01325 [cond-mat.quant-gas].
67. V. R. Overbeck, M. F. Maghrebi, A. V. Gorshkov, H. Weimer,  
*Multicritical behavior in dissipative Ising models*,  
Phys. Rev. A 95, 042133 (2017); arXiv:1606.08863 [cond-mat.stat-mech].
66. M. Foss-Feig, P. Niroula, J. T. Young, M. Hafezi, A. V. Gorshkov, R. M. Wilson, M. F. Maghrebi,  
*Emergent equilibrium in many-body optical bistability*,  
Phys. Rev. A 95, 043826 (2017); arXiv:1611.02284 [quant-ph].

65. S. Ganeshan, A. V. Gorshkov, V. Gurarie, V. M. Galitski,  
*Exactly soluble model of boundary degeneracy*,  
Phys. Rev. B 95, 045309 (2017); arXiv:1604.02089 [cond-mat.str-el].  
Selected as an Editors' Suggestion.
64. F. Jendrzejewski, S. Eckel, T. G. Tiecke, G. Juzeliūnas, G. K. Campbell, L. Jiang, A. V. Gorshkov,  
*Subwavelength-width optical tunnel junctions for ultracold atoms*,  
Phys. Rev. A 94, 063422 (2016); arXiv:1609.01285 [cond-mat.quant-gas].
63. Z. Eldredge, P. Solano, D. Chang, A. V. Gorshkov,  
*Self-organization of atoms coupled to a chiral reservoir*,  
Phys. Rev. A 94, 053855 (2016); arXiv:1605.06522 [quant-ph].
62. C. R. Murray, A. V. Gorshkov, T. Pohl,  
*Many-body decoherence dynamics and optimized operation of a single-photon switch*,  
New J. Phys. 18, 092001 (2016); arXiv:1607.01984 [quant-ph].
61. R. M. Wilson, K. W. Mahmud, A. Hu, A. V. Gorshkov, M. Hafezi, M. Foss-Feig,  
*Collective phases of strongly interacting cavity photons*,  
Phys. Rev. A 94, 033801 (2016); arXiv:1601.06857 [quant-ph].
60. M. J. Gullans, Y. Wang, J. D. Thompson, Q.-Y. Liang, V. Vuletic, M. D. Lukin, A. V. Gorshkov,  
*Effective Field Theory for Rydberg Polaritons*,  
Phys. Rev. Lett. 117, 113601 (2016); arXiv:1605.05651 [physics.atom-ph].
59. Z.-X. Gong, M. F. Maghrebi, A. Hu, M. Foss-Feig, P. Richerme, C. Monroe, A. V. Gorshkov,  
*Kaleidoscope of quantum phases in a long-range interacting spin-1 chain*,  
Phys. Rev. B 93, 205115 (2016); arXiv:1510.02108 [cond-mat.str-el].
58. M. E. Beverland, G. Alagic, M. J. Martin, A. P. Koller, A. M. Rey, and A. V. Gorshkov,  
*Realizing Exactly Solvable  $SU(N)$  Magnets with Thermal Atoms*,  
Phys. Rev. A 93, 051601(R) (2016); arXiv:1409.3234 [cond-mat.quant-gas].
57. E. A. Goldschmidt, T. Boulier, R. C. Brown, S. B. Koller, J. T. Young, A. V. Gorshkov, S. L. Rolston, J. V. Porto,  
*Anomalous broadening in driven dissipative Rydberg systems*,  
Phys. Rev. Lett. 116, 113001 (2016); arXiv:1510.08710 [quant-ph].
56. M. F. Maghrebi, Z.-X. Gong, M. Foss-Feig, A. V. Gorshkov,  
*Causality and quantum criticality in long-range lattice models*,  
Phys. Rev. B 93, 125128 (2016); arXiv:1508.00906 [cond-mat.quant-gas].
55. M. F. Maghrebi and A. V. Gorshkov,  
*Nonequilibrium many-body steady states via Keldysh formalism*,  
Phys. Rev. B 93, 014307 (2016); arXiv:1507.01939 [cond-mat.quant-gas].
54. Z.-X. Gong, M. F. Maghrebi, A. Hu, M. L. Wall, M. Foss-Feig, and A. V. Gorshkov,  
*Topological phases with long-range interactions*,  
Phys. Rev. B 93, 041102(R) (2016); arXiv:1505.03146 [cond-mat.quant-gas].

53. N. Y. Yao, S. D. Bennett, C. R. Laumann, B. L. Lev, and A. V. Gorshkov, *Bilayer fractional quantum Hall states with dipoles*, Phys. Rev. A 92, 033609 (2015); arXiv:1505.03099 [cond-mat.quant-gas].
52. M. F. Maghrebi, M. J. Gullans, P. Bienias, S. Choi, I. Martin, O. Firstenberg, M. D. Lukin, H. P. Büchler, and A. V. Gorshkov, *Coulomb bound states of strongly interacting photons*, Phys. Rev. Lett. 115, 123601 (2015); arXiv:1505.03859 [quant-ph].  
Selected as an Editors' Suggestion. Featured by Optics & Photonics News (OPN), photonics.com, and numerous other news media.
51. M. F. Maghrebi, S. Ganeshan, D. J. Clarke, A. V. Gorshkov, and J. D. Sau, *Parafermionic zero modes in ultracold bosonic systems*, Phys. Rev. Lett. 115, 065301 (2105); arXiv:1504.04012 [cond-mat.quant-gas].
50. M. F. Maghrebi, N. Y. Yao, M. Hafezi, T. Pohl, O. Firstenberg, and A. V. Gorshkov, *Fractional Quantum Hall States of Rydberg Polaritons*, Phys. Rev. A 91, 033838 (2015); arXiv:1411.6624 [cond-mat.quant-gas].
49. M. Foss-Feig, Z.-X. Gong, C. W. Clark, and A. V. Gorshkov, *Nearly-linear light cones in long-range interacting quantum systems*, Phys. Rev. Lett. 114, 157201 (2015); arXiv:1410.3466 [quant-ph].  
Featured by Science Daily, Nanotechnology Now, Phys.org, Scientific Computing, R&D Magazine, and the ECN Magazine.
48. J. S. Douglas, H. Habibian, C.-L. Hung, A. V. Gorshkov, H. J. Kimble, and D. E. Chang, *Quantum many-body models with cold atoms coupled to photonic crystals*, Nature Photon. 9, 326 (2015); arXiv:1312.2435 [quant-ph].
47. P. Bienias, S. Choi, O. Firstenberg, M. F. Maghrebi, M. Gullans, M. D. Lukin, A. V. Gorshkov, and H. P. Büchler, *Scattering resonances and bound states for strongly interacting Rydberg polaritons*, Phys. Rev. A 90, 053804 (2014); arXiv:1402.7333 [quant-ph].
46. D. Vodola, L. Lepori, E. Ercolessi, A. V. Gorshkov and G. Pupillo, *Kitaev chains with long-range pairing*, Phys. Rev. Lett. 113, 156402 (2014); arXiv:1405.5440 [cond-mat.str-el].
45. Z.-X. Gong, M. Foss-Feig, S. Michalakis, and A. V. Gorshkov, *Persistence of locality in systems with power-law interactions*, Phys. Rev. Lett. 113, 030602 (2014); arXiv:1401.6174 [quant-ph].
44. P. Richerme, Z.-X. Gong, A. Lee, C. Senko, J. Smith, M. Foss-Feig, S. Michalakis, A. V. Gorshkov, and C. Monroe, *Non-local propagation of correlations in long-range interacting quantum systems*, Nature 511, 198 (2014); arXiv:1401.5088 [quant-ph].
43. A. P. Koller, M. Beverland, A. V. Gorshkov, and A. M. Rey, *Beyond the spin model approximation for Ramsey spectroscopy*, Phys. Rev. Lett. 112, 123001 (2014); arXiv:1312.0887 [physics.atom-ph].



42. A. M. Rey, A. V. Gorshkov, C.V. Kraus, M. J. Martin, M. Bishof, M. D. Swallows, X. Zhang, C. Benko, J. Ye, N.D. Lemke, and A.D. Ludlow,  
*Probing many-body interactions in an optical lattice clock*,  
Ann. Phys. 430, 311 (2014); arXiv:1310.5248 [cond-mat.quant-gas].
41. O. Firstenberg, T. Peyronel, Q.-Y. Liang, A. V. Gorshkov, M. D. Lukin, and V. Vuletić,  
*Attractive Photons in a Quantum Nonlinear Medium*,  
Nature (London) 502, 71 (2013).  
Chosen by Physics World as one of ten breakthroughs of 2013. Featured by CNN, the Guardian, and numerous other news media.
40. M. Lemesko, N. Y. Yao, A. V. Gorshkov, H. Weimer, S. D. Bennett, T. Momose, and S. Gopalakrishnan,  
*Controllable quantum spin glasses with magnetic impurities embedded in quantum solids*,  
Phys. Rev. B 88, 014426 (2013); arXiv:1307.1130 [cond-mat.quant-gas].
39. A. V. Gorshkov and K. R. A. Hazzard and A. M. Rey,  
*Kitaev honeycomb and other exotic spin models with polar molecules*,  
Mol. Phys. 111, 1908 (2013); arXiv:1301.5636 [cond-mat.quant-gas].
38. M. J. Martin, M. Bishof, M. D. Swallows, X. Zhang, C. Benko, J. von-Stecher, A. V. Gorshkov, A. M. Rey, and J. Ye,  
*A quantum many-body spin system in an optical lattice clock*,  
Science 341, 632 (2013); arXiv:1212.6291 [physics.atom-ph].  
Featured by the New Scientist, ElectronicsWeekly.com, Science World Report, and other news media.
37. N. Y. Yao, A. V. Gorshkov [co-first author], C. R. Laumann, A. Läuchli, J. Ye, and M. D. Lukin,  
*Realizing Fractional Chern Insulators with Dipolar Spins*,  
Phys. Rev. Lett. 110, 185302 (2013); arXiv:1212.4839 [cond-mat.str-el].  
Selected as an Editors' Suggestion. Featured in a Physics Viewpoint: M. Daghofer and M. Haque, Physics 6, 49 (2013).
36. A. V. Gorshkov, R. Nath, and T. Pohl,  
*Dissipative Many-body Quantum Optics in Rydberg Media*,  
Phys. Rev. Lett. 110, 153601 (2013); arXiv:1211.7060 [quant-ph].
35. S. R. Manmana, E. M. Stoudenmire, K. R. A. Hazzard, A. M. Rey, A. V. Gorshkov,  
*Topological phases in ultracold polar-molecule quantum magnets*,  
Phys. Rev. B 87, 081106(R) (2013); arXiv:1210.5518 [cond-mat.quant-gas].
34. N. Y. Yao, Z.-X. Gong, C. R. Laumann, S. D. Bennett, L.-M. Duan, M. D. Lukin, L. Jiang, A. V. Gorshkov,  
*Quantum Logic between Remote Quantum Registers*,  
Phys. Rev. A 87, 022306 (2013); arXiv:1206.0014 [quant-ph].
33. N. Y. Yao, C. R. Laumann, A. V. Gorshkov, H. Weimer, L. Jiang, J. I. Cirac, P. Zoller, and M. D. Lukin,  
*Topologically Protected Quantum State Transfer in a Chiral Spin Liquid*,  
Nat. Commun. 4, 1585 (2013); arXiv:1110.3788 [quant-ph].

32. N. Y. Yao, C. R. Laumann, A. V. Gorshkov [co-first author], S. D. Bennett, E. Demler, P. Zoller, M. D. Lukin,  
*Topological Flat Bands from Dipolar Spin Systems*,  
Phys. Rev. Lett. 109, 266804 (2012); arXiv:1207.4479 [cond-mat.str-el].
31. T. Peyronel, O. Firstenberg, Q.-Y. Liang, S. Hofferberth, A. V. Gorshkov, T. Pohl, M. D. Lukin, and V. Vuletić,  
*Quantum Nonlinear Optics with Single Photons Enabled by Strongly Interacting Atoms*,  
Nature (London) 488, 57 (2012).
30. D. E. Chang, L. Jiang, A. V. Gorshkov, and H. J. Kimble,  
*Cavity QED with atomic mirrors*,  
New J. Phys. 14, 063003 (2012); arXiv:1201.0643 [quant-ph].
29. N. Y. Yao, L. Jiang, A. V. Gorshkov [co-first author], P. C. Maurer, G. Giedke, J. I. Cirac, and M. D. Lukin,  
*Scalable Architecture for a Room Temperature Solid-State Quantum Information Processor*,  
Nat. Commun. 3, 800 (2012); arXiv:1012.2864 [quant-ph].
28. K. A. Kuns, A. M. Rey, A. V. Gorshkov,  
*d-Wave Superfluidity in Optical Lattices of Ultracold Polar Molecules*,  
Phys. Rev. A 84, 063639 (2011); arXiv:1110.5330 [cond-mat.quant-gas].
27. K. R. A. Hazzard, A. V. Gorshkov, and A. M. Rey,  
*Spectroscopy of dipolar fermions in 2D pancakes and 3D lattices*,  
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4. A. V. Gorshkov, A. André, M. D. Lukin, and A. S. Sørensen,  
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3. A. V. Gorshkov, A. André, M. D. Lukin, and A. S. Sørensen,  
*Photon Storage in  $\Lambda$ -Type Optically Dense Atomic Media. II. Free Space Model*,  
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2. A. V. Gorshkov, A. André, M. D. Lukin, and A. S. Sørensen,  
*Photon Storage in  $\Lambda$ -Type Optically Dense Atomic Media. I. Cavity Model*,  
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## Other Publications

5. A.V. Gorshkov,  
*Quantum gases: The high-symmetry switch*,  
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4. O. Firstenberg, M.D. Lukin, T. Peyronel, Q.-Y. Liang, V. Vuletic, A.V. Gorshkov, S. Hofferberth, and T. Pohl, *Quantum Nonlinear Optics: Strongly Interacting Photons*, Opt. Photonics News 24, 48 (2013).
3. M. Klein, Y. Xiao, A. V. Gorshkov, M. Hohensee, C. D. Leung, M. R. Browning, D. F. Phillips, I. Novikova, and R. L. Walsworth, *Optimizing Slow and Stored Light for Multidisciplinary Applications*, Proc. SPIE 6904, 69040C (2008); arXiv:0807.4941 [quant-ph].
2. P. Walther, M. D. Eisaman, A. Nemiroski, A. V. Gorshkov, A. S. Zibrov, A. Zeilinger, and M. D. Lukin, *Multi-photon Entanglement: From Quantum Curiosity to Quantum Computing and Quantum Repeaters*, Proc. SPIE 6664, 66640G (2007).
1. I. Novikova, A. V. Gorshkov, D. F. Phillips, Y. Xiao, M. Klein, and R. L. Walsworth, *Optimization of Slow and Stored Light in Atomic Vapor*, Proc. SPIE 6482, 64820M (2007).

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### Invited Talks

112. *Complexity of Sampling as an Order Parameter*, The 48th Winter Colloquium on the Physics of Quantum Electronics, Snowbird, UT, USA, January 2017.
111. *Complexity of Sampling as an Order Parameter*, KITP program “Quantum Physics of Information”, Kavli Institute for Theoretical Physics, Santa Barbara, CA, USA, November 2017.
110. *Optimal Quantum Sensing*, Canadian Institute for Advanced Research (CIFAR) Quantum Information Science Meeting, Niagara-on-the-Lake, ON, Canada, October 2017.
109. *Optimal and Secure Measurement Protocols for Quantum Sensor Networks*, International Workshop on Quantum Sensing with Quantum Correlated Systems, Max Planck Institute for the Physics of Complex Systems, Dresden, Germany, September 2017.
108. *Complexity of Sampling as an Order Parameter*, Workshop “The many facets of non-equilibrium physics: from many body theory to quantum thermodynamics,” Mazara del Vallo, Sicily, Italy, September 2017.
107. *Optimal Quantum Sensing*, CQuIC Seminar, University of New Mexico, Albuquerque, NM, USA, August 2017.
106. *Quantum Computers, Quantum Internet, and Quantum Sensors*, Science Foo Camp (“Sci Foo”) 2017, Googleplex, Mountain View, CA, USA, August 2017.
105. *Entanglement Generation and Area Law with Long-Range Interactions*, Workshop “Frontiers of Interacting Systems of Rydberg Atoms,” ITAMP, Cambridge, MA, USA, June 2017.
104. *Few-Body and Many-Body Physics with Rydberg Polaritons*, 2017 Conference “Quantum Fluids of Light and Matter” (QFLM), Cargèse, Corsica, France, May 2017.

103. *Few-Body and Many-Body Physics with Rydberg Polaritons*, Workshop on quantum light-matter interactions in low dimensions, Institute of Photonic Sciences (ICFO), Castelldefels, Spain, May 2017.
102. *Entanglement Generation and Area Law with Long-Range Interactions*, APS March Meeting, New Orleans, LA, USA, March 2017.
101. *Optimal Quantum Sensing*, Electrical Engineering Department Seminar, Princeton University, Princeton, NJ, USA, February 2017.
100. *Few-Body and Many-Body Physics with Rydberg Polaritons*, The 47th Winter Colloquium on the Physics of Quantum Electronics, Snowbird, UT, USA, January 2017.
99. *Entanglement renormalization and area law with long-range interactions*, Conference on Topological Orders and Emergent Spacetime on Quantum Simulators, Fudan University, Shanghai, China, December 2016.
98. *Applications of Quantum Communication*, Future Directions of Quantum Information Processing Workshop, Basic Research Innovation and Collaboration Center (BRICC), Arlington, VA, USA, August 2016.
97. *Harnessing Quantum Systems with Long-Range Interactions*, Canadian Institute for Advanced Research (CIFAR) Quantum Information Science Program Meeting, University of Maryland, College Park, MD, USA, April 2016.
96. *Harnessing Quantum Systems with Long-Range Interactions*, Atomic Physics Seminar, University of California, Berkeley, CA, USA, March 2016.
95. *Harnessing Quantum Systems with Long-Range Interactions*, James Franck Institute Seminar, University of Chicago, Chicago, IL, USA, February 2016.
94. *Interacting photons*, Meeting of UMD Society of Physics Students, University of Maryland, College Park, MD, USA, February 2016.
93. *Harnessing Quantum Systems with Long-Range Interactions*, Physics and Astronomy Colloquium, Dartmouth College, Hannover, NH, USA, February 2016.
92. *Harnessing Quantum Systems with Long-Range Interactions*, Solid State Seminar, Technion, Haifa, Israel, January 2016.
91. *Topological Phases in Atomic, Molecular, and Optical Systems*, Optics and Atomic Physics Seminar, Weizmann Institute, Rehovot, Israel, January 2016.
90. *Topological Phases in Atomic, Molecular, and Optical Systems*, Physics Colloquium, Bar-Ilan University, Ramat Gan, Israel, January 2016.
89. *Harnessing Quantum Systems with Long-Range Interactions*, The 46th Winter Colloquium on the Physics of Quantum Electronics, Snowbird, UT, USA, January 2016.
88. *Topological Phases in Atomic, Molecular, and Optical Systems*, IQI Seminar, Institute for Quantum Information, IQIM, Caltech, Pasadena, CA, USA, October 2015.
87. *Few-Body and Many-Body Physics with Rydberg Polaritons*, KITP conference "Non-equilibrium dynamics of strongly interacting photons," Kavli Institute for Theoretical Physics, Santa Barbara, CA, USA, October 2015.

86. *Topological Phases in Atomic, Molecular, and Optical Systems*, BIRS workshop on Strongly Interacting Topological Phases, Banff, Canada, September 2015.
85. *Few-Body and Many-Body Physics with Rydberg Polaritons*, Workshop "Light-matter interactions in low dimensions," ITAMP, Cambridge, MA, USA, July 2015.
84. *Harnessing Quantum Systems with Long-Range Interactions*, Atomic Physics Gordon Research Conference, Salve Regina University, Newport, RI, USA, June 2015.
83. *Propagation of information in quantum systems with long-range interactions*, Workshop "Quantum Many-Body Systems Far from Equilibrium," Stellenbosch, South Africa, March 2015.
82. *Abelian and non-Abelian topological phases with dipoles*, APS March Meeting, San Antonio, TX, USA, March 2015.
81. *Optimal Spectrum Estimation of Density Operators with Alkaline-Earth Atoms*, APS March Meeting, San Antonio, TX, USA, March 2015.
80. *Few-Body and Many-Body Physics with Rydberg Polaritons*, Workshop on Polaron blockade effects in Rydberg atoms and Semiconductors (POLARYS), Institut d'Optique, Palaiseau, France, December 2014.
79. *Propagation of information in systems with power-law interactions (focus on ion chains)*, Workshop "Quantum Science: Implementations," Centro de Ciencias de Benasque Pedro Pascual, Benasque, Spain, July 2014.
78. *Harnessing Quantum Systems with Long-Range Interactions*, Colloquium, Heidelberg Center for Quantum Dynamics, Heidelberg, Germany, July 2014.
77. *Harnessing Quantum Systems with Long-Range Interactions*, Seminar, Institute of Photonic Sciences (ICFO), Castelldefels, Spain, June 2014.
76. *Harnessing Quantum Systems with Long-Range Interactions*, Quantum Lunch, Los Alamos National Laboratory, Los Alamos, NM, USA, June 2014.
75. *Harnessing Quantum Systems with Long-Range Interactions*, IQI Seminar, Institute for Quantum Information, IQIM, Caltech, Pasadena, CA, USA, April 2014.
74. *Dynamics of Quantum Systems with Long-Range Interactions*, APS March Meeting, Denver, USA, March 2014.
73. *Persistence of locality in systems with power-law interactions*, Workshop "What do we do with a small quantum computer?," IBM T.J. Watson Research Center, Yorktown Heights, NY, USA, December 2013.
72. *Lightsabers in the Making: Quantum Nonlinear Optics at the Single-Photon Level*, Physics Colloquium, Georgetown University, Washington, DC, USA, December 2013.
71. *Propagation of information in systems with long-range interactions*, Workshop on Quantum Dynamics of Low-Dimensional Systems in memory of Adilet Imambekov, Harvard University, Cambridge, MA, USA, September 2013.
70. *Quantum Nonlinear Optics at the Single-Photon Level*, CAMP Seminar, Penn State University, University Park, PA, USA, September 2013.

69. *Quantum Nonlinear Optics at the Single-Photon Level*, Second International Conference on Quantum Technologies, Russian Quantum Center, Moscow, Russia, July 2013.
68. *Dissipative Many-body Quantum Optics in Rydberg Media*, International workshop on Ultracold Rydberg Physics, Max Planck Institute for the Physics of Complex Systems, Dresden, Germany, July 2013.
67. *Quantum Nonlinear Optics at the Single-Photon Level*, International Conference on Quantum Information Processing and Communication (QIPC), Florence, Italy, July 2013.
66. *Realizing Topological Phases with Dipolar Spins*, 44th meeting of the APS Division of AMO Physics (DAMOP), Quebec City, Quebec, Canada, June 2013.
65. *Realizing Topological Phases with Dipolar Spins*, KITP conference “New Science with Ultracold Molecules,” Kavli Institute for Theoretical Physics, Santa Barbara, CA, USA, March 2013.
64. *Realizing Topological Phases with Dipolar Spins*, BIRS workshop on Topological Phenomena in Quantum Dynamics and Disordered Systems, Banff, Canada, February 2013.
63. *Harnessing Quantum Systems with Long-Range Interactions*, JQI Seminar, Joint Quantum Institute, University of Maryland, College Park, MD, USA, January 2013.
62. *Topological Phases in Polar-Molecule Quantum Magnets*, KITP program Fundamental Science and Applications of Ultra-cold Polar Molecules, Kavli Institute for Theoretical Physics, Santa Barbara, CA, USA, January 2013.
61. *Topological Phases in Polar-Molecule Quantum Magnets*, The 43rd Winter Colloquium on the Physics of Quantum Electronics, Snowbird, UT, USA, January 2013.
60. *Quantum gases with long-range interactions: from topological phases to interacting photons*, AMO Seminar, JILA, University of Colorado, Boulder, CO, USA, December 2012.
59. *Topological Phases in Polar-Molecule Quantum Magnets*, Seminar, Joint Quantum Institute, NIST, and the University of Maryland, College Park, MD, USA, December 2012.
58. *Topological Phases in Polar-Molecule Quantum Magnets*, AMO Physics Seminar, Department of Physics & Astronomy, University of California, Los Angeles, CA, USA, November 2012.
57. *Quantum Nonlinear Optics with Single Photons*, COHERENCE workshop on Rydberg atoms, CNRS, Gif-sur-Yvette, France, July 2012.
56. *Many-Body Physics with Atomic, Molecular and Optical Systems*, Guest lecture in *Physics 135c - Quantum Mechanics: elementary particles and the universe*, California Institute of Technology, Pasadena, CA, USA, April 2012.
55. *Quantum Magnetism with Polar Molecules: Tunable Generalized  $t$ - $J$  Model*, Seminar, Institute for Quantum Information and Matter, California Institute of Technology, Pasadena, CA, USA, March 2012.



54. *Many-Body Physics with Atomic, Molecular and Optical Systems and Methods*, Seminar, Department of Electrical & Computer Engineering, Boston University, Boston, MA, USA, March 2012.
53. *Many-Body Physics with Atomic, Molecular and Optical Systems and Methods*, Seminar, Department of Physics, University of Cambridge, Cambridge, UK, February 2012.
52. *Many-Body Physics with Atomic, Molecular and Optical Systems and Methods*, Seminar, Imperial College London, London, UK, February 2012.
51. *Many-Body Physics with Atomic, Molecular and Optical Systems and Methods*, Seminar, Department of Physics & Astronomy, University of Pittsburgh, Pittsburgh, PA, USA, February 2012.
50. *Many-Body Physics with Atomic, Molecular and Optical Systems and Methods*, Seminar, Department of Applied Physics, Yale University, New Haven, CT, USA, February 2012.
49. *Many-Body Physics with Atomic, Molecular and Optical Systems and Methods*, CQuIC seminar, University of New Mexico, Albuquerque, NM, USA, January 2012.
48. *Many-Body Physics with Atomic, Molecular and Optical Systems*, Seminar, Physics Department, University of Michigan, Ann Arbor, MI, USA, January 2012.
47. *Many-Body Physics with Atomic, Molecular and Optical Systems and Methods*, Seminar, Perimeter Institute, Waterloo, Canada, January 2012.
46. *Many-Body Physics with Atomic, Molecular and Optical Systems and Methods*, Seminar, University of Waterloo, Waterloo, Canada, January 2012.
45. *Many-Body Physics with Atomic, Molecular and Optical Systems and Methods*, Seminar, Applied Physics Department, Stanford University, Stanford, CA, USA, January 2012.
44. *Many-Body Physics with Atomic, Molecular and Optical Systems and Methods*, Seminar, IQOQI, University of Innsbruck, Innsbruck, Austria, December 2011.
43. *Many-Body Physics with Atomic, Molecular and Optical Systems and Methods*, Seminar, University College London, London, UK, November 2011.
42. *Ultracold Polar Molecules to the Rescue*, PMA Chair's Council Meeting, California Institute of Technology, Pasadena, CA, USA, November 2011.
41. *Photon-Photon Interactions via Rydberg Blockade*, Seminar, Institut d'Optique, Palaiseau, France, October 2011.
40. *Photon-Photon Interactions via Rydberg Blockade*, Workshop on Engineering and Control of Quantum Systems, Max Planck Institute for the Physics of Complex Systems, Dresden, Germany, October 2011.
39. *Quantum Magnetism with Polar Molecules: Tunable Generalized  $t$ - $J$  Model*, Quantum Dynamics Seminar, Max Planck Institute for the Physics of Complex Systems, Dresden, Germany, October 2011.

38. *Subwavelength Lattices*, Topical Group: Fundamental Science with Ultracold Molecules, Institute for Theoretical AMO Physics, Harvard University, Cambridge, MA, USA, September 2011.
37. *Quantum Magnetism with Polar Molecules: Tunable Generalized t-J Model*, Topical Group: Fundamental Science with Ultracold Molecules, Institute for Theoretical AMO Physics, Harvard University, Cambridge, MA, USA, September 2011.
36. *Photon-Photon Interactions via Rydberg Blockade*, International Conference on Quantum Technologies, Russian Quantum Center, Moscow, Russia, July 2011.
35. *Novel Systems and Methods for Quantum Communication, Quantum Computation, and Quantum Simulation*, Meeting of the APS Division of AMO Physics, Atlanta, GA, USA, June 2011.
34. *Photon-Photon Interactions via Rydberg Blockade*, Seminar, Center for Exotic Quantum Systems, California Institute of Technology, Pasadena, CA, USA, May 2011.
33. *Two-Orbital SU(N) Magnetism with Ultracold Alkaline-Earth Atoms in Optical Lattices*, Condensed Matter Seminar, Department of Physics & Astronomy, University of California, Irvine, CA, USA, April 2011.
32. *Two-Orbital SU(N) Magnetism with Ultracold Alkaline-Earth Atoms*, APS March Meeting, Dallas, TX, USA, March 2011.
31. *Quantum Information Processing and Quantum Simulation with Ultracold Alkaline-Earth Atoms in Optical Lattices*, Seminar, Center for Macroscopic Quantum Control & Department of Physics and Astronomy, Seoul National University, Seoul, Korea, January 2011.
30. *Quantum Information Processing and Quantum Simulation with Ultracold Alkaline-Earth Atoms in Optical Lattices*, KITP program Beyond Standard Optical Lattices, Kavli Institute for Theoretical Physics, Santa Barbara, CA, USA, November 2010.
29. *Photonic Phase Gate via an Exchange of Fermionic Spin Waves in a Spin Chain*, Informal AMO Theory Seminar, JILA, University of Colorado, Boulder, CO, USA, July 2010.
28. *Photonic Phase Gate via an Exchange of Fermionic Spin Waves in a Spin Chain*, Seminar, College of William & Mary, Williamsburg, VA, USA, June 2010.
27. *Quantum Simulation with Ultracold Alkaline-Earth Atoms in Optical Lattices*, NSF site visit, Institute for Theoretical AMO Physics, Harvard University, Cambridge, MA, USA, May 2010.
26. *Photonic Phase Gate via an Exchange of Fermionic Spin Waves in a Spin Chain*, 10-minute talk, Harvard-MIT Center for Ultracold Atoms, Cambridge, MA, USA, February 2010.
25. *Quantum Information Processing and Quantum Simulation with Ultracold Alkaline-Earth Atoms in Optical Lattices*, Special Condensed Matter Seminar, KITP, Santa Barbara, CA, USA, January 2010.

24. *Quantum Information Processing and Quantum Simulation with Alkaline-Earth Atoms*, IQI Group Meeting, Institute for Quantum Information, California Institute of Technology, Pasadena, CA, USA, January 2010.
23. *Quantum Information Processing and Quantum Simulation with Ultracold Alkaline-Earth Atoms in Optical Lattices*, Seminar, Joint Quantum Institute, NIST, and the University of Maryland, Gaithersburg, MD, USA, December 2009.
22. *Optimal Photon Storage in Atomic Ensembles and Photonic Phase Gate via an Exchange of Fermionic Spin Waves in a Spin Chain*, CQuIC Seminar, Physics Department, University of New Mexico, Albuquerque, NM, USA, December 2009.
21. *Quantum Information Processing and Quantum Simulation with Ultracold Alkaline-Earth Atoms in Optical Lattices*, CQuIC Seminar, Physics Department, University of New Mexico, Albuquerque, NM, USA, December 2009.
20. *Many-body physics (quantum simulation) with ultracold alkaline-earth atoms*, Guest Lecture in *Physics 284: Strongly Correlated Systems in Atomic and Condensed Matter Physics*, Physics Department, Harvard University, Cambridge, MA, USA, October 2009.
19. *Two-Orbital  $SU(N)$  Magnetism with Ultracold Alkaline Earth Atoms*, Wilhelm and Else Heraeus Seminar on Quantum Simulators, Physikzentrum Bad Honnef, Bad Honnef, Germany, October 2009.
18. *Quantum Information Processing and Quantum Simulation with Ultracold Alkaline-Earth Atoms in Optical Lattices*, Advisory Board Meeting, Institute for Theoretical AMO Physics, Harvard University, Cambridge, MA, USA, October 2009.
17. *Quantum Information Processing and Quantum Simulation with Ultracold Alkaline-Earth Atoms in Optical Lattices*, CUA Seminar, Harvard-MIT Center for Ultracold Atoms, Cambridge, MA, USA, September 2009.
16. *Quantum Zeno effect and its application to room-temperature NV-based quantum computing*, Walsworth Group Seminar, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA, September 2009.
15. *Alkaline-Earth Atoms as Few-Qubit Quantum Registers*, Workshop on Ultracold Group II Atoms: Quantum Metrology and Information, Joint Quantum Institute, NIST, and the University of Maryland, College Park, MD, USA, September 2009.
14. *Quantum simulation with ultracold alkaline-earth atoms in optical lattices: two-orbital  $SU(N)$  magnetism*, Seminar, Institute for Quantum Optics and Quantum Information, Innsbruck, Austria, June 2009.
13. *Quantum Information Processing and Quantum Simulation with Ultracold Alkaline-Earth Atoms in Optical Lattices*, Seminar, Max-Planck-Institut für Quantenoptik, Garching, Germany, April 2009.
12. *Quantum Information Processing and Quantum Simulation with Ultracold Alkaline-Earth Atoms in Optical Lattices*, Joint Atomic Physics Colloquium, Institute for Theoretical AMO Physics and Department of Physics, Harvard University, Cambridge, MA, USA, April 2009.

11. *Quantum Information Processing and Two-Orbital  $SU(N)$  Magnetism with Alkaline-Earth Atoms in Optical Lattices*, CMT Kids Seminar, Physics Department, Harvard University, Cambridge, MA, USA, March 2009.
10. *Quantum Simulation with Alkaline-Earth Atoms in Optical Lattices: Two-Orbital  $SU(N)$  Magnetism*, CMT/AMO Seminar, Physics Department, Harvard University, Cambridge, MA, USA, February 2009.
9. *Suppression of Inelastic Collisions between Polar Molecules with a Repulsive Shield and Alkaline-Earth-Like Atoms as Few-Qubit Quantum Registers*, Walsworth Group Seminar, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA, September 2008.
8. *Repulsive Shield Between Polar Molecules*, 10-minute talk, Harvard-MIT Center for Ultracold Atoms, MIT, Cambridge, MA, USA, May 2008.
7. *"Blue Shield" for Polar Molecules*, Seminar, Physics Department, Harvard University, Cambridge, MA, USA, February 2008.
6. *Coherent Quantum Optical Control with Sub-Wavelength Resolution*, Seminar, Physics Department, Stuttgart University, Stuttgart, Germany, December 2007.
5. *Coherent Quantum Optical Control with Sub-Wavelength Resolution*, Seminar, Institute for Quantum Optics and Quantum Information, Innsbruck, Austria, December 2007.
4. *Optimal Control of Photon Storage in Atomic Ensembles*, Princeton-TAMU Symposium on Quantum Coherence and Laser Spectroscopy, Princeton University, Princeton, NJ, USA, March 2007.
3. *Time Reversal as an Experimental Tool for Optimizing Quantum Light-Matter Interfaces*, 10-minute Talk, Harvard-MIT Center for Ultracold Atoms, Cambridge, MA, USA, February 2007.
2. *Optimal Storage of Photon States in Atomic Ensembles*, Advisory Board Meeting, Institute for Theoretical AMO Physics, Cambridge, MA, USA, May 2006.
1. *Optimal Storage of Photon States in Atomic Ensembles*, Seminar, Niels Bohr Institute, Copenhagen, Denmark, March 2006.

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