List of Publications

- Preprints
- Journal Papers
- Contribution to Books and Conference Proceedings
- Talks and Invited Talks

Preprints

[1]. Wei Zhang, G.-D. Lin, L.-M. Duan, Berezinskii-Kosterlitz-Thouless transition in trapped quasi-two-dimensional Fermi gas near a Feshbach resonance, arXiv:0808.0907.

[2]. T. Goodman, L.-M. Duan, Test of Particle-Assisted Tunneling for Strongly Interacting Fermions in an Optical Superlattice, arXiv:0808.2072

[3]. Wei Zhang, G.-D. Lin, L.-M. Duan, BCS-BEC Crossover of a Quasi-two-dimensional Fermi Gas: the Significance of Dressed Molecules, arXiv:0803.2488.

[4]. B. Wang, L.-M. Duan, Possibility of supersolid with repulsive fermions in an anisotropic optical lattice near a Feshbach resonance, arXiv:0707.1302, New Journal of Physics, 2008.

Journal Papers

[5]. L.-M. Duan, General Hubbard model for strongly interacting fermions in an optical lattice and its phase detection, arXiv:0706.2161, **Europhys. Lett.** 81, 20001 (2008).

[6]. G.-D. Lin, Wei Zhang, L.-M. Duan, Characteristics of Bose-Einstein condensation in an optical lattice, arXiv:0802.0700, **Phys. Rev. A** 77, 043626 (2008).

[7]. L.-M. Duan and C. Monroe, Robust Probabilistic Quantum Information Processing with Atoms, Photons, and Atomic ensembles, an invited review article for **Advance of Atomic, Molecular, and Optical Physics** Vol. 55, 419-464 (2007).

[8]. D. L. Moehring, P. Maunz, S. Olmschenk, K. C. Younge, D. N. Matsukevich, L.-M. Duan, and C. Monroe, Entanglement of single-atom quantum bits at a distance, **Nature** 449, 68 - 71 (2007).

[9]. S.-L. Zhu, B. Wang, L. -M. Duan, Simulation and detection of Dirac fermions with cold atoms in an optical lattice, cond-mat/0703454, **Phys. Rev. Lett. 98**, 260402 (2007).

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[11]. W. Yi, G.-D. Lin, L.-M. Duan, Signal of Bose condensation in an optical lattice at finite temperature, arXiv:0705.4352, **Phys. Rev. A (Rapid Communication) 76**, 031602 (2007)

[12]. J. P. Kestner, L.-M. Duan, Level crossing in the three-body problem for strongly interacting fermions in a harmonic trap, arXiv:0706.4123, **Phys. Rev. A 76**, 033611 (2007)

[13]. Wei Zhang, L.-M. Duan, Finite temperature phase diagram of trapped Fermi gases with population imbalance, arXiv:0706.1253, **Phys. Rev. A 76**, 042710 (2007)

[14]. B. Wang, L.-M. Duan, Implementation of controlled SWAP gates for quantum fingerprinting and photonic quantum computation, quant-ph/0610035, **Phys. Rev. A (Rapid Communication) 75**, 050304 (R) (2007).
[15]. L.-M. Duan, Detecting correlation functions of ultracold atoms through Fourier sampling of time-of-flight images, cond-mat/0511678, **Phys. Rev. Lett. 96**, 103201 (2006).
[16]. S.-L. Zhu, H. Fu, C.-J. Wu, S. -C. Zhang, L. -M. Duan, Spin Hall effects for cold atoms in a light induced gauge potential, cond-mat/0607127, **Phys. Rev. Lett.** 97, 240401 (2006).
[17]. S.-L. Zhu, C. Monroe, L.-M. Duan, Trapped ion quantum computation with transverse phonon modes, quant-ph/0601159, **Phys. Rev. Lett.** 97, 050505 (2006).
[18]. T. P. Bodiya, L.-M. Duan, Scalable Generation of Graph-State Entanglement through Realistic Linear Optics, quant-ph/0605058, **Phys. Rev. Lett.** 97, 143601 (2006).
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[21]. Y.-W Wu, X.-Q Li, L.-M. Duan, D. G. Steel, and D. Gammon, Density Matrix Tomography through Sequential Coherent Optical Rotations of an Exciton Qubit in a Single Quantum Dot, **Phys. Rev. Lett.96**, 087402 (2006).
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[23]. W. Yi, L.-M. Duan, Trapped Fermions across a Feshbach resonance with population imbalance, cond-mat/0601006, **Phys. Rev. A (Rapid Communication) 73**, 031604(R) (2006).
[24]. W. Yi, L.-M. Duan, Dynamical mean-field equations for strongly interacting fermionic atoms in a potential trap, cond-mat/0512517, **Europhys. Lett.** 75(6), 854 (2006).
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[27]. Y.-Y. Shi, L.-M. Duan, G. Vidal, Classical Simulation of quantum many-body systems with a tree tensor network, quant-ph/0511070, **Phys. Rev. A** 74, 022320 (2006).
[28]. W. Yi, L.-M. Duan, Phase diagram of a polarized Fermi gas across a Feshbach resonance in a potential trap, cond-mat/0604558, **Phys. Rev. A** 74, 013610 (2006).
[29]. S.-L. Zhu, C. Monroe, L.-M. Duan, Arbitrary-speed quantum gates within large ion crystals through minimum control of laser beams, quant-ph/0508037, **Europhys. Lett.** 73 (4), pp. 1-7 (2006).
[30]. W. Yi, L.-M. Duan, Dynamical Response of Fermi Condensate to Varying Magnetic Fields, cond-mat/0507540, **Phys, Rev. A** 73, 013609 (2006).
[31]. L.-M. Duan, M. J. Madsen, D. L. Moehring, P. Maunz, R. N. Kohn, Jr., and C. Monroe, Probabilistic quantum gates between remote atoms through interference of optical frequency qubits, quant-ph/0603285, **Phys. Rev. A 73**, 062324 (2006).

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[33]. D. L. Moehring, M. J. Madsen, K. Younge, R. N. Kohn, Jr., P., Maunz, L.-M. Duan, and C. Monroe, Quantum Networking with Photons and Trapped Atom, **J. Opt. Soc. Am. B (Special issue)**, (2006).

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Contributions to Books and Proceedings

- P. Zoller, J. I. Cirac, L.-M. Duan, J. J. Garcia-Ripoll, *Quantum optical implementation of quantum information processing*, quant-ph/0405025, Les Houches Quantum Info Lecture Notes (2003).
- L.-M. Duan and H. J. Kimble, A scheme for preparation of multi-atom entanglement by detecting the cavity decay and analysis of its implementation, in Proceedings of the 48th Annual SPIE meeting, vol. 5161, pp 40-47 (2003).
- L.-M. Duan, W. Duer, J. I. Cirac, D. Jaksch, G. Vidal, and P. Zoller, Quantum Computing and Communication with Atoms, Proceedings of the XVIII International Conference on Atomic Physics, pp 273-283 (2002).
- J. I. Cirac, Lu-Ming Duan, and P. Zoller, *Quantum optical implementation of quantum information processing*, quant-ph/0405030, Proceedings of International School of Physics "Enrico Fermi" Courses (2001).

- L.-M. Duan, G. Giedke, J. I. Cirac, P. Zoller, *Inseparability criterion for continuous variable systems*, Quantum Information with Continuous Variables (Ed. by S. Braunstein and A. Pati), pp145-154 (2003).
- L.-M. Duan, W. Duer, J. I. Cirac, D. Jaksch, G. Vidal, and P. Zoller, *Quantum computing and quantum communication with atoms*, Proceedings of the XVIII International Conference on Atomic Physics (Ed. by H. R. Sadeghpour, E. J. Heller, and D. E. Pritchard), pp 273-282 (2003).
- .G. Giedke, L.-M. Duan, J. I. Cirac, P. Zoller, *Distillability and entanglement purification for Gaussian states*, Quantum Information with Continuous Variables (Ed. by S. Braunstein and A. Pati), pp 173-192 (2003).
- L.-M. Duan, J.I. Cirac, P. Zoller, E. S. Polzik, *Quantum communication with atomic ensembles and coherent light*, Quantum Communication, Computing, and Measurement 3, pp. 351-357 (2000).
- L.-M. Duan, G.-C. Guo, *Quantum error correction is applicable for reducing spatially correlated decoherence*, in the proceedings of 1st NASA international conference on Quantum Computing and Quantum Communications: Lecture Notes in Computer Science, Springer-Verlag, pp. 337-340 (1999).
- L.-M. Duan, G.-C. Guo, *A new approach to the phase operator*, in the proceedings of the fifth international conference on Squeezed States and Uncertainty Relations, NASA Corference Publication, p. 209 (1995).

Talks and Invited Talks

- The Ninth International Conference on Quantum Communication, Measurement and Computing (QCMC), Calgary, Canada, August, 2008
- The Canadian Association of Physicists Congress, "Quantum simulation with strongly interacting atoms", Quebec City, June 2008
- DARPA review meeting, "Spin phases for trapped ions", State College, June, 2008.
- DAMOP 2008 Meeting, "Strongly interacting atoms in an optical lattice and its phase detection", State College, Pennsylvania, May, 2008.
- Innsbruck University, "Strong interacting atoms in optical lattices and in low dimensions", Innsbruck, Austria, May, 2008.
- Max-Planck Institute for Quantum Optics, "Strong interacting atoms in optical lattices and in low dimensions", Garching, Germany, April, 2008.
- MURI review meeting, "Strongly interacting fermions in an optical lattice", Newport, Oct. (2007).
- Quantum Information and Many Body Physics Workshop, "Quantum simulation of many-body physics with ultracold atoms", Vancouver, Dec. (2007).
- Harvard-ITAMP workshop on hybrid approach to quantum information processing, invited talk: Hybrid quantum information through probabilistic photon interaction, May (2007).
- Workshop on strongly correlated physics in ultracold atomic gas (ITP, UCSB), invited talk: Quantum simulation with ultracold atomic gas, May (2007).
- MIT-Harvard Center of ultracold atoms, invited seminar: Quantum simulation with ultracold atomic gas, April (2007).

- University of Michigan AMO/CM joint seminar: Quantum simulation and computation with ultracold atoms, Mar. (2007).
- Hong Kong University, invited colloquium, Quantum simulation and computation with cold atoms and ions, Mar. (2007).
- Joint Quantum Institute of Maryland University (college park), invited quantum information seminar, Quantum simulation and computation with cold atoms and ions, Feb. (2007).
- Georgia Tech, invited quantum information colloquium, Quantum simulation and computation with cold atoms and ions, Jan. (2007).
- Perimeter Institute (Canada), invited quantum information seminar, Linear optics quantum information and quantum simulation, Nov. (2006).
- Stanford University, invited condensed matter seminar, Quantum simulation of many-body physics with ultracold atoms, Stanford, Oct. (2006).
- OSA Annual meeting/Laser Science XXII, Invited Talk: Scalable quantum information with realistic linear optics, Rochester, Oct. (2006).
- Penn State University, Invited AMO/condensed-Matt joint seminar: Quantum simulation of many-body physics with ultracold atoms, College State, Oct. (2006).
- Los Alamos National Lab, invited seminar, Probabilistic quantum computation and quantum simulation, June (2006).
- Caltech, invited quantum information science seminar, Quantum simulation of many-body physics with ultracold atoms, Feb. (2006).
- Michigan State University, invited seminar for quantum sciences, Probabilistic computation and simulation with strongly interacting fermions, Feb. (2006).
- University of Texas at Austin, invited AMO/CM joint seminar talk, Many-body physics in ultracold atom systems, Dec. (2005).
- Midwest workshop on ultracold atoms, invited talk: Effective Hamiltonian for fermions in an optical lattice across Feshbach resonance, University of Chicago, Nov. (2005).
- MIT, invited quantum information seminar talk: Probabilistic quantum computation and quantum simulation, Nov. 2005.
- Gordon conference on atomic physics, invited talk: Probabilistic quantum computation and its implementation, Tampa, July 2005.
- DAMOP annual conference, invited talk: Probabilistic quantum computation, Nebraska, May (2005).
- University of Michigan, Mini colloquium: History and perspective of quantum information science, Oct. (2005).
- ARO review meeting for quantum computing, invited talk: Progress on photonic quantum computation with cavity assisted interaction, Florida, Aug. (2005).
- Trapped ion quantum computing workshop, Invited talk: Scaling methods for ion trap quantum computation, Ann Arbor, May. (2004).
- UIUC, invited AMO and quantum information seminar: *Quantum simulation with ultracold atoms*, Nov. (2004).

- Gordon conference on quantum information, Invited talk: *Quantum communication and computation with photons and atoms,* Ventura, Feb. (2004).
- University of Michigan (Ann Arbor), Physics colloquium: *Quantum simulation and quantum computation with a lattice of neutral or charged atoms,* Jan. (2004).
- University of California at Berkeley, invited AMO Seminar: *Quantum communication and computation with photons and atoms,* Berkeley, Nov. (2003).
- The 48th Annual SPIE meeting, Invited talk: *Engineer multi-atom entanglement in a cavity,* San Diego, Aug. (2003).
- ITP (Chinese Academy of Sciences), Colloquium: *Controlled study of strongly correlated many-body physics with ultracold atoms,* Beijing, Mar. (2003).
- University of Oregon, Physics colloquium: *Engineering many-body Hamiltonians with ultracold atoms,* Eugene, Feb. (2003).
- Rice University, Physics colloquium: *From quantum computation to strongly-correlated physics: Engineering many-body Hamiltonians with ultracold atoms,* Houston, Jan. (2003)
- University of Michigan (Ann Arbor), Seminar talk: *Engineer many-body Hamiltonians and multi-particle entanglement through cold or ultracold atoms,* Ann Arbor, Dec. (2002).
- Joint IPAM/MSRI Workshop on Quantum Computing, Invited talk: *Engineering many-body Hamiltonians with ultracold atoms in optical lattices,* UCLA, Oct. (2002).
- The Feynman Festival: Quantum Computing, Invited talk: *Robust quantum communication and state engineering with atomic ensembles,* Mayland University, August (2002).
- The international conference on atomic physics/02, *Many party entanglement of macroscopic atomic ensembles,* MIT, Cambridge, July-August (2002).
- Quantum optics workshop, Invited talk: Q*uantum information processing with atomic ensembles,* Santa Barbara, July (2002).
- IQEC-CLEO/Europe, Invited Talk: *Implementation of long-distance quantum communication,* Moscow, Russia, June (2002).
- Harvard University, Seminar Talk: *Three-dimensional theory for the light-atomic-ensemble interaction,* Cambridge, May (2002)..
- The Southwest Quantum Information and Technology Network (SQUINT), Fourth Annual Meeting, Invited talk: *Long-distance quantum communication with atomic ensembles and linear optics,* NIST (Boulder), Colorado, 8-10 March (2002).
- UC San Diego, Seminar Talk: *Implementation of quantum information processing with atomic ensembles,* San Diego March (2002).
- Caltech, Seminar Talk: *Implementation of quantum repeaters,* Pasadena, Feb. (2002).
- ITAMP in Harvard-Smithsonian Center, Seminar Talk: *Quantum entanglement and Holonomic quantum computation with BEC and with trapped ions,* Boston, USA, Mar. (2001).
- Hong Kong University, Seminar Talk: *Geometric quantum computation and long-distance quantum communication,* Hongkong, Oct. (2001).
- NIST (Gaithersberg), Seminar Talk: *Quantum entanglement in spin-1 condensate and Geometric computation with trapped ions,* Washington, USA, Mar. (2001).

- Trento-Innsbruck joint meeting on Bose-Einstein condensation and Quantum Information, Invited Talk: *Quantum entanglement with Bose-Einstein condensates*, Trento, Italy, Dec. (2000).
- IQEC-CLEO/Europe, Talk:*Storage and processing of quantum light*, Nice, France, Sept. (2000).
- IQEC-CLEO/Europe, Talk:*Continuous variable entanglement purification*, Nice, France, Sept. (2000).
- TMR network meeting: Quantum information, Invited Talk: *Quantum teleportation with atomic ensembles and coherent light*, Vienna, Austria, Sept. 4-6 (2000).
- Fifth International Conference on Quantum Communication, Measurement, and Computing, Invited Talk:*Quantum communication with coherent light and atomic ensembles*, Capri, Italy, July 3-8 (2000).
- Hannover University, Seminar Talk: *Quantum light memory and continuous variable entanglement purification*, Hannover, Germany, Feb. (2000).
- Semilar on Fundamentals of Quantum Optics V, Invited Talk: *Continuous variable entanglement purification and its physical implementation*, Kuehtai, Austria, Jan. 16-21 (2000).
- CLEO/Asia, Invited Talk:*Pulse controlled noise suppressed quantum computation*, South Korea, August (1999).
- First NASA International Conference on Quantum Computing and Quantum Communications, Talk: *Quantum error correction with spatially correlated decoherence*, USA, Feb. (1998).
- Fifth International Conference on Squeezed States and Uncertainty Relations, Talk: *An approach to the phase operator*, Taiyuan, China, July (1995).