

Deborah S. Jin

Updated: 9/14/09

NIST-JILA
University of Colorado
440 UCB
Boulder, CO 80309-0440

Tel. (303) 492-0256
Email: jin@jilau1.colorado.edu

Affiliations

NIST Fellow, Quantum Physics Division
JILA Fellow
Professor Adjoint, Physics Department, University of Colorado, Boulder

Education

The University of Chicago, Ph.D. in Physics, June 1995
Thesis Title: Experimental Study of the Phase Diagrams of Heavy Fermion Superconductors
with Multiple Transitions.
Thesis Advisor: Professor Thomas F. Rosenbaum

Princeton University, A.B. 1990 in Physics, Magna Cum Laude.

Honors

Sigma Xi, The William Proctor Prize for Scientific Achievement, 2009

Benjamin Franklin Medal in Physics, 2008

Fellow of the American Academy of Arts and Sciences, 2007.

Bonfils-Stanton Foundation Award in Science and Medicine, 2006.

American Association for the Advancement of Science, 2006.

Elected to the National Academy of Sciences, 2005.

American Physical Society, I.I. Rabi Prize, 2005.

Scientific American 50: Research Leader of the Year, 2004.

Service to America Medal: Science and the Environment 2004.

Arthur S. Flemming Award (Scientific Category), 2003.

John D. and Catherine T. MacArthur Fellowship, 2003.

Fellow of the American Physical Society, 2003.

National Academy of Sciences Award for Initiatives in Research, 2002.

Maria Goeppert-Mayer Award, 2002.

NIST Samuel W. Stratton Award, 2001.

Presidential Early Career Award for Scientists and Engineers, 2000.

ONR Young Investigator, 1999.

National Research Council Research Associateship - NIST, 1995-1997.

National Science Foundation Graduate Fellowship in Physics, 1990-1993.

Allen Goodrich Shenstone Prize, Princeton University, 1990.

Publications

1. *Uniaxial-Stress Anisotropy of the Double Superconducting Transition in UPt₃*
D. S. Jin, S. A. Carter, B. Ellman, T. F. Rosenbaum, and D. G. Hinks, Phys. Rev. Lett. **68**, 1597 (1992).
2. *Pressure Tuning of the Double Transition in Thoriated UBe₁₃*
R. J. Zieve, D. S. Jin, T. F. Rosenbaum, J. S. Kim, and G. R. Stewart, Phys. Rev. Lett. **72**, 756 (1994).
3. *Low-temperature specific heat of U_{1-x}Th_xBe₁₃*
D. S. Jin, T. F. Rosenbaum, J. S. Kim, and G. R. Stewart, Phys. Rev. B (Rapid Commun.) **49**, 1540 (1994).
4. *H-T phase diagrams of the double transition in thoriated UBe₁₃*
D. S. Jin, S. A. Carter, T. E. Rosenbaum, J. S. Kim, and G. R. Stewart, Phys. Rev. B **53**, 8549 (1996).
5. *Dynamic Signature of the Mott-Hubbard Transition in N(S,Se)₂*
A. Husmann, D. S. Jin, Y. V. Zastavker, T. F. Rosenbaum, X. Yao, and J. M. Honig, Science **274**, 1874, (1996).
6. *Quantitative studies of Bose-Einstein condensation in a dilute atomic vapor*
D. S. Jin, J. R. Ensher, M. R. Matthews, C. E. Wieman, and E. A. Cornell, Proc. of the 21st Intl. Conf. on Low Temp. Phys., Czech. J. Phys. **46** S6, 3070 (1996).
7. *Bose-Einstein condensation in a dilute gas: Measurement of energy and ground-state occupation*
J. R. Ensher, D. S. Jin, M. R. Matthews, C. E. Wieman, and E. A. Cornell, Phys. Rev. Lett. **77**, 4984 (1996).
8. *Collective excitations of a Bose-Einstein condensate in a dilute gas*
D. S. Jin, J. R. Ensher, M. R. Matthews, C. E. Wieman, and E. A. Cornell, Phys. Rev. Lett. **77**, 420 (1996).
9. *Controlled Symmetry Breaking in Superconducting UPt₃*
D. S. Jin, A. Husmann, T. F. Rosenbaum, T. E. Steyer, and K. T. Faber, Phys. Rev. Lett. **78**, 1775 (1997).
10. *Emergence of interaction effects in Bose-Einstein condensation*
M. Holland, D. S. Jin, M.L. Chiofalo, and J. Cooper, Phys. Rev. Lett. **78**, 3801 (1997).

11. *Temperature-Dependent Damping and Frequency Shifts in Collective Excitations of a Dilute Bose-Einstein Condensate*
D. S. Jin, M. R. Matthews, J. R. Ensher, C. E. Wieman, and E. A. Cornell, Phys. Rev. Lett. **78**, 764 (1997).
12. *Dynamical response of a Bose-Einstein condensate to a discontinuous change in internal state*
M. R. Matthews, D. S. Hall, D. S. Jin, J. R. Ensher, C. E. Wieman, E. A. Cornell, F. Dalfovo, C. Minniti, and S. Stringari, Phys. Rev. Lett. **81**, 243 (1998).
13. *Recent experiments with Bose-condensed gases at JILA*
D. S. Hall, J. R. Ensher, D. S. Jin, M. R. Matthews, C. E. Wieman, and E. A. Cornell, in SPIE Proceedings Vol. 3270, 98 (1998).
14. *Exploring a quantum degenerate gas of fermionic atoms*
B. DeMarco and D. S. Jin, Phys. Rev. A **58**, R4267 (1998).
15. *An enriched ^{40}K source for fermionic atoms studies*
B. DeMarco, H. Rohner, and D. S. Jin, Rev. Sci. Instrum. **70**, 1967, (1999).
16. *Measurement of p-wave threshold law using evaporatively cooled fermionic atoms*
B. DeMarco, J. L. Bohn, J. P. Burke, M. Holland, and D. S. Jin, Phys. Rev. Lett. **82**, 4208 (1999).
17. *Onset of Fermi Degeneracy in a Trapped Atomic Gas*
B. DeMarco and D. S. Jin, Science **285**, 1703 (1999).
18. *Evaporative cooling of a two-component degenerate Fermi Gas*
M. J. Holland, B. DeMarco, and D. S. Jin, Phys. Rev. A **61**, 053610 (2000).
19. *Exploring a Quantum Degenerate Fermi Gas*
D. S. Jin, B. DeMarco and S. Papp, Atomic Physics 17, edited by E. Arimondo, P. DeNatalle, and M. Inguscio (AIP 2001).
20. *Pauli Blocking of Collisions in a Quantum Degenerate Atomic Fermi Gas*
B. DeMarco, S. B. Papp, and D. S. Jin, Phys. Rev. Lett. **86**, 5409 (2001).
21. *Transition from Collisionless to Hydrodynamic Behavior in an Ultracold Fermi Gas*
S. D. Gensemer and D. S. Jin, Phys. Rev. Lett. **87**, 173201 (2001).
22. *A two-species magneto-optical trap with ^{40}K and ^{87}Rb*
J. Goldwin, S. B. Papp, B. DeMarco, and D. S. Jin, Phys. Rev. A **65**, 021402 (2002).
23. *Spin Excitations in a Fermi Gas of Atoms*
B. DeMarco and D. S. Jin, Phys. Rev. Lett. **88**, 040405 (2002).
24. *Resonant control of elastic collisions in an optically trapped Fermi gas of atoms*
T. Loftus, C. A. Regal, C. Ticknor, J. L. Bohn, and D. S. Jin, Phys. Rev. Lett. **88**, 173201 (2002).
25. *A Fermi gas of atoms*
D. S. Jin, Physics World **15**, 27 (2002).

26. *Tuning p-wave interactions in an ultracold Fermi gas of atoms*
C. A. Regal, C. Ticknor, J. L. Bohn, and D. S. Jin, Phys. Rev. Lett. **90**, 053201 (2003).
27. *Measurement of positive and negative scattering lengths in a Fermi gas of atoms*
C. A. Regal and D. S. Jin, Phys. Rev. Lett. **90**, 230404 (2003).
28. *Creation of ultracold molecules from a Fermi gas of atoms*
C. A. Regal, C. Ticknor, J. L. Bohn, and D. S. Jin, Nature **424**, 47 (2003).
29. *Emergence of a molecular Bose-Einstein condensate from a Fermi gas*
M. Greiner, C. A. Regal and D. S. Jin, Nature **426**, 537-540 (2003).
30. *Observation of resonance condensation of fermionic atom pairs*
C. A. Regal, M. Greiner and D. S. Jin, Phys. Rev. Lett. **92**, 040403 (2004).
31. *Lifetime of molecule-atom mixtures near a Feshbach resonance in ^{40}K*
C. A. Regal, M. Greiner and D. S. Jin, Phys. Rev. Lett. **92**, 083201 (2004).
32. *Multiplet structure of Feshbach resonances in non-zero partial waves*
C. Ticknor, C. A. Regal, D. S. Jin and J. L. Bohn, Phys. Rev. A **69**, 042712 (2004).
33. *Detection of spatial correlations in an ultracold gas of fermions*
M. Greiner, C. A. Regal, C. Ticknor, J. L. Bohn and D. S. Jin, Phys. Rev. Lett. **92**, 150405 (2004).
34. *Measurement of the interaction strength in a Bose-Fermi mixture with ^{87}Rb and ^{40}K* ,
J. Goldwin, S. Inouye, M. L. Olsen, B. Newman, B. D. DePaola and D. S. Jin, Phys. Rev. A **70**, 021601 (2004).
35. *Observation of heteronuclear Feshbach resonances in a mixture of bosons and fermions*
S. Inouye, J. Goldwin, M. L. Olsen, C. Ticknor, J. L. Bohn and D. S. Jin, Phys. Rev. Lett. **93**, 183201 (2004).
36. *Probing the excitation spectrum of a Fermi gas in the BCS-BEC crossover regime*
M. Greiner, C. A. Regal and D. S. Jin, Phys. Rev. Lett. **94**, 070403 (2005).
37. *Probing pair-correlated fermionic atoms through correlations in atom shot noise*
M. Greiner, C. A. Regal, J. T. Stewart, and D. S. Jin, Phys. Rev. Lett. **94**, 110401 (2005).
38. *Production efficiency of ultra-cold Feshbach molecules in bosonic and fermionic systems*
E. Hodby, S. T. Thompson, C. A. Regal, M. Greiner, A. C. Wilson, D. S. Jin, E. A. Cornell and C. E. Wieman, Phys. Rev. Lett **94**, 120402 (2005).
39. *Cross-dimensional relaxation in Bose-Fermi mixtures*
J. Goldwin. S. Inouye, M. L. Olsen and D. S. Jin, Phys. Rev. A **71**, 043408 (2005).
40. *Fermionic condensates*
M. Greiner, C. A. Regal and D. S. Jin, in Atomic Physics 19: XIX International Conference on Atomic Physics, **770** (2005).
41. *Momentum distribution of a Fermi gas of atoms in the BCS-BEC crossover*
C. A. Regal, M. Greiner, S. Giorgini, M. Holland, and D. S. Jin, Phys. Rev. Lett. **95**, 250404 (2006).

42. *Understanding the superfluid phase diagram in trapped Fermi gases*
Q. Chen, C. A. Regal, M. Greiner, D. S. Jin, and K. Levin, Phys. Rev. A **73**, 041601 (2006).
43. *Finite- temperature momentum distribution of a trapped Fermi gas*
Q. Chen, C. A. Regal, D. S. Jin, and K. Levin, Phys. Rev. A (Rapid Commun.) **74**, 011601(R) (2006).
44. *Experimental realization of the BCS-BEC crossover with a Fermi gas of atoms*
C. A. Regal and D. S. Jin, Adv. Atom. Mol. Opt. Phys **54**, 1-79 (2007).
45. *The potential energy of a ^{40}K Fermi gas in the BCS-BEC crossover*
J. T. Stewart, J. P. Gaebler, C. A. Regal, and D. S. Jin, Phys. Rev. Lett. **97**, 220406 (2006).
46. *Fermi gas experiments*
D. S. Jin and C. A. Regal, in Proceedings, International School of Physics "Enrico Fermi" course CLXIV (IOS Press, Amsterdam, 2008).
47. *p-wave Feshbach molecules*
J. P. Gaebler, J. T. Stewart, J. L. Bohn, and D. S. Jin, Phys. Rev. Lett. **98**, 200403 (2007).
48. *Ultracold dense gas of deeply bound heteronuclear molecules*
S. Ospelkaus, A. Pe'er, K.-K. Ni, J. J. Zirbel, B. Neyenhuis, S. Kotochigova, P. S. Julienne, J. Ye, and D. S. Jin, Nature Phys. **4**, 622 (2008).
49. *Collisional stability of fermionic Feshbach molecules*
J. J. Zirbel, K.-K. Ni, S. Ospelkaus, J. P. D'Incao, C. E. Wieman, J. Ye, and D. S. Jin, Phys. Rev. Lett, **100**, 143201 (2008).
50. *Heteronuclear molecules in an optical dipole trap*
J. J. Zirbel, K.-K. Ni, S. Ospelkaus, T. L. Nicholson, M. L. Olsen, C. E. Wieman, J. Ye, D. S. Jin and P.S. Julienne, Phys. Rev. A **78**, 013416, (2008).
51. *An atomic Fermi gas near a p-wave Feshbach resonance*
D. S. Jin, J. P. Gaebler, and J. T. Stewart, Proceedings of the International Conference on Laser Spectroscopy 2007, Telluride, Colorado, ed. L. Hollberg, J. Bergquist and M. Kasevich, Telluride, Colorado, (World Scientific, 2008).
52. *Using photoemission spectroscopy to probe a strongly interacting Fermi gas*
J. T. Stewart, J. P. Gaebler, and D. S. Jin, Nature **454**, 744 (2008).
53. *Bragg spectroscopy of a strongly interacting ^{85}Rb Bose-Einstein condensate*
S. B. Papp, J. M. Pino, R. J. Wild, S. Ronen, C. E. Wieman, D. S. Jin, and E. A. Cornell, Phys Rev Lett. **101**, 135301 (2008).
54. *A High Phase-Space-Density Gas of Polar Molecules*

K.-K. Ni, S. Ospelkaus, M. H. G. de Miranda, A. Pe'er, B. Neyenhuis, J. J. Zirbel, S. Kotochigova, P. S. Julienne, D. S. Jin, J. Ye, *Science* **322**, 231 (2008) DOI: 10.1126/science.1163861.

55. *Photoemission Spectroscopy for Ultracold Atoms*

D. S. Jin, J. T. Stewart and J. P. Gaebler, submitted to the 2008 Proceedings of the International Conference on Atomic Physics, Storrs, CT

56. *When is a Quantum Gas a Quantum Liquid?*

J. M. Pino, R. J. Wild, S. B. Papp, S. Ronen, D. S. Jin, and E. A. Cornell, submitted to the 2008 Proceedings of the International Conference on Atomic Physics, Storrs, CT

57. *Coherent Atom-Molecule Oscillations in a Bose-Fermi Mixture*

M. L. Olsen, J. D. Perreault, T. D. Cumby, and D. S. Jin, *Phys Rev A*, **80**, 030701R, 2009.

58. *Ultracold polar molecules near quantum degeneracy*

S. Ospelkaus, K.-K. Ni, M. H. G. de Miranda, B. Neyenhuis, D. Wang, S. Kotochigova, P. S. Julienne, D. S. Jin, and J. Ye," *Faraday Discussions*, Royal Society of Chemistry, UK, **142**, 351 - 359, 2009.

59. *A Dipolar Gas of Quantum Molecules*

K-K Ni, S. Ospelkaus, J. Ye and D.S. Jin, *Phys Chem Chem Phys*, DOI: 10.1039/b911779b, 2009.

60. *Controlling the hyperfine state of rovibronic ground-state polar molecules*

S. Ospelkaus, K-K Ni, G. Quemener, B. Neyenhuis, D. Wang, M.H.G. deMiranda, J.L. Bohn, J. Ye and D.S. Jin, arXiv:0908.3931, August 2009.