

Curriculum Vitae

Boris B. Blinov

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Education *Ph.D. in Physics*, University of Michigan, 2000
M.S. in Physics, Moscow State University, 1995

Research area Quantum information and computation, ion trapping, atomic physics

Research experience

09/2005 - present University of Washington, Department of Physics,
Assistant Professor

06/2001 - 08/2005 FOCUS Center, Department of Physics, University of Michigan
Postdoctoral Research Fellow

06/2000 - 05/2001 Spin Physics Center, Department of Physics, University of Michigan
Postdoctoral Research Fellow

01/1996 - 05/2000 Spin Physics Center, Department of Physics, University of Michigan
Graduate Student Research Assistant

09/1993 - 08/1994 Spin Physics group, Department of Physics, University of Michigan
Visiting Research Investigator

Memberships

1994 - present Member, American Physical Society
2003 - present Associate Member, Michigan Center for Theoretical Physics

Awards and honors

Faculty Excellence in Undergraduate Teaching Award (University of Washington Department of Physics, 2008).
Nominated by the University of Washington for the Packard Foundation Fellowship for Science and Engineering (2007).
Finalist, Young Scholar Competition at “*Amazing Light*” Symposium (Berkeley, CA 2005).

Invited presentations

2007 May	Northwest Section of American Physical Society annual meeting (Pocatello, ID)
2006 November	Frontiers in Quantum and Biological Information Processing Workshop (Orlando, FL)
2006 October	New Laser Scientist Conference (Rochester, NY)
2005 October	Amazing Light: Vision for Discovery Symposium (Berkeley, CA)
2005 June	Cross Border Workshop (Columbus, OH)
2005 March	Gordon Conference on Quantum Information Science (Ventura, CA)
2004 July	International Technology Roadmap for Semiconductors Architectures Workshop (San Francisco, CA)
2004 May	Division of Atomic, Molecular and Optical Physics (Tucson, AZ)
2003 August	Quantum Enabled Science and Technology (Santa Fe, NM)
2003 June	Quantum Electronics and Laser Science (Baltimore, MD)
2003 May	Simons Conference on Quantum and Reversible Computation (Stony Brook, NY)
2002 October	Optical Society of America Annual Meeting (Orlando, FL)
2002 August	FOCUS Kickoff Conference (Ann Arbor, MI)

Colloquia and Seminars

2008 March	Physics Colloquium (University of British Columbia, Vancouver, BC)
2007 April	Physics Colloquium (Washington State University, Pullman, WA)
2006 June	Quantum Information Seminar (Sandia National Labs, Albuquerque, NM)
2006 April	AMO Seminar (Oregon Center for Optics, U. of Oregon, Eugene, OR)
2005 November	CM Seminar (University of Washington, Seattle, WA)
2005 July	AMO Seminar (GA Tech, Atlanta, GA)
2005 March	Physics Colloquium (University of Nebraska, Lincoln, NE)
2005 March	AMO Seminar (University of New Mexico, Albuquerque, NM)
2005 February	CM Seminar (MIT, Boston, MA)
2005 January	Physics Colloquium (University of Washington, Seattle, WA)
2005 January	AMO Seminar (University of Wisconsin, Madison, WI)
2004 November	AMO Seminar (University of Delaware, Newark, DE)
2004 September	Quantum Information Science Seminar (University of Illinois, Urbana, IL)
2004 March	Applied Physics Seminar (University of Michigan, Ann Arbor, MI)
2004 March	AMO Seminar (SUNY, Stony Brook, NY)
2004 January	Spin Physics seminar (University of Michigan, Ann Arbor, MI)

Popular accounts of research covered by: Journal of Engineering and Technology, Nature, New Scientist, Optics and Photonics News, Photonics Spectra, Physics Today, Physics World, Science News, Technology Review, and Wired.

Publications

Refereed journals (over 600 citations)

2008

24. "Precision measurement of the branching ratio in the $6P_{3/2}$ decay of Ba^{+} with a single trapped ion", N. Kurz, M. R. Dietrich, Gang Shu, R. Bowler, J. Salacka, V. Mirgon, and B. B. Blinov, Phys. Rev. **A 77** 060501(R) (2008).

23. "Nuclear magnetic octupole moment and the hyperfine structure of the $5D_{3/2,5/2}$ states of the Ba^{+} ion", K. Beloy, A. Derevianko, V. A. Dzuba, G. T. Howell, B. B. Blinov and E. N. Fortson, Phys Rev **A 77**, 052503 (2008).

2007

22. "Quantum Networking with Photons and Trapped Atoms", D.L. Moehring, M.J. Madsen, K. Younge, R.N. Kohn Jr., P. Maunz, L.-M. Duan, C. Monroe, and B.B. Blinov, J. Opt. Soc. Am. **B 24**, 300 (2007).

2006

21. "Efficient Photoionization-Loading of Trapped Cadmium Ions with Ultrafast Pulses", L. Deslauriers, M. Acton, B. B. Blinov, K.-A. Brickman, P. C. Haljan, W. K. Hensinger, D. Hucul, S. Katnik, R. N. Kohn Jr., P. J. Lee, M. J. Madsen, P. Maunz, S. Olmschenk, D. L. Moehring, D. Stick, J. Sterk, M. Yeo, K. C. Younge, and C. Monroe, Phys. Rev. **A 74**, 063421 (2006).

20. "Broadband laser cooling of trapped atoms with ultrafast pulses", B. B. Blinov, R. N. Kohn Jr., M. J. Madsen, P. Maunz, D. L. Moehring, and C. Monroe, J. Opt. Soc. Am. **B 23**, 1170 (2006).

19. "Precision lifetime measurements of a single trapped ion with ultrafast laser pulses", D. L. Moehring, B. B. Blinov, D. W. Gidley, R. N. Kohn Jr., M. J. Madsen, T. D. Sanderson, R. S. Vallery, and C. Monroe, Phys. Rev. **A 73**, 023413 (2006).

2003 - 2005

18. "Experimental Bell Inequality Violation with an Atom and a Photon", D.L. Moehring, M. J. Madsen, B.B. Blinov, and C. Monroe, Phys. Rev. Lett. **93**, 090410 (2004).

17. "Zero-Point cooling and low heating of trapped $^{111}\text{Cd}^{+}$ ions", L. Deslauriers, P. C. Haljan, P. J. Lee, K.-A. Brickman, B. B. Blinov, M. J. Madsen, C. Monroe, Phys. Rev. **A 70** 043408 (2004).

16. "Quantum Computing with Trapped Ion Hyperfine Qubits", B. B. Blinov, D. Leibfried, C. Monroe, and D. J. Wineland, Quant. Inf. Proc. **3**, 45 (2004).

15. "Scalable Trapped Ion Quantum Computation with a Probabilistic Ion-Photon Mapping", L.-M. Duan, B.B. Blinov, D.L. Moehring, C. Monroe, Quant. Inf. Comp. **4**, 165 (2004) (e-print arXiv quant-ph/0401020).

14. "Observation of entanglement between a single trapped atom and a single photon", B.B. Blinov, D.L. Moehring, L.-M. Duan and C. Monroe, Nature **428**, 153 (2004).

13. "Atomic Qubit Manipulation with an Electro-Optic Modulator", P.J. Lee, B.B. Blinov, K. Brickman, L. Deslauriers, M.J. Madsen, R. Miller, D.L. Moehring, D. Stick, and C. Monroe, Optics Letters **28**, 1582 (2003).

2000 - 2002

12. "*Sympathetic Cooling of Trapped Cd⁺ Isotopes*", B.B. Blinov, L. Deslauriers, P. Lee, M.J. Madsen, R. Miller, and C. Monroe, Phys. Rev. **A 65**, 040304(R) (2002).
11. "*99.6% Spin-Flip Efficiency in the Presence of a Strong Siberian Snake*", B. B. Blinov, Z. B. Etienne, A. D. Krisch, M. A. Leonova, W. Lorenzon, V. S. Morozov, C. C. Peters, V. K. Wong, K. Yonehara, V. A. Anferov, P. Schwandt, E. J. Stephenson, B. von Przewoski, and H. Sato, Phys. Rev. Lett. **88**, 014801 (2002).
10. "*Spin-flipping polarized electrons*", V. S. Morozov, V. A. Anferov, B. B. Blinov, A. D. Krisch, W. Lorenzon, C. C. Peters, K. Yonehara, M. Farkhonden, W. A. Franklin, K. D. Jacobs, H. Kolster, S. Sirca, T. Smith, E. Tsentalovich, J. Viereg, G. T. Zwart, and E. Six, Phys. Rev. ST Accel. Beams **4**, 104002 (2001).
9. "*Spin-flipping with an rf-dipole and a full Siberian snake*", B.B. Blinov, Ya.S. Derbenev, T. Kageya, D.Yu. Kantsyrev, A.D. Krisch, V.S. Morozov, D.W. Sivers, V.K. Wong, V.A. Anferov, P. Schwandt, and B. von Przewoski, Phys. Rev. ST Accel. Beams **3**, 104001(2000).
8. "*Spin flipping a stored polarized proton beam with an rf dipole*", V.A. Anferov, B.B. Blinov, D.Yu. Kantsyrev, A.D. Krisch, D.W. Sivers, C.M. Chu, P. Schwandt, B. von Przewoski, and V.N. Grishin, Phys. Rev. ST Accel. Beams **3**, 041001 (2000).

1994 - 1999

7. "*Synchrotron-sideband snake depolarizing resonance*", B.B. Blinov, V.A. Anferov, Ya.S. Derbenev, T. Kageya, A.D. Krisch, W. Lorenzon, D.W. Sivers, K.V. Sourkont, V.K. Wong, S.S. Youssof, C.M. Chu, S.Y. Lee, T. Rinckel, P. Schwandt, F. Sperisen, B. von Przewoski, and H. Sato, Rev. ST Accel. Beams **2**, 064001 (1999).
6. "*Unexpectedly wide rf-induced synchrotron sideband depolarizing resonances*", C.M. Chu, T.J.P. Ellison, S.Y. Lee, T. Rinckel, P. Schwandt, F. Sperisen, B. von Przewoski, V.A. Anferov, B.B. Blinov, M.A. Bychkov, D.D. Caussyn, E.D. Courant, D.A. Crandell, Ya.S. Derbenev, W.A. Kaufman, A.D. Krisch, W. Lorenzon, T.S. Nurushev, R.A. Phelps, L.G. Ratner, V.K. Wong, C. Ohmori, M.G. Minty, P.S. Martin, A.D. Russell, and D.W. Sivers, Phys. Rev. **E 58**, 4973 (1998).
5. "*Spin Flipping in the Presence of a Full Siberian Snake*", B.B. Blinov, V.A. Anferov, Ya.S. Derbenev, T. Kageya, A.D. Krisch, W. Lorenzon, L.G. Ratner, D.W. Sivers, K.V. Sourkont, V.K. Wong, C.M. Chu, S.Y. Lee, T. Rinckel, P. Schwandt, F. Sperisen, B. von Przewoski, and H. Sato, Phys. Rev. Lett. **81**, 2906 (1998).
4. "*First observation of a snake depolarizing resonance*", R.A. Phelps, V.A. Anferov, B.B. Blinov, D.A. Crandell, S.V. Koutin, A.D. Krisch, T.J. Liu, L.G. Ratner, V.K. Wong, C.M. Chu, S.Y. Lee, T. Rinckel, P. Schwandt, F. Sperisen, E.J. Stephenson, B. von Przewoski and H. Sato, Phys. Rev. Lett. **78**, 2772 (1997).
3. "*Spin flipping through an intrinsic depolarizing resonance by strengthening it*", D.A. Crandell, V.A. Anferov, B.B. Blinov, D.D. Caussyn, Ya.S. Derbenev, S-Q. Hu, S.V. Koutin, A.D. Krisch, T.J. Liu, R.A. Phelps, L.G. Ratner, V.K. Wong, C.M. Chu, S.Y. Lee, T. Rinckel, P. Schwandt, F. Sperisen, E.J. Stephenson, B. von Przewoski and M. Berglund, Phys. Rev. Lett. **77**, 1763 (1996).
2. "*Spin flipping a stored polarized proton beam*", D.D. Caussyn, Ya.S. Derbenev, T.J.P. Ellison, S.Y. Lee, T. Rinckel, P. Schwandt, F. Sperisen, E.J. Stephenson, B. von Przewoski, B.B. Blinov, C.M. Chu, E.D. Courant, D.A. Crandell, W.A. Kaufman, A.D. Krisch, T.S. Nurushev, R.A. Phelps, L.G. Ratner, V.K. Wong and C. Ohmori, Phys. Rev. Lett. **73**, 2857 (1994).

1. "First test of a partial Siberian snake during polarized beam acceleration", B.B. Blinov, C.M. Chu, E.D. Courant, D.A. Crandell, W.A. Kaufman, A.D. Krisch, T.S. Nurushev, R.A. Phelps, D.B. Raczkowski, L.G. Ratner, V.K. Wong, D.D. Caussyn, Ya.S. Derbenev, T.J.P. Ellison, S.Y. Lee, T. Rinckel, P. Schwandt, F. Sperisen, E.J. Stephenson, B. von Przewoski, R. Baiod, M.G. Minty, C. Ohmori, and U. Wienands, Phys. Rev. Lett. **73**, 1621 (1994).

Conference proceedings

12. "Ion Trap Networking: Cold, Fast, and Small", D. L. Moehring, M. Acton, B. B. Blinov, K.-A. Brickman, L. Deslauriers, P. C. Haljan, W. K. Hensinger, D. Hucul, R. N. Kohn, P. J. Lee, M. J. Madsen, P. Maunz, S. Olmschenk, D. Stick, M. Yeo, C. Monroe, and J. Rabchuk, **Laser Spectroscopy XVII**, E. A. Hinds, A. Ferguson, and E. Riis, (eds.), World Scientific, Singapore 2005, pp. 421-428.

11. "99.9% Spin-Flip Efficiency in the Presence of a Strong Siberian Snake", V. S. Morozov, B. B. Blinov, Z. B. Etienne, A. D. Krisch, M. A. Leonova, A. M. T. Lin, W. Lorenzon, C. C. Peters, D. W. Sivers, V. K. Wong, K. Yonehara, V. A. Anferov, P. Schwandt, E. J. Stephenson, B. von Przewoski, and H. Sato, AIP Conf. Proc. **675**(1) 776 (2003).

10. "Siberian Snakes and Spin-flipping in Storage Rings", B.B. Blinov, 2nd Workshop on Physics with an Electron Polarized Light-Ion Collider, AIP Conf. Proc. **588**(1) 355 (2001).

9. "Spin-flipping with an rf-dipole and a full Siberian snake", A. M. T. Lin, B. B. Blinov, Ya. S. Derbenev, T. Kageya, D. Yu. Kantsyrev, A. D. Krisch, V. S. Morozov, J. R. Murray, D. W. Sivers, V. K. Wong, K. Yonehara, V. A. Anferov, C. M. Chu, P. Schwandt, B. von Przewoski, V. N. Grishin, V. L. Solovianov, K. Jacobs, and G. T. Zwart, AIP Conf. Proc. **570**(1) 736 (2001).

8. "Synchrotron-sideband snake depolarizing resonances", T. Kageya, V. Anferov, B. Blinov, C. Chu, Ya. Derbenev, A. Krisch, S. Lee, W. Lorenzon, T. Rinckel, H. Sato, P. Schwandt, D. Sivers, K. Sourkont, F. Sperisen, B. vonPrzewoski, V. Wong, and S. Youssof, AIP Conf. Proc. **570**, 893 (2001).

7. "Michigan ultra-cold polarized atomic hydrogen jet target", B. B. Blinov, S. E. Gladysheva, T. Kageya, D. Yu. Kantsyrev, A. D. Krisch, V. G. Luppov, V. S. Morozov, J. R. Murray, R. S. Raymond, N. Borisov, V. Fimushkin, V. Grishin, A. Mysnik, and D. Kleppner, AIP Conf. Proc. **570** 856 (2001).

6. "Spin-Flipping a Stored Polarized Proton Beam with an rf Dipole", B.B. Blinov, Ya.S. Derbenev, T. Kageya, D.Yu. Kantsyrev, A.D. Krisch, V.S. Morozov, D.W. Sivers, V.K. Wong, V.A. Anferov, P. Schwandt, and B. von Przewoski, 7th Conference on Intersections of Particle and Nuclear Physics, AIP Conf. Proc. **549**(1) 662 (2000).

5. "Polarized atomic hydrogen beam studies in the Michigan ultra-cold jet", R. S. Raymond, B. B. Blinov, N. S. Borisov, J. Cheng, A. M. Davidenko, V. V. Fimushkin, S. E. Gladysheva, V. N. Grishin, T. Kageya, D. Yu. Kantsyrev, D. Kleppner, A. D. Krisch, V. G. Luppov, V. S. Morozov, J. R. Murray, J. J. Neumann, and B. Yankama, AIP Conf. Proc. **549**(1) 674 (2000).

4. "Ultra-cold methods for polarized atomic hydrogen", V. G. Luppov, J. D. Arnold, B. B. Blinov, M. A. Bychkov, S. E. Gladysheva, A. D. Krisch, A. M. T. Lin, R. S. Raymond, V. V. Fimushkin, V. V. Mochalov, and P. A. Semenov, AIP Conf. Proc. **421**, 119 (1998).

3. "First test of a partial Siberian snake for acceleration of polarized protons", D. D. Caussyn, R. Baiod, B. B. Blinov, C. M. Chu, E. D. Courant, D. A. Crandell, Ya. S. Derbenev, T. J. P. Ellison, W.

A. Kaufman, A. D. Krisch, S. Y. Lee, M. G. Minty, T. S. Nurushev, C. Ohmori, R. A. Phelps, D. B. Raczkowski, L. G. Ratner, P. Schwandt, E. J. Stephenson, F. Sperisen, B. von Przewoski, U. Wienands, and V. K. Wong, AIP Conf. Proc. 343, 85 (1995).

2. *"Spin flipping a stored vertically polarized proton beam with an RF solenoid"*, R.A. Phelps, B.B. Blinov, C. M. Chu, E.D. Courant, D.A. Crandell, W.A. Kaufman, A.D. Krisch, T.S. Nurushev, L.G. Ratner, V.K. Wong, D.D. Caussyn, Ya.S. Derbenev, T.J.P. Ellison, S.Y. Lee, T. Rinckel, P. Schwandt, F. Sperisen, E. J. Stephenson, B. von Przewoski, and C. Ohmori, AIP Conf. Proc. 343, 118 (1995).

1. *"Status on the Michigan-MIT ultra-cold polarized hydrogen jet target"*, V. G. Luppov, B. B. Blinov, J. A. Bywater, S. Chin, V. V. Churakov, G. R. Court, W. A. Kaufman, D. Kleppner, A. D. Krisch, Yu. M. Melnik, J. B. Muldavin, T. S. Nurushev, J. S. Price, A. F. Prudkoglyad, R. S. Raymond, V. B. Shutov, and J. A. Stewart, AIP Conf. Proc. 339, 698 (1995).

Student Advisees

Graduate Students

Michelle Brochman (2008 -)
Adam Kleczewski, U of Washington (2006 -)
Matthew Dietrich, U of Washington (2006 -)
Gary Howell, U of Washington (2006 -)
Gang (Rick) Shu, U. of Washington (2005 -)
Nathan Kutz, U of Washington (2005 -)
Li Wang, U of Washington (2006 - 2007)

Undergraduate Students

Edan Shahar, U. of Washington (2008 -)
Frank Garcia, U. of Washington (2008 -)
Aaron Avril, U. of Washington (2008 -)
Peter Greene, U. of Washington (2008)
Sanghoon Chong, U. of Washington (2007 -)
Phil Nelsen, U. of Washington (2007)
Joseph Pirtle, U. of Washington (2007 - 2008)
Nathan Pegram, U. of Washington (2007 - 2008)
Ryan Bowler, U. of Washington (2006 - 2008)
Viki Mirgon, U. of Washington (2006 - 2008)
Joanna Salacka, U. of Washington (2006 - 2008)