

Curriculum Vitae

May 8, 2003

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Personal:

Born March 29, 1955 in Raleigh, North Carolina. Married in 1979 to Susan Foster Isbey, MD. Three sons, Patrick O'Dowd Brown, b. 1987; William Brinkman Brown, b. 1990; and Samuel Gibbins Brown, b. 1995. Lives in Durham, N.C.

Education:

- B.S. from Duke University, 1977; Magna Cum Laude, four years on the Dean's list with class honors. Majors were Physics and Philosophy, with a minor interest (eight course credits, four at the graduate level) in Mathematics.
- PhD. from Duke University, 1982 in Theoretical and Mathematical Physics (see dissertation title below).

Membership:

American Physical Society, Usenix.

Employment:

- Undergraduate Research Assistant for Triangle Universities Nuclear Laboratory (TUNL), 1977.
- Teaching Assistant, Duke University, 1977–1979.
- Instructor/Research Associate, Duke University, 1982–1988.
- Visiting Assistant Professor, Duke University, 1989–2001
- Visiting Professor, Duke University, 2001-2002
- Senior Systems Programmer, Duke University, 1987-present.

Teaching Experience:

1982-present: undergraduate introductory physics, undergraduate quantum theory, graduate classical electrodynamics, and graduate mathematical methods of physics. In addition Brown has taught two independent study courses in computer science and programming and sponsored a PRUV fellowship student studying genetic algorithms. Brown has also been a pre-major advisor for the Trinity School of Arts and Sciences since 1995.

Publications and Conferences:

1. “Multiple scattering and non–muffin–tin band theory”, presented at the Southeastern Sectional meeting of the American Physical Society, November, 1980.
2. “The position space Green’s function and its application to a non–muffin–tin band theory”. Ph.D. dissertation; June 1982.
3. “Generalized non–muffin–tin band theory,” R. G. Brown and M. Ciftan, *Phys. Rev.* **B27**, 4564 (1983).
4. “Stress activated Raman scattering and microcrack detection”, M. Ciftan, R. G. Brown, and E. Saibel, *Int J. Eng. Sci* **21**, 128 (1983).
5. “A numerical application of a generalized non–muffin–tin band theory”, Poster presented at Sanibel Quantum Chemistry Symposium, March, 1984.
6. “A generalized non–muffin–tin theory of band structure”, R. G. Brown and M. Ciftan, *Int. J. Quan. Chem.: QCS* **18** ed. P. O.

- Lowdin, J. R. Sabin, M. C. Zerner. Wiley and Sons, New York, 1984.
7. “A generalized theory of band structure”, R. G. Brown and M. Ciftan, *Phys. Rev.* **B32**, 1339 (1985).
 8. “Numerical tests of high–precision multiple–scattering band theory”, R. G. Brown and M. Ciftan, *Phys. Rev.* **B33**, 7937 (1986).
 9. “Convergence properties of an exact band theory”, R. G. Brown and M. Ciftan, *Condensed Matter Theories* **1**, ed. F. B. Malik, Plenum, New York, 1986.
 10. “Pseudospin–ordered optical bistability for two–level atoms”, presented at the meeting of the Southeastern Section of the American Physical Society in Williamsburg, VA, November 1986.
 11. “Local dynamics, correlation, and phase transitions: N–body versus nonlinear quantum optics”, R. G. Brown and M. Ciftan *Condensed Matter Theories* **3**, ed. J. S. Arponen, R. F. Bishop and M. Manninen, Plenum, New York, 1988.
 12. “Generalized non–muffin–tin multiple scattering theory”, R. G. Brown, *J. Phys.* **B21** (letter), L309 (1988).
 13. “Multipolar integral equation theory and generalized multiple scattering theory”, , R. G. Brown and M. Ciftan *Condensed Matter Theories* **4**, ed. J. H. Keller, Plenum, New York, 1989.
 14. “Multipolar expansions in the empty lattice problem”, R. G. Brown and M. Ciftan, *Phys. Rev.* **B39**, 3543 (1989).
 15. Comment on “Energy band equations for a general periodic potential”, R. G. Brown and M. Ciftan, *Phys. Rev.* **B39**, 10415 (1989).
 16. “The N–atom optical Bloch equations: A microscopic theory of quantum optics”, R. G. Brown and M. Ciftan, *Phys. Rev.* **A40**, 3080 (1989).
 17. “An elementary integral of Bessel functions”, A. Kenan Ciftci, R. G. Brown and M. Ciftan, *Phys. Rev.* **B41**, 3242 (1990).
 18. “Quantum Statistical Microdynamics and critical phenomena”, R. G. Brown and M. Ciftan, *Condensed Matter Theories* **6**, ed. S. Fontoni and S. Rosati, Plenum, New York, 1991.

19. “Ferromagnetism in two dimensions”, presented at the 1991 South-eastern Sectional meeting of the American Physical Society in Durham, NC.
20. “Multipolar Expansions for Multiple Scattering Theory”, presented at the 1991 Materials Research Society Fall Symposium (session V) in Boston, MA; published in the symposium proceedings.
21. “The 2d/3D classical Heisenberg ferromagnet”, presented at the March, 1992 Simulation Methods Workshop at the Center for Simulational Studies in Athens, GA; published in the workshop proceedings. (Springer-Verlag).
22. “The Dynamic Critical Exponents of the 3d, $\mathcal{O}(3)$ Classical Heisenberg Model”, R. G. Brown and M. Ciftan, *Condensed Matter Theories* **10**, ed. Artur Polls, Nova Science Publishers, (1996).
23. “A high-precision evaluation of the static exponents of the classical Heisenberg ferromagnet”, R. G. Brown and M. Ciftan, *Phys. Rev. Lett.* **76** 1352 (1996).
24. “The critical exponents of the classical Heisenberg ferromagnet”, talk presented by R. G. Brown at the 1996 APS meeting, St. Louis, Missouri.
25. “Critical exponents of the classical Heisenberg model: Comment and Reply”, R. G. Brown and M. Ciftan, *Phys. Rev. Lett.* **78** 2265 (1997)
26. “Critical scaling of the dynamic critical exponents of the classical Heisenberg ferromagnet”, R. G. Brown and M. Ciftan, *Phys. Rev. B* **54** 15860 (1996).
27. “Critical Exponents of the Classical Heisenberg Model”, R. G. Brown and M. Ciftan, p. 345 of *Condensed Matter Theories* **12**, ed. John. W. Clark and P. V. Panat, Nova Science Publishers, New York, 1997.
28. “Monte Carlo study of the helicity modulus of the classical Heisenberg ferromagnet”, R. G. Brown and M. Ciftan, to appear in *Condensed Matter Theories* **13** (1998, part I) and *Condensed Matter Theories* **14** (1999, part II) in press.

Web Publications: Many of the following publications (and related modifications) are available at:

<http://www.phy.duke.edu/brahma/Resources/resources.php>

or

<http://www.phy.duke.edu/~rgb/Beowulf/beowulf.php>

1. "The Beowulf Design", tutorial presented at 1999 Linux Expo in Raleigh, NC.
2. "Introduction to the Beowulf Design", tutorial presented at Glaxo-Wellcome in the Research Triangle Park, March 27, 2000.
3. "Introduction to the Beowulf Design", a much more elementary tutorial presented to the 2000 Techno-Security Workshop held in North Myrtle Beach, SC from April 17-19, 2000.
4. "Engineering a Beowulf-Style Compute Cluster", R. G. Brown, online Gnu Open Publication License book provided to the beowulf community at:
http://www.phy.duke.edu/brahma/Resources/beowulf_book.php
5. "Maximizing Beowulf Performance", R. G. Brown, invited paper presented at the Extreme Linux track of the Atlanta Linux Showcase and Conference, October 2000, available online at:
http://www.usenix.org/publications/library/proceedings-als2000/full_papers/brownrobert/
6. "Eden, A Home Beowulf", R. G. Brown, in *login: The Magazine of Usenix and Sage*, Aug. 2001, Vol. 26, No. 5., available online at: <http://www.usenix.org/publications/login-2001-08/pdfs/brown.pdf>
7. "The Critical Scaling of the Helicity Modulus of the O(3) Classical Heisenberg Ferromagnet", a research progress report presented to the Duke High Performance Computing Group on April 7, 2003.

Manuscripts being prepared:

1. "Finite size scaling of the helicity modulus of the classical Heisenberg ferromagnet", R. G. Brown and M. Ciftan (submitted to *Physical Review Letters*, being revised with more computation).

Current Support:

R. G. Brown is currently co-PI on U. S. Army Research Office grant No. 313-1191, 1/22/01-4/21/03.

Other Accomplishments:

1. Systems engineer who designed (circa 1995) and has subsequently been building, upgrading, and redesigning the beowulf-class distributed parallel supercomputer cluster *Brahma* in the Duke University physics department. Parts of this system have been funded by the University, by the Army Research Office, by the Department of Energy, by the National Science Foundation, and by an Intel equipment grant, and R. G. Brown gratefully acknowledges this support. Details of the system can be obtained from:
<http://www.phy.duke.edu/brama/>
2. Created the Duke Beowulf User's Group (DBUG) website:
<http://www.phy.duke.edu/dbug/>
3. Linux-smp and beowulf contributor. As a natural extension of the work on distributed parallel systems, R. G. Brown has actively participated in the development and debugging of the network and adaptec (scsi disk) drivers in the linux kernel distributions. In addition, brahma provides a home for mirrors of the linux-smp FAQ and the beowulf website. In various linux mailing list groups, he has helped countless persons get over various humps in developing their own resources and hence has contributed to international productivity in science and industry. R. G. Brown, together with Dave Rahul of the University of Pennsylvania, organized the Extreme Linux section of the 1999 Linux Expo, which focused considerable attention on the beowulf effort and the possibilities of COTS parallel supercomputing. Most recently, R. G. Brown was selected to be on the organizing committee of the "IEEE International Symposium on Cluster Computing and the Grid" (CCGrid'2000), held in Brisbane, Australia in May, 2001.
4. Board member and cofounder of Market Driven. Primary author of Discover, a neural engine that can be used to do predictive modeling. This engine incorporates a number of proprietary improvements to standard neural algorithms to achieve high predic-

tivity with minimal training times. Is working on a set of genetic algorithms which similarly promise breakthroughs in genetic efficiency.

5. Chairperson and primary volunteer of the technology committee of Immaculata Catholic School in Durham, NC. Headed (and continues to work with as of 5/03) a project that basically wired the school and installed a proper client server network.
6. Board member of Copperfield's Books, a small independent California bookstore. Currently (05/03) guiding Copperfields through a difficult transition from "homemade" IT to a proper client/server network spanning multiple stores.
7. Author of "Who Shall Sing, When Man is Gone", and "Hot Tea", Gnu Open Publication License volumes of poetry, freely available at:
<http://www.phy.duke.edu/~rgb/Poetry/poetry.php>