

## SCOTT H. HAWLEY

Chemistry & Physics Dept  
Belmont University  
1900 Belmont Blvd  
Nashville, TN 37212-3757, USA

`scott.hawley@belmont.edu`  
Voice: +1 615-460-6206  
Fax: +1 615-460-5458

## PERSONAL INFORMATION

- Birthdate: Oct 18, 1972
- Birthplace: Hong Kong, B.C.C.
- Citizenship: U.S.A.
- Languages: English, German.

## EDUCATION

- Ph.D. in Physics. Under the supervision of Matthew W. Choptuik. University of Texas at Austin (UT-Austin), Austin, TX, August 2000. Dissertation entitled “Scalar Analogues of Compact Astrophysical Systems.”
- B.S. with Honors in Physics. College of William & Mary, Williamsburg, VA, May 1994.

## EMPLOYMENT

- Associate Professor of Physics (Tenured). Chemistry & Physics Dept, Belmont University. August 2013 to present.
- Assistant Professor of Physics. Chemistry & Physics Dept, Belmont University. August 2006 to 2013.
- Postdoctoral Research Assistant. Center for Relativity, Department of Physics, UT-Austin. October 2002 to July 2006.
- Postdoctoral Fellow. Numerical Relativity Group, Astrophysical Relativity Division, Max-Planck-Institut für Gravitationsphysik / Albert Einstein Institute (AEI), Golm, Germany. October 2000 to 2002.
- Graduate Research Assistant. Center for Relativity, Department of Physics, UT-Austin. Summer 1997, Summer 1998 to Summer 2000.
- Teaching Assistant. Department of Physics, UT-Austin. Fall 1995, Spring 1996, Fall 1996 to Spring 1998.
- Astrophysicist. Solar-Terrestrial Relationships Branch, Space Sciences Division, Naval Research Laboratory, Washington, DC. April 1995 to August 1995, Summer 1996.
- Physicist. Contracted to Army Research Laboratory, Ft. Belvoir, VA by Teletronics Inc. June 1994 to March 1995.

## PUBLICATIONS

- “Online music learning: informal, formal and STEAM contexts,” C. Johnson and S. Hawley, accepted for publications in *International Journal on Innovations in Online Education*, anticipated publication date December 2016.

- “Portal Bouncing and Oscillations,” *Teach With Portals*, Leslie Redd, editor, Valve Corporation, Publisher. [www.teachwithportals.com](http://www.teachwithportals.com). July 24 (2012).
- “Simple Harmonic Motion and Hookes Law,” *Teach With Portals*, Leslie Redd, editor, Valve Corporation, Publisher. [www.teachwithportals.com](http://www.teachwithportals.com). July 24 (2012).
- “Interactive Transistor Amplifier Applet,” *MERLOT: Multimedia Educational Resource for Learning and Online Teaching*, [www.merlot.org](http://www.merlot.org). August 5 (2012).
- “Interactive Simple Harmonic Oscillator Applet,” *MERLOT: Multimedia Educational Resource for Learning and Online Teaching*, [www.merlot.org](http://www.merlot.org). August 5 (2012).
- “Interactive Series RLC Circuit Applet,” *MERLOT: Multimedia Educational Resource for Learning and Online Teaching*, [www.merlot.org](http://www.merlot.org). August 5 (2012).
- Spin Dependence in Computational Black-Hole Data,” S.H. Hawley, R.A. Matzner and M. Vitalo. *General Relativity and Quantum Cosmology E-print Archive*, [gr-qc/0604100](https://arxiv.org/abs/gr-qc/0604100) (2006).
- “Dynamical evolution of quasi-circular binary black hole data,” M. Alcubierre, B. Bruegmann, P. Diener, F.S. Guzman, I. Hawke, S.H. Hawley, F. Herrmann, M. Koppitz, D. Pollney, E. Seidel, and J. Thornburg. *Phys. Rev.* **D72**:044004 (2005).
- “Evolutions in 3D Numerical Relativity Using Fixed Mesh Refinement,” E. Schetter, S.H. Hawley and I. Hawke. *Class. Quant. Grav.***21**:1465-1488 (2004).
- “Tips for Implementing Multigrid Methods on Domains Containing Holes,” S.H. Hawley and R. A. Matzner. *Class. Quant. Grav.***21**:805-822 (2004).
- “Towards Standard Testbeds for Numerical Relativity,” M. Alcubierre, G. Allen, T. W. Baumgarte, C. Bona, D. Fiske, T. Goodale, F. S. Guzmán, I. Hawke, S.H. Hawley, S. Husa, M. Koppitz, C. Lechner, D. Pollney, D. Rideout, M. Salgado, E. Schnetter, E. Seidel, H.-A. Shinkai, D. Shoemaker, B. Szilágyi, R. Takahashi and J. Winicour. *Class. Quant. Grav.***21**:589-613 (2004).
- “Numerical Evidence for ‘Multi-Scalar Stars’,” S.H. Hawley and M.W. Choptuik. *Phys. Rev.* **D67**:024010 (2003).
- “Boson Stars Driven to the Brink of Black Hole Formation,” S.H. Hawley and M.W. Choptuik. *Phys. Rev.* **D62**:104024 (2000).
- “The Green Line Corona and Its Relation to the Photospheric Magnetic Field,” Y.-M. Wang, N.R. Sheeley, Jr., S.H. Hawley, J.R. Kraemer, G.E. Brueckner, R.A. Howard, C.M. Korendyke, D.J. Michels, N.E. Moulton, D.G. Socker and R. Schwenn, *Astrophysical Journal* **485**:419-429 (1997).
- “Measurements of Flow Speeds in the Corona Between 2 and 30 R,” N.R. Sheeley, Jr., Y.-M. Wang, S.H. Hawley, G.E. Brueckner, K.P. Dere, R. A. Howard, M. J. Koomen, C. M. Korendyke, D.J. Michels, S.E. Paswaters, D.G. Socker, O.C. St. Cyr, D. Wang, P.L. Lamy, A. Llebaria, R. Schwenn, G.M. Simnett, S. Plunkett and D.A. Biesecker, *Astrophysical Journal* **484**:472-478 (1997).
- “The Magnetic Nature of Coronal Holes,” Y.M. Wang, S.H. Hawley and N.R. Sheeley, Jr. *Science* **271**:464-469 (1996).

#### SUBMITTED PUBLICATIONS UNDER REVISION

- “Visualizing Sound Directivity via Smartphone Sensors,” S.H. Hawley and R.E. McClain Jr., accepted pending revisions by *The Physics Teacher*, November (2016).

## PUBLISHED SOFTWARE

- “Polar Pattern Plotter,” S.H. Hawley, *iOS App Store*, June (2016).
- “Knobility: An App for Audio Session Documentation,” S.H. Hawley, *iOS App Store*, October (2015)

## OTHER SCHOLARLY PUBLICATIONS

- *PHY2010: Physics for Audio Engineering Technology Laboratory Manual*, S.H. Hawley (2007-2012). New editions each semester to present. Developed, tested and illustrated all laboratory exercises.
- *PHY2250: Electronics & Circuit Theory Laboratory Manual*, S.H. Hawley (2007-2012). New editions each semester to present. Developed, tested and illustrated all laboratory exercises.

## AWARDS, PRIZES AND RECOGNITION

- Director’s Discretionary Allocation, National Institute for Computational Sciences, Oak Ridge National Laboratories, Oak Ridge, TN, July 11, 2012. Awarded 250,000 Service Units (processor-hours), valued at \$0.45/SU for a total of \$112,500 worth of computer time on the machine known as Nautilus. Intended for “production”-level use of the machine for large, highly accurate parameter surveys of using binary black hole simulation computer code.
- Startup Allocation, National Institute for Computational Sciences, Oak Ridge National Laboratories, Oak Ridge, TN, September 15, 2011. Awarded 25,000 Service Units (processor-hours), valued at \$0.45/SU for a total of \$12,500 worth of computer time on the machine known as Nautilus. Intended for preliminary studies using binary black hole simulation computer code.
- Professional Development Award. Presented by the Office of Graduate Studies, UT-Austin, Nov. 1999.
- Finalist, Student Competition. Presented by the Texas Section of the American Physical Society, Oct. 1998.
- Research Publication Award. Presented by the Naval Research Laboratory, March 1997.
- Student Award for Outstanding Achievement in Physics. Presented by the Society of the Alumni, College of William & Mary, May 1994.
- Graduated Cum Laude with High Honors in Physics, College of William & Mary.

## INVITED TALKS (MEETINGS AND CONFERENCES)

- “The Eve of Gravitational Wave Astronomy,” Meeting of Bernard-Seyfert Astronomical Society, Adventure Science Center, Nashville TN, Aug 15, 2012.
- “Black Holes and Gravity Waves,” Tennessee Star Party, a gathering of professional and amateur astronomers, Lynchburg, TN, Sept 8, 2007.
- “Heavy Duty Astrophysics: Black Holes and Gravity Waves,” Meeting of Bernard-Seyfert Astronomical Society, Adventure Science Center, Nashville TN, Jan 18, 2007.

- “Spin-Spin Effects in Binary Black Hole Systems”, New Frontiers in Numerical Relativity Conference, Albert Einstein Institute, Potsdam Germany, July 2006.
- “Spin Interactions in Binary Black Hole Initial Data”, Numerical Relativity 2005 Conference, Goddard Space Flight Center, Nov 4, 2005.
- “Overview of a few General Relativistic Solitons”, 4th IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, University of Georgia, April 13, 2005.
- “Gravitating Globes of Multiple Scalar Fields,” Third International IMACS conference on “Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory”, Athens GA, April 8, 2003.

#### CONTRIBUTED TALKS (MEETINGS AND CONFERENCES)

- “Fourier Transforms, Audio Engineering, and the Quantum Nature of Reality,” S.H. Hawley, 135th Meeting of the Audio Engineering Society, New York, NY, Oct 16, 2013”.
- “Spin-Spin Effects in Binary Black Hole Systems AND Involving Undergraduates in Numerical Relativity Research”, American Physical Society April Meeting, Atlanta GA, April 2, 2012.
- “Spin-Spin Effects in Models of Binary Black Hole Systems,” S.H. Hawley, Tennessee Academy of Science Annual Meeting, Cookeville TN, Nov 10, 2010.
- “Study of Spin-Spin Interaction in Binary Black Hole Initial Data,” S.H. Hawley, 3rd Gulf Coast Gravity Meeting, March 23, University of Alabama at Huntsville, March 23 2007.
- “4 Tips for Implementing Multigrid Methods on Domains with Holes” S.H. Hawley and R.A. Matzner, American Physical Society meeting, April 2003.
- “Evolving Black Holes with Mesh Refinement,” Caltech TAPIR seminar, April 18, 2003.
- “Update on Using FMR/AMR for GR”, S.H. Hawley, Workshop on Formulations of Einstein Equations for Numerical Relativity Mexico City-UNAM, May 21, 2002.
- “Progress in Adaptive Mesh Refinement Techniques for Numerical Relativity,” S.H. Hawley and M.W Choptuik, Workshop on Numerical Relativity, Krugersdorp, South Africa, July 26, 2001.
- “Multi-Scalar Stars: Families of Relativistic ‘Solitons’,” S.H. Hawley and M.W Choptuik, at GR16: 16th Conference of the International Society on General Relativity, Durban, South Africa, July 19, 2001.
- “Critical Phenomena Associated with Boson Stars,” S.H. Hawley and M.W Choptuik, Proceedings of the 20th Texas Symposium on Relativistic Astrophysics, Dec. 14, 2000
- “Minimal Development of Parallel Adaptive Mesh Refinement Applications,” S.H. Hawley and M.W Choptuik, High Performance Parallel Computing Symposium, Applied Research Laboratories, UT-Austin, Dec. 2, 1999.
- “Toward Automatic Parallel Adaptive Mesh Refinement,” S.H. Hawley and M.W Choptuik, Meeting of the American Physical Society, Texas Section, Oct. 29, 1999.
- “Toward Automatic Parallel Adaptive Mesh Refinement,” S.H. Hawley and M.W Choptuik, High Performance Computing and Cactus Workshop, National Center for Supercomputing Applications (NCSA), University of Illinois at Urbana-Champaign, Oct. 1, 1999.

- “Multi-Scalar Stars and Their Relation to Critical Phenomena of Perturbed Boson Stars,” S.H. Hawley and M.W. Choptuik, Meeting of the American Physical Society, Texas Section, Oct. 1998.
- “Measurements of Flow Speeds in the Corona Between 2 and 30 R,” N.R. Sheeley, Jr., Y.-M. Wang and S.H. Hawley, Meeting of the American Geophysical Union, Fall 1996.
- “Relation Between the Large-Scale Photospheric Field and LASCO/EIT Coronal Structures During 1996,” Y.M. Wang, N.R. Sheeley, Jr., S.H. Hawley and J.R. Kraemer, Meeting of the American Geophysical Union, Fall 1996.
- “Changes to the Global Solar Coronal Structure Associated with an Active Region,” R. Howard, N.R. Sheeley, S.H. Hawley, J.R. Kraemer, Y.M. Wang, G.E. Brueckner, K.P. Dere, M.J. Koomen, C.M. Korendyke, D.J. Michels, J.D. Moses, D.G. Socker, M.D. Andrews, J.W. Cook, J.S. Morrill, N.E. Moulton, C.M. Korendyke, J.W. Cook, S.E. Paswaters, D. Wang, O.C. St. Cyr, S.E. Paswaters, D. Wang, P.L. Lamy, A.L. Lleberia, M.V. Bout, R. Schwenn, G.M. Simnett, S. Plunkett and D.A. Biesecker, Meeting of the American Geophysical Union, Fall 1996.

#### CONFERENCE PROCEEDINGS

- “e-Brief on Fourier Transforms, Audio Engineering, and the Quantum Nature of Reality,” S.H. Hawley, Engineering Brief for 135th Meeting of the Audio Engineering Society, New York, NY, Oct 16, 2013.
- Report on “Numrel 2005,” S.H. Hawley and R.A. Matzner, *Matters of Gravity*, **27**, Spring 2006. [gr-qc/0602119](#).
- “Multi-Scalar Stars: Families of Relativistic ‘Solitons’,” S.H. Hawley and M.W. Choptuik, Proceedings of GR16: 16th Conference of the International Society on General Relativity, Durban, South Africa.
- “Critical Phenomena Associated with Boson Stars,” S.H. Hawley and M.W. Choptuik, Proceedings of 20th Texas Symposium on Relativistic Astrophysics. Also available as [gr-qc/0103019](#).

#### OTHER CONFERENCE PARTICIPATION

- “Fast Elliptic Solves for Constrained Evolution and BBH Initial Data,” poster at 17th International Conference on General Relativity and Gravitation (GR17), Dublin, Ireland, July 23, 2004.
- Participant at month-long “Visitors Program on the Initial Data Problem,” hosted by the California Institute of Technology, Spring 2003.

#### PUBLIC SEMINARS

- Spoke on “The Eve of Gravitational Wave Astronomy,” hosted by Bernard-Seyfert Astronomical Society, Nashville’s amateur & professional astronomy club, August 15, 2012.
- “Parallel Adaptive Mesh Studies of Black Hole Spin-Spin Interactions,” Center for Computation and Technology, Louisiana State University, May 17, 2012.
- “Fast Elliptic Solves for Constrained Evolution and Initial Data,” Joint seminar for Physics Dept. and Center for Computation and Technology, Louisiana State University, Feb. 16, 2005.

- “Evolving Black Holes with Mesh Refinement”, Albert Einstein Institute, Golm, Germany, Sept. 3, 2002.
- “Report on the 1st Mexico Meeting on Formulations of Einstein’s Equations,” Relativity Seminar, UT-Austin, May 27, 2002.
- “Progress in Adaptive Mesh Refinement Applications in Numerical Relativity,” AEI, March 12, 2002.
- Review of Shinkai and Yoneda, “Adjusted ADM systems and their expected stability properties” (gr-qc/0110008), Numerical Relativity Journal Club, AEI, Dec. 17, 2001.
- “Boson Stars Driven to the Brink of Black Hole Formation,” Institute Seminar, AEI, Oct. 15, 2000.
- “Critical Phenomena Associated with Boson Stars,” Department of Physics and Astronomy, University of British Columbia, March 2, 2000.
- “Cactus: Get Used to It,” Relativity Seminar, Department of Physics, UT-Austin, Oct. 21, 1999.
- “Boson Stars and Other Scalar Objects,” High-Gravity Journal Club, Department of Astronomy, UT-Austin, Feb. 16, 1999.
- “New Compact Objects in Einstein-Klein-Gordon Systems,” Relativity Seminar, Department of Physics, UT-Austin, Oct. 8, 1998.
- “Compact Objects in Einstein-Klein-Gordon Systems,” Qualifier Defense and Relativity Seminar, Department of Physics, UT-Austin, Nov. 20, 1997.
- “Instabilities in Spiral Disks,” Theory Journal Club, Department of Astronomy, UT-Austin, Nov. 1997.

## TEACHING EXPERIENCE

- Physics 2010 - Physics for Audio Engineering, Belmont University. Fall 2006 to present. Developed a unique course to teach applied acoustics at a technical level appropriate for Audio Engineering Technology (AET) majors. Developed laboratory manual (see “Other Scholarly Work”).
- Physics 2250 - Electronics & Circuit Theory, Belmont University. Spring 2007 to present. Developed a unique course to teach electronics at a technical level appropriate for Audio Engineering Technology (AET) majors. Developed laboratory manual (see “Other Scholarly Work”).
- Physics 4410 - Survey of Advanced Physics, Belmont University. Spring 2011, 2013. Developed a unique course to teach concepts of hamiltonian dynamics, relativity, computational physics and statistical mechanics to physics majors.
- Physics 3110 - Analytical Mechanics, Belmont University. Fall 2006, 2008 and 2010, 2012, 2014. Second-year physics course in classical mechanics, using text by Fowles & Cassiday.
- Physics 1140 - Introduction to Physics, Belmont University. Summer 2008. A one-semester class encompassing mechanics, electricity and magnetism for AET majors.
- Physics 2110 & 2120 - General College Physics I & II, Belmont University. Fall 2006 through Spring 2007. A year-long calculus-based introductory physics course for science majors.

- Physics 301K - Classical Mechanics, UT-Austin. Substitute lecturer on several occasions during Fall 2005.
- Physics 387M - General Relativity I (graduate course), UT-Austin. Substitute lecturer on several occasions during Fall 2004, Fall 2003.
- Physics 306 - Elementary Physics Methods, UT-Austin. Substitute lecturer on several occasions during Spring 2004.
- Physics 375R - General Relativity I (undergraduate course), UT-Austin. Substitute lecturer on several occasions during Spring 2003.
- Physics 303K - Classical Mechanics and Thermodynamics (for Engineering students), UT-Austin, Fall 1997. Assistant to Professor C. Fred Moore. Ran discussion sections, held office hours, administered homework via the Physics Homework Service (a web-based interactive learning and grading platform, created by Prof. Moore and used by UT, local high schools, and other universities in the U.S.), was responsible for selecting problems for tests and homework and maintaining the database of problems, performed some assignment and grading of non-online work and assisted with administrative tasks.
- Physics 303L - Electromagnetism and Optics (for Engineering students), UT-Austin, Spring 1997, Spring 1998. Assistant to Professor C. Fred Moore. As above.
- Supervising graduate student for the Physics Homework Service, Fall 1997 and Spring 1998. Supervised the work of five other graduate students.
- Physics 103N - Laboratory for Physics 303L, UT-Austin, Fall 1995, Spring 1996, Fall 1996. Instructor. Gave lectures, developed curriculum, tested equipment, assigned and graded homework (lab reports), held office hours, was responsible for roughly 70 students in three class sections per semester.
- Various courses: Served one to two hours per week at the “coaching tables” in the UT Physics department building, where students from any course could come for help. Fall 1995 to Spring 1998 (excluding summers).
- Private Tutor, Fall 1994 and Spring 1995. Tutored in calculus and high school physics.

## UNIVERSITY SERVICE

- University Instructional Technology Committee, Fall 2013 to Present
- University Religion and Ethics Committee, Fall 2009 to Spring 2011.
- University Appointments Committee, Spring 2010 to Fall 2010.
- Served on two tenure-track faculty search committees for Audio Engineering Technology department, in Spring 2008 and 2010
- Coordinator/liaison for physics requirements in the ABET accreditation proceedings of the AET program. Spring 2009 through Fall 2011.
- CAS Professional Development Committee, Fall 2012 to present.
- CAS Student Life Committee, Fall 2007 to Spring 2009.
- CAS Committee on Policy and Procedures, 2009-2010.
- Representative for School of Sciences speaker series, and Chair of Speaker Series for Chemistry & Physics Department.
- Standing Committee on Assessment of the Chemistry & Physics Program.

- Chair of Standing Committee for General Education Assessment, Chemistry & Physics Department.
- Technical Computer Committee, AEI, Oct. 2000 to Sept. 2002.
- Graduate Welfare Committee, Department of Physics, UT-Austin, Aug. 1995 to May 1996.

## COMMUNITY SERVICE

- Spoke on “Bayesian Analysis for Audio Engineers,” at November 2014 meeting of the Music City Chapter of the Acoustical Society of America.
- Spoke on “The Eve of Gravitational Wave Astronomy,” at meeting of Bernard-Seyfert Astronomical Society, Nashville’s amateur & professional astronomy club, August 15, 2012.
- Spoke on physics of speakers, microphones and guitar pickups for “Tennessee Teens Rock’n’Roll Camp,” University School of Nashville, June 22, 2012.
- Prayer Intercessor, on Pastoral Care Team, Siloam Family Health Clinic, June 2012 to present.
- Flood relief, with Hands on Nashville and City Church of East Nashville, May 2010.
- Volunteer with Nashville Humane Association, 2007 to present.
- Gave a public lecture on “Heavy Duty Astrophysics: Black Holes and Gravitational Waves” at Adventure Science Center, Nashville TN. January 18, 2007.
- Initiator and leader of a reading/discussion group on the philosophy of science, for professional scientists and other interested persons in the Berlin area. May 2001 to May 2002.
- Creator and maintainer of a guide for new international scientists at the Max Planck Campuses in Golm, Germany. This guide has now been expanded upon and adopted by the AEI administration, who are circulating it among other Max Planck Institutes in Germany.

## MEMBERSHIP IN PROFESSIONAL SOCIETIES

- Acoustical Society of America: Vice President of Music City Chapter, 2014-present.
- Audio Engineering Society
- American Physical Society

## REFERENCES

- Dr. Robert Magruder (current supervisor), Professor and Chair, Chemistry & Physics Dept, Belmont University. [robert.magruder@belmont.edu](mailto:robert.magruder@belmont.edu)
- Dr. Thomas Spence, Chair, College of Sciences & Mathematics, Belmont University. [thom.spence@belmont.edu](mailto:thom.spence@belmont.edu)