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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. in Physics. College of William & Mary, Williamsburg, VA, May 1994.

EMPLOYMENT

- Postdoctoral Research Assistant. Center for Relativity, Department of Physics, UT-Austin. October 2002 to present. Developed numerical code (a parallel multigrid solver) for efficient solution of Einstein constraint equations. Key developer of Carpet, a fixed mesh refinement package now in common usage throughout the numerical relativity community. Performed first binary black hole evolutions using Carpet; persuing 3D critical collapse of Brill waves. Supervised undergraduate research and helped direct graduate research (P. Walter, M. Baumann, J. Schirmer, E. Albracht, A. Bechinger, V. Natchu, M. Palmer, A. Trumble). Taught classes in introductory physics and general relativity. Maintained the Center’s weekly seminar schedule and computer systems.
- Postdoctoral Fellow. Numerical Relativity Group, Astrophysical Relativity Division, Max-Planck-Institut für Gravitationsphysik / Albert Einstein Institute (AEI), Golm, Germany. October 2000 to 2002. Studied dynamics of compact objects, implementation of adaptive mesh refinement (AMR) techniques, numerical evolutions of binary black holes, distorted rotating black holes, prediction of gravitational wave form signals, critical phenomena in gravitational collapse, and hydrodynamic wind accretion in rotating black hole spacetimes.
- Graduate Research Assistant. Center for Relativity, Department of Physics, UT-Austin. Summer 1997, Summer 1998 to Summer 2000. Performed numerical investigations in to the dynamical effects of strong-field gravity. Studied relativistic solitons, compact objects, quasinormal modes and large perturbations of boson stars, critical phenomena in gravitational collapse, and relativistic hydrodynamics. Worked to create a development environment for high-performance computing applications featuring parallel AMR.
- Teaching Assistant. Department of Physics, UT-Austin. Fall 1995, Spring 1996, Fall 1996 to Spring 1998. Taught laboratory sessions and recitation sections for introductory physics classes. Developed lessons, lectured, tutored. Supervised other teaching assistants for the management of a database of physics problems which students accessed via the internet. Applied principles of participatory learning, with an emphasis on the understanding of physics concepts.
- Astrophysicist. Solar-Terrestrial Relationships Branch, Space Sciences Division, Naval Research Laboratory, Washington, DC. April 1995 to August 1995, Summer 1996. Performed phenomenological studies of the solar corona using ground-based and satellite data. Made the first measurements of flow speeds from the photosphere to the solar wind, using images from the LASCO coronagraph.

- Physicist. Contracted to Army Research Laboratory, Ft. Belvoir, VA by Teletronics Inc. June 1994 to March 1995. Developed and implemented algorithms for atmospheric modeling, radiative transfer and infrared sensor simulation to be used in an artificial scene rendering computer code called CREATION (Computer-generation of Realistic Environments with Atmospheres for Thermal Imagery with Optics and Noise).

HONORS

- 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.

TEACHING EXPERIENCE

- 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.

INVITED TALKS

- “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 Non-linear 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 “Non-linear Evolution Equations and Wave Phenomena: Computation and Theory”, Athens GA, April 8, 2003.

CONTRIBUTED TALKS

- “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.

SEMINARS

- “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.
- “Fast Elliptic Solves for Constrained Evolution and BBH Initial Data,” 17th International Conference on General Relativity and Gravitation (GR17), Dublin, Ireland, July 23, 2004.
- “Evolving Black Holes with Mesh Refinement”, AEI, 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.

COMMITTEE SERVICE

- Technical Computer Committee, AEI, Oct. 2000 to Sept. 2002.
- Graduate Welfare Committee, Department of Physics, UT-Austin, Aug. 1995 to May 1996.

COMMUNITY OUTREACH

- 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.

CONFERENCE PROCEEDINGS

- 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

- Invited to “Visitors Program on the Initial Data Problem,” hosted by the California Institute of Technology, Spring 2003.

PUBLICATIONS

- (In Preparation): “Spin Dependence in Computational Black-Hole Data,” S.H. Hawley, R.A. Matzner and M. Vitalo.
- (In Preparation): “Shift Conditions for Orbiting Binaries in Numerical Relativity,” M. Alcubierre, B. Bruegmann, P. Diener, F.S. Guzman, S.H. Hawley, M. Koppitz, D. Pollney, E. Seidel.
- “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).

REFERENCES

- Richard A. Matzner (current boss), Professor and Director, Center for Relativity, Department of Physics, University of Texas at Austin, Austin, TX 78712. Phone: (512) 471-5062. matzner2@physics.utexas.edu
- Edward Seidel (former boss), Director, Center for Computation & Technology, Johnston Hall, Louisiana State University, Baton Rouge, LA 70803. Phone: (225) 578-7877. eseidel@lsu.edu
- Cecile Dewitt-Morett, Jane and Roland Blumberg Centennial Professor Emeritus, Center for Relativity, Department of Physics, University of Texas at Austin, Austin, TX 78712. Phone: (512) 471-1052. cdewitt@physics.utexas.edu
- Gregory A. Shields (impressed with my teaching), Jane and Roland Blumberg Centennial Professor in Astronomy, Department of Astronomy, University of Texas at Austin, Austin, TX 78712. Phone: (512) 471-1402. shields@astro.as.utexas.edu
- Lawrence C. Shepley, Professor (retired), Center for Relativity, Department of Physics, University of Texas at Austin, Austin, TX 78712. Phone: (512) 327-1511. larry@einstein.ph.utexas.edu
- Matthew W. Choptuik (dissertation supervisor), Professor, CIAR Cosmology and Gravity Program, Department of Physics and Astronomy, University of British Columbia. Phone: (604) 822-2412. matt@laplace.physics.ubc.ca