

JENNIFER A. SEILER

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Personal

Date of Birth: May 5th, 1983
Place of Birth: Washington DC, United States
Citizenship: United States
Marital Status: Unmarried
First Language: English

Education

ALBERT EINSTEIN INSTITUTE *Ph.D. in Astrophysical Relativity*
Potsdam, Germany Expected November 2009
Thesis Title: *Well-posedness in Numerical Simulations of Black Hole Spacetimes*
Thesis Advisers: Luciano Rezzola & Bernard Schutz
University Affiliation: Hannover University via the International Max Planck Research School Fellowship

CORNELL UNIVERSITY *B.A. Physics*
Ithaca, NY Aug 2001 - May 2005
Adviser: Saul Teukolsky
Research Emphasis: Computational Physics; Numerical Relativity

HAYFIELD SECONDARY SCHOOL *H.S. Honors A.P.*
Alexandria, VA Sept 1997 - June 2001
Research Emphasis: Physics; Architecture; Computer Science

Fellowships, Grants, and Awards

James Hartle Award: talk *Constraint Preserving Boundaries in 2nd Order Form* at GRG18
<http://arxiv.org/pdf/0709.0942>
NASA NY Space Grant 2003: For work under Saul Teukolsky on DUSTVis
Fermi National Accelerator Lab Internships for Physics Majors 2002: BTeV Trigger Algorithm
US DoD's SEAP (Science and Engineering Apprenticeship Program) 2001
Award of Recognition of Outstanding Achievement, US Naval Research Laboratory
Recognition from Nat. Science Teachers Association (for *Longitudinal Flow in Au-Au Collisions*)
Recognition from Graduate Women in Science (for *Acoustic Thermometry of Sea Water*)
Intel Science Talent Search Semifinalist 2001 (for *Longitudinal Flow in Au-Au Collisions*)
http://www.sciserv.org/sts/60sts/semi_VA.asp
University of Southern California Young Scientist of the Year 2000
CIA Outstanding Young Scientist (for *Acoustic Thermometry of Sea Water*)
Armed Forces and Communications and Electronics scholarship and internship for summer of '99
Award of Recognition: the Society of Women Engineers (*Acoustic Thermometry of Sea Water*)
Intel Virginia State Science Talent Search 2nd place (for *Longitudinal Flow in Au-Au Collisions*)
Grand Prize alternate in the NOVA Intel Science and Engineering Fair
Honors Science Program at Michigan State University in the National Superconducting Cyclotron
Physlink.com Young Scientist of the Year 2000 (for *Acoustic Thermometry of Sea Water*)
http://www.physlink.com/ysaward2000_press.cfm

Research Experience

June 2005 - Present: I worked on numerical simulations of black hole spacetimes. My work was mostly with a code which uses a Generalized Harmonic formulation of the Einstein Equations. My focus was on well-posed constraint preserving boundary conditions. With additional work on constraint damping methods, and the use of Pade extrapolation for Apparent Horizon excision boundaries.

Dr. Bela Szilagyi: Bela.Szilagyi@aei.mpg.de

June 2004 - August 2004: I was a visitor to the Max-Planck-Institute for Gravitational Physics in Potsdam, Germany. Using an open-source toolbox in an environment called Cactus, I wrote a numerical code to simulate the propagation of gravitational waves off a potential in a three dimensional coordinate system. I wrote a generalization of the Zerilli Equation that reduced the problem to a radial equation expanded to three dimensions with spherical harmonics.

Dr. Denis Pollney: Denis.Pollney@[a4paperaei.mpg.de

November 2002 - October 2004: I worked for Prof. Saul Teukolsky on software for the visualization of numerical simulations of relevant solutions to the Einstein equations. These included inspiraling neutron stars toward super-massive black holes, interacting black holes. Called DUSTVis, it is a OpenDX visualization program designed to be used with the Caltech/Cornell DUST algorithm. It is used to patch domains together visualize and reasonably interpolate them. We also worked on software for the visualization of warped neutron star accretion disks.

Prof. Saul Teukolsky: Saul@astro.cornell.edu

December 2004 - May 2004: We designed a program and system for the implementation of an industrial chemical waste exchange program, titled the National Trash/Treasure Network, for submission to the EPA as a project for voluntary participation offered to companies as an alternative to fines. The program requires the seller only to enter his or her location, the amount of waste and its MSDS number. The buyer may search for a chemical and the program gives a list of chemicals offered which involve it. A neural network finds other chemicals with similar properties for the buyer.

Prof. Alan McAdams: akm3@cornell.edu

May 2002-August 2002: I participated in Fermi National Accelerator Laboratory's Internship for Physics Majors Program (IPM). I worked under supervisor Jin-yuan Wu on a project called BTeV. BTeV will be looking for rare B-meson and charm decays, trying to find a value for sine 2-beta and better understand rare decays. I coded parts of the tracking algorithm for the Level 1 Trigger Code. This code finds hits on the silicon pixel detectors in the central event region of the detector and tries to match them to tracks, find the location of primary events, and looks for detached tracks which may signify an interesting decay.

Dr. Jin yuan Wu: jywu168@fnal.gov

June 2001 - Sept. 2001: I worked at the Naval Research Laboratory in the Electronics Science & Technology Division on the optimization of natural growth of Silicon dioxide, SiGe, and SiC samples via Molecular Beam Epitaxy. I also experimented with the temperature and surface segregation dependencies of Phosphorous doping rates via MBE. During my time at the NRL I gained experience with XPS, SIMS, STMs, MBE, and SEMs. I also helped to update their old XPS data acquisition system by monitoring the GPIB communication between the XPS system, the Channeltron, and the server.

Dr. Philip Thompson: thompson@nrl.navy.mil

Dr. Glenn Jernigan: glenn.jernigan@nrl.navy.mil

May 2000 - August 2000: I worked in the National Superconducting Cyclotron at Michigan State University. I wrote data analysis code in C++ and did the analysis of data collected of Au on Au collisions at energies from 20-60 AMeV. I did analysis of the longitudinal flow in these collisions to work towards a nuclear equation of state to work towards better understanding of flow through in stellar core collapses.

Dr. Gary Westfall: westfall@nscl.msu.edu

- Publications** L. Rezzolla, P. Diener, E. N. Dorband, D. Pollney, C. Reisswig, E. Schnetter, J. Seiler. **The Final Spin From the Coalescence of Aligned-spin Black-hole Binaries.** *Astrophys. J.* **674** (2008) L29. Preprint: arXiv.org:0710.3345 [gr-qc]
- L. Rezzolla, E. Barausse, E. N. Dorband, D. Pollney, C. Reisswig, J. Seiler and S. Husa. **On the final spin from the coalescence of two black holes.** *Phys. Rev. D* **78** (2008) 044002. Preprint: arXiv:0712.3541[gr-qc]
- J. Seiler, B. Szilagyi, D. Pollney. **Constraint Preserving Boundaries for a Generalized Harmonic Evolution Systems.** *Class. Quant. Grav.* **25** (2008) 175020. Preprint: arXiv:0802.3341 [gr-qc]
- B. Aylott, *et al.*(including J. Seiler). **Testing gravitational-wave searches with numerical relativity waveforms: Results from the first Numerical INJection Analysis (NINJA) project.** *Classical and Quantum Gravity.* Preprint: arXiv:0901.4399 [gr-qc].
- B. Aylott, *et al.*(including J. Seiler). **Status of NINJA: the Numerical INJection Analysis project** *Classical and Quantum Gravity* **26**, 114008 (2009) 114008 Preprint: arXiv:0905.4227[gr-qc]
- C. Reisswig, S. Husa, L. Rezzolla, E. Dorband, D. Pollney and J. Seiler. **Gravitational-wave detectability of equal-mass black-hole binaries with aligned spins.** Preprint: arXiv:0907.0462[gr-qc]
- P. Ajith, *et al.* (including J. Seiler). **“Complete” gravitational-waveforms for black-hole binaries with non-precessing spins.**

Contributed Talks

- “Final Spin from Binary Black Hole Coalescence”**
Salamanca, Spain September 19, 2008
 XXXI Spanish Relativity Meeting (E.R.E. 2008)
- “From General Relativity to Black Hole Observation”**
Salamanca, Spain September 19, 2008
 XXXI Spanish Relativity Meeting (E.R.E. 2008) (plenary talk)
- “Final Spin from Binary Black Hole Coalescence”**
California Institute of Technology, Pasadena, CA, USA August 22, 2008
 TAPIR Theoretical Astrophysics and Relativity Seminar
- “2nd Order in Space Constraint Preserving Summation by Parts Boundaries”**
Puerto de la Cruz, Tenerife, Spain September 10-14, 2007
 XXX Spanish Relativity Meeting (E.R.E. 2007)
- “Constraint Preserving Boundary Treatment in 2nd Order Form”**
Sydney, Australia July 8-14, 2007
 18th International Conference on General Relativity and Gravitation (GRG18)

- “Boundary Treatments for the Einstein Equations in 2nd Order Form”**
Palma de Mallorca, Spain September 4-8, 2006
 XXIX Spanish Relativity Meeting (E.R.E. 2006)
- “Generalised Harmonic Coordinates in 2nd Order ”**
AEI, Potsdam, Germany November, 2005
 Sonder-Forschungsbereich / TransRegio 7 Video Seminars
- “Generalised Harmonic Coordinates using Abigel”**
Oberjoch, Germany October 10-14, 2005
 2005 Oberjoch Seminars

Workshops and Conferences

- Numerical Relativity and Data Analysis Meeting (NRDA 2009)
Golm, Germany July 6-9, 2009
- XXXI Spanish Relativity Meeting (E.R.E. 2008)
Salamanca, Spain September 15-19, 2008
- Numerical Relativity and Data Analysis Meeting (NRDA 2008)
Syracuse, NY August 11-14, 2008
- Frontiers in Numerical Gravitational Astrophysics (J.A. Wheeler School)
Erice, Italy June 27-July 5, 2008
- Post Newton 2008 International Workshop
Jena, Germany June 11-14, 2008
- XXX Spanish Relativity Meeting (E.R.E. 2007)
Puerto de la Cruz, Tenerife, Spain September 10-14, 2007
- 18th International Conference on General Relativity and Gravitation (GRG18)
Sydney, Australia July 8-14, 2007
- AEI Performance Improvement Workshop
Albert-Einstein-Institut, Potsdam, Germany December 4-15, 2006
- From Geometry to Numerics Workshop
Institut Henry Poincaré, Paris, France November 20-24, 2006
- XXIX Spanish Relativity Meeting (E.R.E. 2006)
Palma de Mallorca, Spain September 4-8, 2006
- New Frontiers in Numerical Relativity Conference
Albert-Einstein-Institut, Potsdam, Germany July 17-21, 2006
- 3rd High-End Visualization Workshop
University of Innsbruck, Obergurgl, Austria April 25-28, 2006
- 2005 Oberjoch Seminars
University of Tübingen, Oberjoch, Germany October 10-14, 2005

Special Skills

Languages: English (native), German (Basic), Spanish (Basic)

Operating Systems: Linux (preferred), Windows, Mac, DOS

Programming Languages: C/C++, SML, FORTRAN, PASCAL, Basic, Perl, Python, HTML, LaTeX, Java ...

Libraries & Software: LAPACK, HDF5, VTK, OpenDX, Scai, OpenMPI, MPICH, LAM, Cactus, Octave

Proficient with: AutoCAD, 3D Studio Max, Flash, Bryce, Mathematica, Maxima, ROOT, VisIt, Amira, PAW, vi, emacs ...

Supercomputing on: Peyote, Lagavulin, Belladonna, Damiana, Leibniz Computer Center (Munich), Teragrid and Louisiana Optical Network Initiative cluster