Eric W. Hirschmann

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Date of Birth	April 19, 1967
Place of Birth	Washington D.C., USA
Citizenship	USA

Education

University of California at Santa Barbara
Ph.D in Physics, June 1996

Brigham Young University, Provo, Utah
B.S. with University Honors in Physics *magna cum laude*, August 1991

Honors and Awards

Dissertation Fellowship, University of California at Santa Barbara, January 1996

Karl G. Maeser scholarship, Brigham Young University, August 1991

Valedictory speaker, Brigham Young University, August 1991

Conferences and Talks

I attended and presented papers at both the March 1995 and the March 1996 Pacific Coast Gravity Meetings. I also presented a paper at the Marcel Grossmann meeting in Jerusalem in June 1997. I have given seminars at UCSB in November 1995, at the University of Texas at Austin in February and again in September 1996 as well as a colloquium at Brigham Young University in March 1996.

Research and Teaching Experience

Postdoctoral Research Associate — **Center for Relativity**
University of Texas at Austin — **Sep 1996 – present**
My work has ranged over a variety of topics related to classical general relativity with a particular emphasis on numerical relativity. Recent work has included numerical simulations of texture collapse and generalizing an exact solution describing critical collapse to a wide class of matter models. I have been studying critical behavior in the classical Einstein-Yang-Mills-Higgs system in spherical symmetry and worked to develop finite difference schemes in order to integrate the coupled hyperbolic-elliptic PDE's of general relativity. In particular, I am developing numerical codes to investigate gravitational collapse in rotating, axisymmetric spacetimes.

Lecturer — **Physics Department**
University of Texas at Austin — **Jan 1997 – May 1997**
During the Winter 1997 semester, I taught an introductory Physical Science class. This laboratory based class was designed to allow students with little or no science and math background to learn basic physics principles. I oversaw all aspects of the class in that I gave short lectures, assisted the students in carrying out experiments and administered exams.

Research Assistant — **Physics Department**
University of California at Santa Barbara — **Sep 1993 – Aug 1996**
During this time, I was involved in several projects relating to the gravitational collapse of various matter fields. In particular, we investigated the scaling relations and universality which have recently been shown to be a ubiquitous part of gravitational collapse. In

addition, with Dean Welch, I investigated some solutions of Einstein gravity in 2+1D.

Teaching Assistant **Physics Department**
University of California at Santa Barbara **Sep 1991 – Jun 1994**
In tandem with my work towards a Ph.D, I assisted in several undergraduate and graduate physics classes. I was involved at all levels of physics instruction, teaching introductory physics classes as well as grading the undergraduate Classical Mechanics course and the following graduate classes: Math Methods for Physicists, Electromagnetism and Quantum Field Theory. In collaboration with Professor David Cannell, I also rewrote the curriculum for one of the introductory physics labs in order to introduce and teach statistics and probability.

OTHER ACADEMIC ACTIVITIES

I have served as a referee for *Physical Review Letters*, *Physical Review* **D** and *Classical and Quantum Gravity*.

PUBLICATIONS:

Universality and Scaling in the Gravitational Collapse of a Complex Scalar Field
Phys. Rev. **D 51**, 1995 pg. 4198-4210; gr-qc/9412066.
(with D. M. Eardley.)

Critical Exponents and Stability at the Black Hole Threshold for a Complex Scalar Field
Phys. Rev. **D 52**, 1995 pg. 5850-5856; gr-qc/9506078.
(with D. M. Eardley.)

S-Duality at the Black Hole Threshold of Gravitational Collapse
Phys. Rev. **D 52**, 1995 pg. R5397-R5401; gr-qc/9505041.
(with D. M. Eardley and J. H. Horne.)

Magnetic Solutions to 2+1 Gravity
Phys. Rev. **D 53**, 1996 pg 5579-5582; hep-th/9510181.
(with D. L. Welch.)

Criticality and Bifurcation in the Gravitational Collapse of a Self-Coupled Scalar Field
Phys. Rev. D **D 56**, 1997 pg 4696-4705; gr-qc/9511052.
(with D. M. Eardley.)

Comment on "Instabilities in Close Neutron Star Binaries"
Jan 1996. gr-qc/9601019.
(with D. M. Eardley.)

Instability of an "Approximate Black Hole"
Phys. Rev. **D 55**, 1997 pg 6014-6018; gr-qc/9701011.
(with M. W. Choptuik and S. L. Liebling.)

Dynamical Instability and Critical Behavior of van Putten's "Approximate Black Hole"
submitted, *Conference Proceedings of the Eighth Marcel Grossmann Meeting.*
(with M. W. Choptuik and S. L. Liebling.)

Spherical Self-Similar Solutions in Einstein-Multi-Scalar Gravity
submitted, *Phys. Let. A* Feb 1998.
(with A. Wang.)

Pair Production in the Collapse of a Hopf Texture
in preparation.
(with S. L. Liebling.)