

## **SAVITRI V. IYER**

Curriculum Vitae, August 2009

iyer@geneseo.edu

Department of Physics & Astronomy  
SUNY Geneseo, Geneseo, NY 14454  
(585) 245-5540

### **EDUCATION**

**UNIVERSITY OF PITTSBURGH**, Pittsburgh, PA

**Ph.D., Physics** 1993

Department Teaching Award. (see below)

**IOWA STATE UNIVERSITY**, Ames, IA

**M.S., Physics** 1989

**INDIAN INSTITUTE OF TECHNOLOGY**, Chennai, India

**M.Sc., Physics** 1986

Merit Scholarship

**MEENAKSHI COLLEGE FOR WOMEN**, Chennai, India

**(3-yr) B.Sc., Physics** 1981-1984

First Class

College (Student) Vice President, 1983-1984, Class Representative, 1981-1984

### **EMPLOYMENT**

**STATE UNIVERSITY OF NEW YORK**, Geneseo, NY

Department of Physics and Astronomy

Rotating Associate Dean of the College, 2009-2011

Associate Professor, 2003-2009

Visiting Research Associate, Duke University, Durham, NC, Fall 2005 (on sabbatical leave)

Assistant Professor, 1996-2003

Visiting Assistant Professor, Spring 1996

Visiting Assistant Professor, 1994-95

Adjunct Lecturer, Fall 1993

**UNIVERSITY OF PITTSBURGH**, Pittsburgh, PA

Teaching Assistant for a Graduate laboratory course, Summer 1993

Undergraduate Academic Advisor, 1991-1993

Teaching Assistant, 1989-1991

**IOWA STATE UNIVERSITY**, Ames, IA

Teaching Assistant, 1986-1989

### **AWARDS AND FELLOWSHIPS**

**“MID-CAREER SUMMER RESEARCH FELLOWSHIP”**

SUNY Geneseo, NY, Summer 2006

**“PRESIDENTIAL AWARD FOR EXCELLENCE IN ACADEMIC ADVISING”**

SUNY Geneseo, NY, Fall 2005

**“PRESIDENTIAL SUMMER RESEARCH FELLOWSHIP”**

SUNY Geneseo, NY, Summer 1997

**“EXCELLENCE IN TEACHING AWARD”**

Citation: “... has served with distinction as a recitation instructor in introductory physics courses. Her students have commented repeatedly on her ability to make physics both clear and interesting. Her outstanding performance in carrying out her teaching duties will serve as a model for future Teaching Assistance in the Department of Physics and Astronomy.”

University of Pittsburgh, Pittsburgh, PA, April 1990

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### **TEACHING**

#### **COURSES TAUGHT AT SUNY GENESEO:**

ASTR 100 Introductory Astronomy: Fall 1996, 1997, 1998 and 1999  
ASTR 101 Introductory Astronomy Lab: Fall 1996 and 1999  
PHYS 111 General Physics I: Fall 1994 (lab), Fall 2002 and 2003  
PHYS 120 Freshman Physics Experience: Fall 1997, 1998, 2002, 2003 and 2008  
PHYS 124 Analytical Physics I Lab: Fall 1993-1994, 1996-2004, 2006-2008  
PHYS 125 Analytical Physics II: Spring 1996-1999, 2003-2009  
PHYS 126 Analytical Physics II Lab: Spring 2000, 2003, 2005-2009  
PHYS 224 Analytical Physics IV: Spring 2000, 2005  
PHYS 226 Optics and Modern Physics Lab: Spring 1995 (2 sections), 1998-2000, 2003-2004  
PHYS 311 Classical Mechanics: Fall 1994  
PHYS 335 Intermediate Electricity and Magnetism I: Fall 1993, 2002-2004 and 2006  
PHYS 336 Intermediate Electricity and Magnetism II: Spring 1995-99, 2006 and 2008  
PHYS 344 Statistical Thermodynamics: Fall 1996, 1997, 1998, 1999, 2006-2008  
PHYS 352 Quantum Mechanics: Fall 2000 and 2004  
PHYS 353 Quantum Mechanics II: Spring 2007 and 2009  
PHYS 388 Exp: Gravity: Introduction to General Relativity: Spring 2006  
PHYS 394 Independent Research: Fall 2000  
PHYS 399 Directed Study: see below  
HONR 302 Roots of 20th Century Science: Spring 1997 and 2004  
HONR 393 Honors Research: Fall 1997 and Spring 1998  
INTD 388 Exp: Math, Physics and Consciousness, Spring 1996  
(team taught with Dr. Bill Edgar and Dr. Gary Towsley)

### **RESEARCH**

#### **SPECIALIZATION:**

General Relativity, Gravitational Lensing, Geometrical Methods, Theoretical Physics.  
PhD Thesis Title: Non local Reformulation of General Relativity.  
Thesis advisor: Dr. E.T. Newman, Department of Physics, University of Pittsburgh.

#### **PROJECTS:**

Bending Angle near a Kerr Black Hole in the Strong Deflection Limit.  
Magnification and Image Positions for the Schwarzschild Case.  
Bending Angle near a Schwarzschild Black Hole in the Strong Field Limit.  
Geometric analysis of caustic singularities and asymptotics in a curved spacetime setting.  
Gravitational Lensing near Spinning Black Holes.  
Two-dimensional hydrodynamics and Random Matrix Theory.  
Null Surface Formulation of General Relativity.  
Evolution of Caustics and Singularities in the Collapse of an Ellipsoidal Wavefront.

### **ACADEMIC ADVISING**

Recipient of the SUNY Geneseo Presidential Award for Excellence in Academic Advising, Fall 2005.  
University of Pittsburgh, College of Arts and Sciences Advising Center. Academic  
advisor for 135 students. Course selection and scheduling, departmental requirements,  
self-designed majors, career preparation. (Summer 1991 to Spring 1993)

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### STUDENT RESEARCH

#### **DIRECTED STUDY AND UNDERGRADUATE RESEARCH:**

- SUMMER 2009** Eddie Hansen: Bending of Light near Kerr Black Holes  
(supported by the Dr. Jerry D. Reber Student/Faculty Research Fund.)
- SPRING 2008** Aric Hackebill: Thermodynamics and Black Holes.
- SPRING 2007** Garrett Jones and Donovan Schickley: Vortex Dynamics in 2D.
- SPRING 2004** Alex Waldauer: The Eikonal Equation.
- FALL 2003** Alex Waldauer: Gravitational Lensing (contd.)
- SPRING 2003** Dan Riley and Chris Peters: Vortex Dynamics (contd.)  
Alex Waldauer: Gravitational Lensing.
- FALL 2002** Dan Riley and Chris Peters: Vortex Dynamics.
- FALL 1998** Neil Di Spigna: Evolution of Wavefronts in the Spacetime Manifold.  
Tom Wakeman: Symmetry and Conservation Laws
- SPRING 1998** Greg Benson: General Relativity and the GPS (Honors research).  
Richard Schugart: Knot Theory and Physics.
- FALL 1997** Greg Benson: Computational Special Relativity (Honors research).  
Richard Schugart: Introduction to Quantization of Gravity.
- SPRING 1997** Joshua Klyber: Numerical General Relativity.
- FALL 1996** Emmanuel Ambrose: Math Techniques in Science and Engineering.  
Joshua Klyber: Introduction to the Theories of Relativity.
- SPRING 1995** James Giumarra: Introduction to Tensors.
- FALL 1994** Robert Fuentes: Introduction to General Relativity.

#### **UNDERGRADUATE ORAL AND POSTER PRESENTATIONS:**

- "Thermodynamics and Black Holes," by Aric Hackebill, 2008
- "Vortex Dynamics in Two-Dimensions," by Garrett Jones and Donovan Schickley, 2007
- "The Eikonal Equation in Flat Space," by Alex Waldauer, 2004
- "Gravitational Lensing and Light Cones," by Alex Waldauer, 2003
- "Vortex Dynamics in Two-Dimensional Inviscid Flow," by Chris Peters and Dan Riley, 2003
- "Evolution of Wavefronts in Spacetime Manifolds," by Neil DiSpigna, 1997
- "Knot Theory and its Application to General Relativity," by Rich Schugart, 1997

### GRANTS

#### **INTERNAL GRANTS:**

- Youngs and Linfoot Real Estate Faculty Incentive Award
- Mid-Career Fellowship, Summer 2006, \$4000.
- Geneseo Travel Grant to the "9th Eastern Gravity Meeting," March 2006, \$654.
- Geneseo Travel Grant to the "AAPT Topical Conference: Teaching General Relativity to Undergraduates," July 2006, \$436.
- Dr. Nuala McGann Drescher Affirmative Action/Diversity Leave Program, 2001-2002.
- College Planning Council Grant for Spring 1998, Astronaut Visit for the Year of the 60s theme.
- Presidential Summer Fellowship, Summer 1997, \$3000.

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### PRESENTATIONS

- “*Bending of Light Near a Black Hole*,” Mathematical Physics Seminar at the University of Rochester, November 19, 2009.
- “*Space, Time and Spacetime*,” Math Day at Corning Community College, October 8, 2009.
- “*Space, Time and Spacetime*,” Math Day at Corning Community College, October 9, 2008.
- “*Bending of Light Near a Black Hole in the Strong Deflection Limit*,” Astronomy and Astrophysics colloquium, RIT/University of Rochester, March 17, 2008.
- “*Space, Time and Spacetime*,” Math Day at Corning Community College, October 11, 2007.
- “*Spacetime is Warped! What’s New?*” Eileen Collins Observatory at Corning Community College, co-sponsored by the Elmira-Corning Astronomical Society, June 1, 2007.
- “*Strong Deflection Bending of Light in Schwarzschild Geometry*,” Geometric and Stochastic Lensing Workshop: Applications to Black Holes and Dark Matter, Petters Research Institute, Dangriga, Belize, January 5-12, 2007.
- “*Space, Time and Spacetime*,” Math Day at Corning Community College, October 12, 2006.
- “*Bending of Light Near a Black Hole*,” Colloquium talk at the Department of Physics at SUNY Brockport, March 23, 2006.
- “*Space, Time and Spacetime*,” Math Day at Corning Community College, October 6, 2005.
- “*Space, Time and Spacetime*,” Math Day at Corning Community College, October 7, 2004.
- “*Geometry and Physics*,” Physics Department colloquium at SUNY Geneseo, November 7, 2002.
- “*Light Cones and General Relativity*,” Department of Physics, University of Maine, Orono, October 10, 1997.
- “*Knots*,” Physics Department colloquium at SUNY Geneseo, September 25, 1997.
- “*The Role of the Light Cone in Relativity*,” Physics Department colloquium at SUNY Geneseo, March 20, 1997.
- “*Spin and the Riemann Sphere*,” Physics Department colloquium at SUNY Geneseo, March 14, 1996.
- “*A Reality Check on Quantum Mechanics*,” Physics Department colloquium at SUNY Geneseo, November 2, 1995.
- “*Geometry and Special Relativity*,” Physics Department colloquium at SUNY Geneseo, April 13, 1995.
- “*Holonomy and the Einstein Equations*,” Ph.D. thesis defense at University of Pittsburgh, Pittsburgh, PA, September 30, 1993.
- “*Moving Away from Flatness*,” Physics Department colloquium at SUNY Geneseo, September 17, 1993.
- “*A Non-local Reformulation of the Einstein Equations*,” thesis topic presentation, University of Pittsburgh, Pittsburgh, PA, 1991.
- “*Neutral Resonances around 1.8 MeV in Bhabha Scattering*,” M.S.(non-thesis) dissertation at Iowa State University, Ames, IA, August 1989.

### PUBLICATIONS

- 8) **S. V. Iyer** and E. C. Hansen\*, “Strong and Weak Deflection of Light in the Equatorial Plane of a Kerr Black Hole,” submitted for publication (2009).
- 7) **S. V. Iyer** and E. C. Hansen\*, “Light’s Bending Angle in the Equatorial Plane of a Kerr Black Hole,” accepted for publication (2009).
- 6) **S. V. Iyer** and A. O. Petters, “Light’s Bending Angle due to Black Holes: From the Photon Sphere to Infinity,” *General Relativity and Gravitation*, **39** 1563-1582, (2007).
- 5) K. A. Fletcher, **S. V. Iyer** and K. F. Kinsey “Some Pivotal Thoughts on the Current Balance,” *The Physics Teacher*, **41** 280-284 (2003).

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### PUBLICATIONS (contd.)

- 4) **S. V. Iyer** and S. G. Rajeev, "A Model of Two-dimensional Turbulence Using Random Matrix Theory," *Modern Physics Letters A*, **17** 1539-1550 (2002).
- 3) **S. V. Iyer**, E. T. Newman and C. N. Kozameh, "The Vacuum Einstein Equations via Holonomy around Closed Loops on Characteristic Surfaces," *Journal of Geometry and Physics*, **19** 151-172 (1996).
- 2) E. T. Newman, C. N. Kozameh and **S. V. Iyer**, "Einstein Equations via Null Surfaces," *Acta Physica Polonica A*, **85**, 647-654 (1994).
- 1) C. N. Kozameh, E. T. Newman and **S. V. Iyer**, "Non-local Equations for General Relativity," *Journal of Geometry and Physics*, **8** 195-209 (1992).

### CONFERENCES

- American Physical Society March Meeting, University of Pittsburgh, March 16-20, 2009.
- 12th Eastern Gravity Meeting, Center for Computational Relativity and Gravitation at RIT, June 15-16, 2009.
- APS NY state section symposium titled, "Harnessing Photons: from Energy to Entanglement," at University of Rochester, April 17-18, 2009..
- Selected to attend the "Professional Skills Development," workshop organized by the Council for the Status of Women in Physics at the APS March Meeting. Also chaired the ACIPA event at this meeting, Pittsburgh, March 15-16, 2009.
- APS NY state section symposium titled, "A Century of Light and Materials," at Corning Inc. NY. Took 12 students to the conference. November 14-15, 2008
- First Anacapa Society meeting, Amherst College, Amherst, MA, January 5-6, 2008.
- "Geometric and Stochastic Lensing Workshop: Applications to Black Holes and Dark Matter," Petters Research Institute, Dangriga, Belize, January 5-12, 2007. Co-organizer and presenter.
- "Teaching General Relativity to Undergraduates," AAPT Topical Conference, Syracuse, NY, July 20-21, 2006. Presented a poster titled "General Relativity at SUNY Geneseo."
- One-week workshop titled, "Gravitational Lensing in the Kerr Spacetime Geometry," American Institute of Mathematics, Palo Alto, CA, July 11-15, 2005. Official scribe for the workshop.
- Workshop on Deliberative Dialog organized by National Issues Forum, Washington D.C., July 2004.
- Conference titled, "Peter Gabriel Bergmann Memorial Symposium," Department of Physics, Syracuse University, October 11-12, 2003.
- Conference titled, "Gravitation: A Decennial Perspective," Center for Gravitational Physics and Geometry, Penn State, June 8-12, 2003.
- New York State Symposium of the American Physical Society at SUNY Geneseo, NY, titled "Physics of Everyday Phenomena," Local organizer, April 4-5, 2003.
- New York State Symposium of the American Physical Society in Oneonta, NY, titled "Energy and Environment." Took 2 Geneseo Physics majors. April 12-13, 2002.
- "Theoretical High Energy Physics," Fall 2001 Conference, SUNY Institute of Technology, Utica, NY, October 12, 2001.
- New York State Symposium of the American Physical Society in Buffalo, NY, titled "Cosmology, Strings and Particle Physics." Took 8 Geneseo Physics majors to the conference. October 20-21, 2000.
- Third Eastern Gravity Meeting, at Cornell University, Ithaca, NY, March 26-27, 1999.
- 77th Topical Symposium of the New York State Section of the American Physical Society in Saratoga Springs, NY, titled "A Century of Modern Physics." Took 8 Geneseo Physics majors. October 17-18, 1997.
- International Congress of Mathematical Physics in Brisbane, Australia. Funded by NSF Travel Grant July 13-19, 1997.
- "Inside Windows," seminar organized by Mastering Computers, Rochester Convention Center (registration funded by the Geneseo Dept. of Physics). December 17, 1996.

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(585) 245-5540**SERVICE****PROFESSIONAL SERVICE:**

Served as NSF Mathematical Physics Review Panelist, February 28-29, 2008.  
Helped organize the Einstein Week Centennial Celebration of Relativity Theory at Duke University, Durham, September 5-10, 2005.  
Local Organizer (with the physics club office bearers) of the World Year of Physics 2005 event titled, "Einstein Symposium at Geneseo," March 31, 2005.  
Local Organizer of the APS New York State Section Symposium, titled "Physics of Everyday Phenomena," April 4-5, 2003.  
Treasurer, American Chapter of the Indian Physics Association, 2002-2009.

**DEPARTMENTAL SERVICE:**

Department Review Committee, 2008.  
Faculty Search Committee, Chair 1997-98, member 1996-97, Chair 2004-2005.  
Department Executive Committee, 2004-2006.  
Physics Club Advisor, Fall 1997-Fall 2000 and Fall 2005.  
Webmaster for the Physics Department Web Page Fall 2000-Spring 2009.  
Colloquium Speakers Coordinator, Spring 1995, 1999, Fall 2002, Spring 2004, 2006, 2008.  
Department Awards, Spring 2003-2005.  
PC Lab Maintenance and Software Coordinator, Fall 1996-Fall 2000.  
Library Representative, Fall 1996-Fall 2000, 2008.  
Department Representative to the CIT Technical Support Professional (TSP) meetings.

**COLLEGE SERVICE:**

Task Force on Curriculum Review, 2007.  
Presidential Student Scholars Committee, 2006.  
College Research Council 2003-05 and 2008.  
Deliberative Dialogue facilitator.  
Search Committees for Associate Dean 2004, and for Grants Writer 2005.  
External member on the Geological Sciences Search Committee, 2003-04 and 2006-07.  
International Student Orientation, 2004.  
Freshman Orientation, Summer 1999-2002 and 2004-2005.  
College Senate Secretary, 2004-2005.  
Faculty Advisor to USCA 1998-2000 and Shakti 2000-2004  
Delivered the Freshman Orientation Faculty Address Summer 2002.  
Ad Hoc Committee on Sabbatical Leave Fall 2000.  
Senator at Large, Six Years and Under, Undergraduate Policy Committee, 1998-2000.  
College Senator, Faculty Affairs Committee member, 1997-1998.  
Chemical Management Team, Fall 1997-1999.  
Student Health Advisory Committee, 1997-1999.  
Student Computer Access Program (SCAP) department representative.

**SERVICE RELATED TO PROFESSION:**

"Space, Time and Spacetime," Math Day at Corning Community College, October 11, 2007, October 12, 2006, October 6, 2005, October 7, 2004.  
Take Our Daughters to Work Day Program titled, "All That's Physics? No Way!" April 22, 1999.  
BOCES course titled "What is Theoretical Physics?" 13, 20 and 27, February 1997.

**OTHER****CITIZENSHIP: U.S.**