

# Curriculum Vitae: Stuart L. Shapiro

## Professional Preparation

Undergraduate Institution: Harvard University, Cambridge, MA.

Major: Astronomy Degree: A.B., Summa Cum Laude, 1969

Graduate Institution: Princeton University, Princeton, NJ.

Dept: Astrophysical Sciences Degrees: M.A., 1971; Ph.D., 1973 (Advisor: P.J.E. Peebles)

Postdoctoral Institution: Cornell University, Ithaca, NY.

Areas: theoretical astrophysics & general relativity Dates: 1973-1975

## Appointments

1996 - Professor of Physics and Astronomy, and NCSA Senior Research Scientist, University of Illinois at Urbana-Champaign.

1981 - 1995 Professor of Astronomy and Physics, Cornell University.

1978 - 1981 Associate Professor of Astronomy, Cornell University.

1975 - 1978 Assistant Professor of Astronomy, Cornell University.

## Selected Awards

1979 – Alfred P. Sloan Research Fellowship

1984 – Assoc. of American Publishers Award for physics textbook: *Black Holes, White Dwarfs & Neutron Stars: Physics of Compact Objects*

1985 – Teaching Citation (Cornell in 1985, 1988 & UIUC in 2003, 2012)

1989 – 1990 John Simon Guggenheim Memorial Foundation Fellowship

1990 – IBM Supercomputing Competition Award

1990 – Frontiers of Large-Scale Computation Award

1991 – First Prize, IBM Supercomputing Competition

1996 – Offered B. Tinsley Visiting Prof. of Astronomy, U. Texas at the University of Texas

1998 – Fellow of the American Physical Society

2004 – Fellow of the Institute of Physics (U.K.)

2017 – Hans A. Bethe Prize of the American Physical Society

**Complete Bibliography:** <https://physics.illinois.edu/people/directory/profile/slshapir>

(415 journal publications + 4 books + 55 simulation movies)

## Five Relevant Publications

*Relativistic simulations of black hole-neutron star coalescence: The jet emerges.*

V. Paschalidis, M. Ruiz, & S. L. Shapiro.

Ap. J. Lett., 806, L14/1-5 (2015)

*GW170817, general relativistic magnetohydrodynamic simulations, and the neutron star maximum mass.* M. Ruiz, S. L. Shapiro & A. Tsokaros.

Phys. Rev. D: Rapid Commun. 97, 021501/1-6 (2018)

*Relativistic radiation magnetohydrodynamics in dynamical spacetimes: Numerical methods and tests.* B. D. Farris, T. K. Li, Y. T. Liu & S. L. Shapiro.

Phys. Rev. D., 77, 084002/1-22 (2008)

*Accretion disks around binary BHs of unequal mass: GRMHD simulations of postdecoupling and merger.* R. Gold, V. Paschalidis, M. Ruiz, S. L. Shapiro, Z. B. Etienne, & H. P. Pfeiffer.

Phys. Rev. D., 90, 104030/1-14 (2014)

*Gravitational waves from disks around spinning black holes: Simulations in full general relativity.*  
E. Wessel, V. Paschalidis, A. Tsokaros, M. Ruiz and S. L. Shapiro.  
Phys. Rev. D., 103, 043013/1-15 (2021)

### **Five Significant Publications**

**Textbook:** *Black holes, white dwarfs and neutron stars: The physics of compact objects.*  
S. L. Shapiro, & S. A. Teukolsky.  
(John Wiley, New York), 645 pgs (1983)

**Textbook:** *Numerical relativity: Solving Einstein's equations on the computer.*  
T. W. Baumgarte, & S. L. Shapiro.  
(Cambridge University Press, Cambridge), 720 pgs (2010)

**Textbook:** *Numerical relativity: Starting from scratch.*  
T. W. Baumgarte, & S. L. Shapiro.  
(Cambridge University Press, Cambridge), 220 pgs (2021)

*Numerical integration of Einstein's field equations.* T. W. Baumgarte, & S. L. Shapiro.  
Phys. Rev. D, 59, 24007/1-7 (1998) [BSSN]

*Relativistic magnetohydrodynamics in dynamical spacetimes: A new adaptive mesh refinement implementation.* Z. B. Etienne. Y T. Liu & S. L. Shapiro.  
Phys. Rev. D., 82, 084031/1-21 (2010) [Illinois GRMHD code].

### **Selected Professional Experiences and Synergistic Activities**

**Involvement of undergraduates in research:** supervises a team of six undergraduates in theoretical astrophysics and GR, with focus on numerical GR simulations, data analysis and visualization.

**Innovative teaching:** developed four new courses for advanced undergraduates and beginning graduate students – GR, the physics of compact objects, computational physics and astrophysics (with numerical lab), and stellar dynamics – and co-authored three accompanying textbooks.

**Promoting public scientific interest and literacy:** Proposed and launched the Icko Iben, Jr. Distinguished Public Lecture Series in the UIUC Department of Astronomy and participated in the Saturday Physics Honors Program in the UIUC Department of Physics to communicate to high school students and their teachers and the broader public the latest advances and discoveries in GR and astrophysics. Maintain GR group web page (with movies): <http://tinyurl.com/shapiromovies>.

**Professional Service:** Associate editor, *ApJ Letters* (1987-1990) and Editorial Board, *International Journal of Modern Physics C (IJMPC)*, *Physics and Computers* (1990-1995) and *Classical & Quantum Gravity* (2003-2009). Co-chair, Panel on Infrastructure Issues for Computational Science, NRC of the NAS (1993). Task Group, Gravity Probe-B, Space Studies Board, NRC of the NAS (1995). Chair, Compact Objects Proposal Selection Panel, NASA Astrophysics Theory Program (ATP;1995). LISA Mission Definition Advisory Team, NASA (1991-2001). CAREER Awards Panel, Division of Physical Sciences, NSF (2004). UIUC Physics search committee targeting women & underrepresented groups for a tenure-track position in gravitational physics (2019).

**Refinement of software tools for community:** co-developed the BSSN scheme for numerical relativity and the Illinois GRMHD AMR code (now an open-source module in the Einstein Toolkit).

**Grants and Student Training:** PI on NASA ATP grants since program inception and PI on individual investigator NSF grants since 1977. Co-I on *NSF Binary Black Hole Grand Challenge* and *ITR:MHD Simulations in GR* projects. PhD advisor to 18 graduate students and supervisor of 38 postdoctoral students, all participants in multiple collaborative projects and publications.