Fred Rasio – Short CV

Education

Université Libre de Bruxelles, Belgium: Engineering Physics M.S. (1985), *Avec Grande Distinction.*

Cornell University, Ithaca, New York: Physics M.S. (1988) and Ph.D. (1991).

Appointments

2013– Lead Editor, The Astrophysical Journal Letters.

2009– Joseph Cummings Professor of Physics, Northwestern University.

2009–2012 Founding Co-Director, Center for Interdisciplinary Exploration and Research in Astrophysics, Northwestern University (CIERA).

2001– Associate Professor, Professor, Department of Physics and Astronomy, Northwestern University.

1995–2002 Assistant Professor, Associate Professor, Department of Physics, MIT.

1992–1995 Postdoctoral Fellow, School of Natural Sciences, Institute for Advanced Study, Princeton.

Awards and Honors

2025 Elected Fellow of the American Academy of Arts and Sciences.

2020 Legacy Fellow of the American Astronomical Society.

2019 Brouwer Career Award (American Astronomical Society, Division of Dynamical Astronomy).

2018 AAAS Fellow (American Association for the Advancement of Science).

2018 Salpeter Lecturer (Cornell University, College of Arts & Sciences).

2006–2007 Research Mentor Award (Northwestern University, Weinberg College of Arts and Sciences).

2006 Fellow of the American Physical Society.

1996–2000 Sloan Research Fellow (Alfred P. Sloan Foundation).

1992–1995 Hubble Fellow (NASA).

Administration and Service

Northwestern University, Weinberg College of Arts and Sciences: Tenure Committee (2016–2019); Committee on Appeals (2006–2011); Interdisciplinary Committee on Evolutionary Processes (2005–2011); Integrated Science Program Committee (2001–), multiple Dean's ad hoc committees.

Northwestern University, The Graduate School: Member of the Administrative Board (2006–2012).

Northwestern University, Department of Physics and Astronomy: served as Director of Graduate Studies (2006–2008, 2016–2018), and multiple years on the Executive Committee, Graduate Curriculum Committee, Colloquium Committee, Long-Term Planning Committee, Heilborn Lectures Committee, and multiple hiring and promotion committees.

Northwestern University, Center for Interdisciplinary Exploration and Research in Astrophysics (CIERA): served as Founding Co-Director (2009–2012), and multiple years on the CIERA Fellowship Selection Committee, and Colloquium Committee.

Aspen Center for Physics: General Member (2009–2019), Honorary Member (2019–); served as Assistant Scientific Secretary (2017-18), Scientific Secretary (2018-19), and on the Summer Program Committee, Summer Admissions Committee, Nominations Committee, and Colloquium Committee.

University of California, Santa Barbara, Kavli Institute for Theoretical Physics: Member of the Advisory Board (2015–2019; Co-Chair, 2017-18).

American Astronomical Society: Employment Committee (2004–2012; Chair 2010-11), Warner Prize and Pierce Prize Committee (2009–2011), and several committees for the Division on Dynamical Astronomy (DDA).

Conference Organization: main co-organizer or SOC member for over 50 national or international meetings since 1998. Most notable: *Extreme Solar Systems* I – V (main organizer for this series of large international meetings on exoplanets); many Aspen Center for Physics Summer Programs and Winter Conferences, and several KITP Programs at UC Santa Barbara.

Proposal peer reviewer or review panel member/chair for: US NSF, DOE, and NASA; European Research Council; Austrian Science Fund; Chilean CONICYT; Israel Science Foundation; French Agence Nationale de la Recherche; German DFG and Max Planck Society; Dutch NWO; Canadian NSERC and Canada Research Chairs Program; UK PPARC and Royal Society; Polish National Science Centre; Hong Kong Research Grants Council.

Peer reviewer for The AAS Journals (ApJ, ApJL, ApJS, AJ), Astronomy & Astrophysics, Icarus, Monthly Notices of the Royal Astronomical Society, Nature, Science, Physical Review D, Physical Review Letters.

Teaching and Mentoring

Northwestern Department of Physics and Astronomy: Phys 110, Freshman Seminar (*From Copernicus to Hawking: the People and Ideas that Shaped Modern Cosmology; Origins: from Big Bang Cosmology to Astrobiology; The Physics of Armageddon; Einstein's Outrageous Legacy; The Astrophysics of Alien Worlds*); Phys 125-1, *Physics for ISP*; Phys 135, *General Physics*; Astron 331, *Astrophysics for ISP*; Phys 345, *Introduction to General Relativity*; Astron 390-JR, Junior Research Seminar on *Astrobiology*; Astron 449, *Stellar Dynamics*; Phys 445-1,2, *General Relativity*.

MIT Department of Physics: 8.03, *Physics III (Vibrations and Waves)*; 8.901, *Astrophysics I (Graduate Astrophysics)*; several freshman advising seminars.

Mentoring: directly supervised 18 PhD students, and mentored about 20 postdocs since 1995 at MIT and Northwestern.

Publications

As of October 2026, total number of entries on NASA ADS: 440; total number of refereed publications: 220; total citations: 25,931; average citations per refereed paper: 114; h-index: 86.

Twenty most cited papers:

Dynamical Instabilities and the Formation of Extrasolar Planetary Systems [1,076 citations]. Rasio, F.A., & Ford, E.B. 1996, *Science*, **274**, 954–956.

Dynamical Outcomes of Planet–Planet Scattering [854 citations]. Chatterjee, S., Ford, E.B., Matsumura, S., & Rasio, F.A. 2008, *Astrophysical Journal*, **686**, 580–602.

Compact Object Modeling with the StarTrack Population Synthesis Code [766 citations]. Belczynski, K., Kalogera, V., Rasio, F.A., Taam, R.E., Zezas, A., Bulik, T., Maccarone, T.J., & Ivanova, N. 2008, *Astrophysical Journal Supplement Series*, **174**, 223–260.

Binary Black Hole Mergers from Globular Clusters: Masses, Merger Rates, and the Impact of Stellar Evolution [600 citations]. Rodriguez, C.L., Chatterjee, S., & Rasio, F.A. 2016, *Physical Review D*, **93**, id.084029.

Hot Jupiters from Secular Planet–Planet Interactions [492 citations]. Naoz, S., Farr, W.M., Lithwick, Y., Rasio, F.A., & Teyssandier, J. 2011, *Nature*, **473**, 187–189.

Origins of Eccentric Extrasolar Planets: Testing the Planet–Planet Scattering Model [445 citations]. Ford, E.B., & Rasio, F.A. 2008, *Astrophysical Journal*, **686**, 621–636.

Merging Black Hole Binaries in Galactic Nuclei: Implications for Advanced-LIGO Detections [443 citations]. Antonini, F., & Rasio, F.A. 2016, *Astrophysical Journal*, **831**, 187.

Binary Black Hole Mergers from Globular Clusters: Implications for Advanced LIGO [420 citations]. Rodriguez, C.L., Morscher, M., Pattabiraman, B., Chatterjee, S., Haster, C., & Rasio, F.A. 2015, *Physical Review Letters*, **115**, 051101.

Secular Dynamics in Hierarchical Three-Body Systems [420 citations]. Naoz, S., Farr, W.M., Lithwick, Y., Rasio, F.A., & Teyssandier, J. 2013, *Monthly Notices of the Royal Astronomical Society*, **431**, 2155–2171.

Secular Evolution of Hierarchical Triple Star Systems [413 citations]. Ford, E.B., Kozinsky, B., & Rasio, F.A. 2000, *Astrophysical Journal*, **535**, 385–401.

Tidal Decay of Close Planetary Orbits [412 citations]. Rasio, F.A., Tout, C.A., Lubow, S.H., & Livio, M. 1996, *Astrophysical Journal*, **470**, 1187.

Collapse of Primordial Gas Clouds and the Formation of Quasar Black Holes [406 citations]. Loeb, A., & Rasio, F.A. 1994, *Astrophysical Journal*, **432**, 52.

Formation of Massive Black Holes in Dense Star Clusters. I. Mass Segregation and Core Collapse [390 citations]. Gürkan, M.A., Freitag, M., & Rasio, F.A. 2004, *Astrophysical Journal*, **604**, 632–652.

Black Holes: The Next Generation—Repeated Mergers in Dense Star Clusters and Their Gravitational-Wave Properties [363 citations]. Rodriguez, C.L., Zevin, M., Amaro-Seoane, P., Chatterjee, S., Kremer, K., Rasio, F.A., & Ye, C.S. 2019, *Physical Review D*, **100**, 043027.

Post-Newtonian Dynamics in Dense Star Clusters: Highly Eccentric, Highly Spinning, and Repeated Binary Black Hole Mergers [354 citations]. Rodriguez, C.L., Amaro-Seoane, P., Chatterjee, S., & Rasio, F.A. 2018, *Physical Review Letters*, **120**, 151101.

Illuminating Black Hole Binary Formation Channels with Spins in Advanced LIGO [353 citations]. Rodriguez, C.L., Zevin, M., Pankow, C., Kalogera, V., & Rasio, F.A. 2016, *Astrophysical Journal Letters*, **832**, L2.

Stellar Collisions During Binary–Binary and Binary–Single Star Interactions [351 citations]. Fregeau, J.M., Cheung, P., Portegies Zwart, S.F., & Rasio, F.A. 2004, *Monthly Notices of the Royal Astronomical Society*, **352**, 1–19.

COSMIC Variance in Binary Population Synthesis [350 citations]. Breivik, K., Coughlin, S., Zevin, M., Rodriguez, C.L., Kremer, K., Ye, C.S., Andrews, J.J., Kurkowski, M., Digman, M.C., Larson, S.L., & Rasio, F.A. 2020, *Astrophysical Journal*, **898**, 71.

Binary Mergers and Growth of Black Holes in Dense Star Clusters [314 citations]. O'Leary, R.M., Rasio, F.A., Fregeau, J.M., Ivanova, N., & O'Shaughnessy, R. 2006, *Astrophysical Journal*, **637**, 937–951.

Black Hole Mergers in Galactic Nuclei Induced by the Eccentric Kozai-Lidov Effect [310 citations]. Hoang, B.-M., Naoz, S., Kocsis, B., Rasio, F.A., & Dosopoulou, F. 2018, *Astrophysical Journal*, **856**, 140.

Funding

Over $12M in total research funding as PI or co-PI through grants from NASA and NSF since 1998.

A Seismic Atlas of the Stellar Merger Sky. Hubble Fellowship grant supporting Dr. Nicholas Rui, Rasio, F.A. (P.I.), NASA Grant HST-HF2-51589.002-A from Space Telescope Science Institute, $157,769 awarded for 09/2026 – 08/2028.

Modeling Dense Star Clusters from Cosmic Dawn to the Present. Rasio, F.A. (P.I.), & Starkenburg, T. (co-P.I.), NSF Grant AST-2511543, $587,631 awarded for 09/2025 – 08/2028.

MRI: Track 1 – Acquisition of a Hybrid, High-Performance Computing Cluster for Gravitational-Wave Data Analysis and Source Interpretation. Kalogera, V. (P.I.), Rasio, F.A. (co-P.I.), et al., NSF Grant PHY-2406802, $491,136 awarded for 08/2024 – 07/2026.

Stellar Dynamics and Stellar Collisions in Star-by-star Models of Nuclear Star Clusters. Rodriguez, C.L. (UNC, P.I.), Rasio, F.A. (co-P.I.), NASA Astrophysics Theory Program Grant NNX14AP92G, $316,531 awarded (to Northwestern) for 04/2022 – 03/2026.

Gravitational Wave Sources from Dense Star Clusters. Rasio, F.A. (P.I.), & Fragione, G. (co-P.I.), NSF Grant AST-2108624, $497,967 awarded for 09/2021 – 08/2025.

Preparing LISA for Intermediate-Mass Black Hole Science, Fragione, G. (P.I.), Rasio, F.A. (co-I), et al., NASA LISA Preparatory Science Grant 80NSSC21K1722, $709,671 awarded for 09/2021 – 09/2024.

MRI: Acquisition of a High-Performance Computing Cluster to Unveil the Sources of Gravitational Waves. Kalogera, V. (P.I.), Rasio, F.A. (co-P.I.), et al., NSF Grant PHY-1726951, $349,924 awarded for 08/2017 – 07/2019.

Black Holes in Dense Star Clusters. Rasio, F.A. (P.I.), Chatterjee, S. (co-P.I.), & Kalogera, V. (co-P.I.), NSF Grant AST-1716762, $468,070 awarded for 06/2017 – 05/2020.

Identifying Globular Clusters Hosting Large Numbers of Black Holes. Chatterjee, S. (P.I.), & Rasio, F.A. (co-I.), NASA Hubble Space Telescope Grant HST-AR-14555.001, $79,999 awarded for 1/2017 – 12/2019.

Dynamical Modeling of Dense Star Clusters with a Parallel Monte Carlo Code. Rasio, F.A. (P.I.), NASA Astrophysics Theory Program Grant NNX14AP92G, $450,000 awarded for 09/2014 – 08/2018.

Gamma-ray Emission from the Galactic Center: Constraining the Millisecond Pulsar Population. Antonini, F. (P.I.), Rasio, F.A. (Co-I.), et al., NASA Fermi Grant NNX15AU69G, $75,000 awarded for 11/2015 – 10/2017.

Fellows on the Frontier 2015. Rasio, F.A. (P.I.), NSF Conference Grant AST-1518974, $27,520 awarded for 07/2015 – 06/2017.

REU Site: Preparing a Diverse Workforce through Interdisciplinary Astrophysics Research. Kalogera, V. (P.I.), Rasio, F.A. (co-P.I.), et al., NSF Grant AST-1359462, $287,785 awarded for 9/2014 – 8/2017.

CDS&E: Black Holes in Dense Star Clusters. Rasio, F.A. (P.I.), et al., NSF CDS&E Grant AST-1312945, $448,377 awarded for 09/2013 – 08/2017.

Modeling Black Hole X-Ray Binaries in Globular Clusters. Chatterjee, S. (Science P.I.), Rasio, F.A. (P.I.), NASA Chandra Theory Grant TM5-16004X//NAS8-03060, $85,000 awarded for 03/2015 – 2/2017.

Dynamics of Extrasolar Planetary Systems. Rasio, F.A. (P.I.), NASA OSS Grant NNX12AI86G, $537,110 awarded for 05/2012 – 05/2016.

New Insights on Open Cluster Dynamics and Neutron Star Formation. Geller, A. (Science P.I.), Rasio, F.A. (P.I.), NASA Grant GO3-14043B//NAS-8-03060 from Smithsonian Astrophysical Observatory, $9,981 awarded for 08/2013 – 08/2015.

Weather on Substellar Worlds: Mapping the Atmospheres of Cool Brown Dwarfs. Cowan, N. (Science P.I.), Rasio, F.A. (P.I.), NASA Spitzer Grant RSA-1442438 from Jet Propulsion Laboratory, $50,000 awarded for 09/2012 – 09/2014.

Modeling the Blue Stragglers in Globular Clusters. Chatterjee, S. (P.I.), & Rasio, F.A. (co-I.), NASA Hubble Space Telescope Grant HST-AR-12829.01-A, $59,000 awarded for 09/2012 – 09/2014.

Planetary Atmospheres in Extreme Environments. Cowan, N. (Science P.I.), Rasio, F.A. (P.I.), NASA Spitzer Grant RSA-1442438 from Jet Propulsion Laboratory, $50,000 awarded for 09/2011 – 09/2014.

Formation of Black Hole X-Ray Binaries in Globular Clusters. Umbreit, S. (Science P.I.), Rasio, F.A. (P.I.), NASA Chandra Theory Grant TM1-12006X from Smithsonian Astrophysical Observatory, $85,000 awarded for 01/2011 – 12/2013.

Balancing the Budget: Simultaneous Near- and Mid-IR Phase Curves of WASP12b. Cowan, N. (Science P.I.), Rasio, F.A. (P.I.), NASA Spitzer Grant RSA-1420463 from Jet Propulsion Laboratory, $47,500 awarded for 11/2010 – 09/2013.

MRI: Acquisition of a Hybrid High Performance Computer Cluster for Gravitational-Wave Source Simulation and Data Analysis. Kalogera, V. (P.I.), Rasio, F.A. (co-P.I.), et al., NSF Grant PHY-1126812, $475,000 awarded for 09/2011 – 08/2012.

Eccentric Disks around Supermassive Black Holes. Hubble Fellowship grant supporting Dr. Evghenii Gaburov, Rasio, F.A. (P.I.), NASA Grant HST-HF-51289.01-A from Space Telescope Science Institute, $110,023 awarded for 09/2011 – 08/2012.

Dynamical Formation and Evolution of Compact Binaries. Rasio, F.A. (P.I.), NSF Grant PHY-0855592, $229,106 awarded for 08/2009 – 07/2012.

Binary Stars and Globular Cluster Dynamics. Rasio, F.A. (P.I.), NASA Astrophysics Theory Program Grant NNX09AO36G, $470,721 awarded for 08/2009 – 07/2012.

Hydrodynamics of Stellar Collisions and Mergers. Rasio, F.A. (P.I.), NASA Astrophysics Theory Program Grant NNX08AG66G, $416,923 awarded for 03/2008 – 03/2012.

Intermediate-Mass Black Holes in Globular Clusters. Umbreit, S. (Science P.I.), Rasio, F.A. (P.I.), NASA Hubble Theory Grant HST-AR-11779.01-A, from Space Telescope Science Institute, $85,000 awarded for 11/2008 – 10/2010.

Dynamical Formation and Evolution of Compact Binaries. Rasio, F.A. (P.I.), NSF Grant PHY-0601995, $197,996 awarded for 08/2006 – 07/2010.

Intermediate-Mass Black Holes in Galactic Nuclei and Starbursts. Rasio, F.A. (P.I.), & Freitag, M. (co-P.I.), NSF Grant AST-0607498, $364,598 awarded for 06/2006 – 05/2010.

Observational Signatures of Extrasolar Late Heavy Bombardments. Thommes, E. (Science P.I.), Rasio, F.A. (P.I.), NASA Spitzer Theory Grant NMO710076, from Caltech Jet Propulsion Laboratory, $86,144 awarded for 07/2007 – 06/2009.

Binary Stars and Globular Cluster Dynamics. Rasio, F.A. (P.I.), NASA Astrophysics Theory Program Grant NNG06GI62G, $331,919 awarded for 05/2006 – 04/2009.

Acquisition of a Versatile High Performance Computing Facility for Gravitational Wave Source Modeling and Student Training. Kalogera, V. (P.I.), Rasio, F.A. (co-P.I.), et al., NSF MRI Grant PHY-0619274, $416,198 awarded for 10/2006 – 09/2008.

Modeling Stellar Exotica in Dense Star Clusters. Lombardi, J.C. (P.I.), & Rasio, F.A. (co-P.I.), NSF Grant AST-0507561, $177,563 awarded for 09/2005 – 08/2008.

Dynamical Formation of X-ray Sources in Dense Star Clusters. Fregeau, J.A. (Science P.I.), Rasio, F.A. (P.I.), NASA Chandra Fellowship Grant PF7-80047, from Smithsonian Astrophysical Observatory, $88,682 awarded for 08/2007 – 07/2008.

Dynamics of Extrasolar Planetary Systems. Rasio, F.A. (P.I.), NSF Grant AST-0507727, $397,336 awarded for 08/2005 – 07/2008.

Conference on 'Extreme Solar Systems'. Rasio, F.A. (P.I.), & Wolszczan, A. (co-P.I.), NSF Grant AST-0732444, $26,000 for 07/2007 – 06/2008.

Millisecond Pulsars and Core Collapse in the Globular Cluster NGC 6752. Heinke, C.O. (Science P.I.), Rasio, F.A. (P.I.), NASA Chandra GO Grant GO6-7034X from Smithsonian Astrophysical Observatory, $38,998 awarded for 02/2006 – 02/2008.

Dynamical Formation of X-ray Sources in Globular Clusters. Fregeau, J.A. (Science P.I.), Rasio, F.A. (P.I.), NASA Chandra Theory Grant TM6-7007X from Smithsonian Astrophysical Observatory, $78,986 awarded for 01/2006 – 12/2007.

Stellar Collisions in Dense Star Clusters and Galactic Nuclei. Rasio, F.A. (P.I.), NASA Astrophysics Theory Program Grant NNG04G176G, $310,000 awarded for 05/2004 – 05/2007.

Hydrodynamic Calculations of Coalescing Compact Binaries. Rasio, F.A. (P.I.), NSF Grant PHY-0245028, $116,000 awarded for 08/2003 – 07/2006.

Dynamics of Extrasolar Planetary Systems. Rasio, F.A. (P.I.), NSF Grant AST-0206182, $227,376 awarded for 07/2002 – 06/2006.

Binary Stars and Globular Cluster Dynamics. Rasio, F.A. (P.I.), NASA Astrophysics Theory Program Grant NAG5-12044, $259,770 awarded for 04/2002 – 04/2006.

Stellar Sources of Low-Frequency Gravitational Waves. Kalogera, V. (P.I.), Freitag, M. (co-I.), & Rasio, F.A. (co-I.), NASA Astrophysics Theory Program Grant NAG5-12345, $253,762 awarded for 04/2003 – 03/2006.

Collaborative Research: Stellar Collisions and Mergers. Rasio, F.A. (P.I.), NSF Grant AST-0206276, $50,244 awarded for 09/2002 – 08/2005.

Theoretical Models of X-ray Binaries and Millisecond Pulsars in Globular Clusters. Rasio, F.A. (P.I.), NASA Chandra Theory Grant TM3-4003X from Smithsonian Astrophysical Observatory, $60,000 awarded for 01/2003 – 12/2004.

Hydrodynamic Calculations of Coalescing Compact Binaries. Rasio, F.A. (P.I.), NSF Grant PHY-0133425, $124,353 awarded for 08/2001 – 07/2004.

Binary Stars and Globular Cluster Dynamics. Rasio, F.A. (P.I.), NASA Astrophysics Theory Program Grant NAG5-11396, $77,049 awarded for 07/2001 - 04/2002.

Binary Stars and Globular Cluster Dynamics. Rasio, F.A. (P.I.), NASA Astrophysics Theory Program Grant NAG5-8460, $242,278 awarded for 04/1999 - 04/2002.

Evolution and Stellar Dynamics in Dense Star Clusters. Rasio, F.A. (P.I.), NASA Hubble Fellowship Grant HF-01112.01-98A (to support S. Portegies Zwart at MIT), $202,000 awarded for 11/1998 – 10/2001.

Hydrodynamic Calculations of Coalescing Compact Binaries. Rasio, F.A. (P.I.), NSF Grant PHY-0070918, $56,670 awarded for 08/2000 – 07/2001.

Theoretical Studies of Dynamical Interactions between Stars. Rasio, F.A. (P.I.), NSF Grant AST-9618116, $214,570 awarded for 05/1997 – 04/2001.

Sloan Research Fellowship, Alfred P. Sloan Foundation, $35,000 awarded for 10/1996 – 09/2000.

Gas Dynamics and the Formation of Galaxies and Quasars. Loeb, A. (P.I.), & Rasio, F.A. (co-I.), NASA Astrophysics Theory Program Grant NAG5-3085, $240,000 awarded for 08/1995 – 07/1998.