

ANDREW J. BAKER

Department of Physics and Astronomy
Rutgers, the State University of New Jersey
136 Frelinghuysen Road
Piscataway, NJ 08854-8019

Phone: (848) 445-8887
Fax: (732) 445-4343
Email: [ajbaker\[at\]physics.rutgers.edu](mailto:ajbaker[at]physics.rutgers.edu)
<http://www.physics.rutgers.edu/~ajbaker/>

Appointments

2017 – Professor
2012 – 2017 Associate professor
2006 – 2012 Assistant professor
Department of Physics and Astronomy, Rutgers University

2022 – Extraordinary professor
Department of Physics and Astronomy, University of the Western Cape

2016 – 2017 Member, Defense Science Study Group

2004 – 2006 Jansky Fellow (National Radio Astronomy Observatory)
Department of Astronomy, University of Maryland

2000 – 2004 Postdoctoral researcher (infrared/submillimeter astronomy group)
Max-Planck-Institut für extraterrestrische Physik

Education

1994 – 2000 Ph.D. in Astronomy, California Institute of Technology
1990 – 1994 A.B. *cum laude* in Mathematics and Physics, Harvard University

Honors

2024 Fellowship, American Astronomical Society
2023 – 2024 Radcliffe Fellowship, Harvard Radcliffe Institute
2020 SGS Dean's Advisory Council Award for the Mentoring of Graduate Students
2019 Warren I. Susman Award for Excellence in Teaching
2015 – 2016 Fulbright Scholarship (South Africa)
2015 Fellowship, American Association for the Advancement of Science
2012 Presidential Fellowship for Teaching Excellence
2010 SAS Award for Distinguished Contributions to Undergraduate Education
2010 Society of Physics Students Outstanding Teacher Award
2010 National Science Foundation CAREER Award
1995 – 1998 National Science Foundation Graduate Research Fellowship

Teaching

Physics 109 (Astronomy and Cosmology: The Solar System): Fall 2013–14, 2018, 2021
Physics 110 (Astronomy and Cosmology: Stars, Galaxies, and the Universe): Spring 2021
Physics 343 (Observational Radio Astronomy): Spring 2008–09, 2011–19
Physics 343 (Observational Astronomy): Spring 2020
Physics 442 (High Energy Astrophysics and Radiative Processes): Fall 2022
Physics 443 (Galaxies and the Milky Way): Spring 2023
Physics 607 (Galaxies and Galaxy Dynamics): Spring 2022

Physics 610 (Interstellar Matter): Spring 2007, 2010; Fall 2012, 2017

Physics 629 (Observational Techniques): Fall 2007, 2010

School of Arts and Sciences Honors Seminar (Extraterrestrial Life): Fall 2008, 2011, 2019

Byrne Seminar (Radio Astronomy: Jersey Roots, Global Reach): Fall 2012–14; Spring 2017

Byrne Seminar (The Poetry of Astronomy), with C. Williams: Spring 2016, 2018–19

Byrne Seminar (Launching Your Successful STEM Career), with C. Keeton: Fall 2017–19

Research mentorship

Graduate students (15):

- 2023 – Cristian Garcia-Vanegas (Rutgers University)
- 2023 – Mika Naidoo (University of the Witwatersrand)
 - co-supervised with R. Deane & S. Makhathini (Wits University)
- 2022 – Derek Zapata (Rutgers University)
- 2019 – Nandrianina Randriamiarinarivo (University of the Western Cape)
 - co-supervised with E. Elson & R. Maartens (University of the Western Cape)
- 2019 – Amir Kazemi-Moridani (Rutgers University)
- 2017 – 2023 Dr. Anthony Young (Rutgers University)
- 2013 – 2019 Dr. John Wu (Rutgers University)
- 2012 – 2019 Dr. Jesus Rivera (Rutgers University)
- 2011 – 2014 Dr. Amitpal Tagore (Rutgers University)
 - co-supervised with C. Keeton (Rutgers)
- 2009 – 2010 Dr. Ross Fadely (Rutgers University)
 - co-supervised with C. Keeton (Rutgers)
- 2009 – 2013 Dr. Robert Lindner (Rutgers University)
- 2008 – 2013 Dr. Chelsea Sharon (Rutgers University)
- 2008 – 2012 Dr. Paula Aguirre (Pontificia Universidad Católica)
 - co-supervised with L. Infante (Católica)
- 2004 – 2010 Dr. Lisa Wei (University of Maryland)
 - co-supervised with S. Vogel (Maryland) & S. Kannappan (North Carolina)
- 2004 – 2005 Dr. Giovanni Cresci (Arcetri Observatory & MPI für extraterrestrische Physik)
 - co-supervised with F. Mannucci (Arcetri), R. Davies, & M. Lehnert (MPE)

Undergraduate students (33):

- 2023 – Samuel Carlos (New Jersey Institute of Technology/REU)
- 2022 – 2023 Sridhar Kumar (Rutgers University)
- 2021 – 2022 Frederick Jackson (Jackson State University/REU)
- 2021 – 2022 Michael Wozniak (Rutgers University)
- 2020 Joseph Barr (Rutgers University)
 - co-supervised with C. Keeton (Rutgers)
- 2019 Steve Deonarine (Rutgers University)
 - co-supervised with C. Keeton (Rutgers)
- 2018 – 2019 Anthony Tenorio-Coronel (Rutgers University)
 - co-supervised with C. Keeton (Rutgers)
- 2018 – 2019 Marcell Howard (Case Western Reserve University/REU)
- 2017 – 2020 Antoine Washington (Rutgers University)

2017 – 2018	Michael Makmur (Rutgers University) – co-supervised with R. Somerville (Rutgers)
2016 – 2017	Manuel Perez III (University of Redlands/REU)
2016	Isaiah Harrison (Rutgers University)
2016 – 2017	Madhura Khandekar (Rutgers University)
2016 – 2017	Waleed Qawasmi (Rutgers University)
2015	Sabrina Appel (Reed College/REU)
2014	Adrian Meyers (Columbia University/REU)
2013	Dr. Kirsten Hall (University of North Carolina/RISE/REU)
2013 – 2015	Dr. John Tamasas (Rutgers University)
2012 – 2014	Peter Chi (Rutgers University)
2012 – 2015	Dr. Asher Wasserman (Rutgers University) – co-supervised with S. Kannappan (North Carolina)
2012	Dr. Megan Jones (University of Wisconsin) – co-supervised with M. Bershadsky & E. Wilcots (Wisconsin)
2011 – 2012	Dr. Benjamin Forrest (Rutgers University)
2011	Dr. Lexi René (Brooklyn College/RISE)
2010 – 2011	Dr. Chang Hoon Hahn (Rutgers University)
2010 – 2011	Timothy Conklin (Rutgers University)
2010	Bruno Pinto (Hunter College/RISE)
2009	Whitney Kropat (University of Washington/RISE)
2009 – 2012	Dr. Kiersten Ruisard (Rutgers University)
2008 – 2010	Dr. Edward Lochocki (Rutgers University)
2008 – 2009	Dr. Gautam Jain (Rutgers University)
2008 – 2009	Dr. Adam Tomczak (Rutgers University) – co-supervised with C. Keeton (Rutgers)
2008	Dr. Stephen Sirisky (Rutgers University)
2006 – 2008	Ilene Mitchell (Rutgers University) – co-supervised with K. O’Neil (NRAO)

Ten of eleven undergraduates from outside Rutgers participated in the physics and astronomy Research Experiences for Undergraduates (REU) program and/or the broader Research Intensive Summer Experience (RISE) program at Rutgers. Of the 22 Rutgers undergraduates, seven wrote honors theses (Forrest, Hahn, Kumar, Makmur, Tomczak, Washington, Wasserman) and three won Goldwater Scholarships (Lochocki, Ruisard, Wasserman).

Publications

148 refereed papers (published or in press) have gained 9739 citations, for an h index of 53 and an m index (h divided by years since first publication) of 2.21. One co-edited conference proceedings: *From Z-Machines to ALMA: (Sub)millimeter Spectroscopy of Galaxies* (2007, eds. Baker, Glenn, Harris, Mangum, & Yun, Astronomical Society of the Pacific Conference Series, Volume 375).

Grants

Awarded \$3000 of internal research funding, \$8433 of external education/outreach funding, and \$3,178,188 of external research funding. Most significant (\geq \$100,000) grants:

2023 – 2026	“LADUMA: Reaching the Highest Redshifts with the...” NSF, Astronomy & Astrophysics (PI)	\$391,606
2018 – 2023	“Collaborative Research: Observing the Cosmic Evolution of...” NSF, Astronomy & Astrophysics (PI)	\$336,900
2017 – 2022	“Strong Gravitational Lensing at High Spectral Resolution” NSF, Astronomy & Astrophysics (Co-PI; PI = C. Keeton)	\$306,354
2016 – 2023	“REU Site: Physics and Astronomy Research at Rutgers” NSF, Physics, Astronomy, & Materials REU (PI)	\$299,392
2013 – 2017	“REU Site: Physics and Astronomy at Rutgers: The On-Ramp at...” NSF, Physics & Astronomy REU (PI)	\$272,594
2010 – 2019	“The Cosmic Evolution of Dense Gas in Star-Forming Galaxies” NSF, CAREER (PI)	\$736,222
2008 – 2011	“NICMOS imaging of submillimeter galaxies...” <i>Hubble Space Telescope</i> , Cycle 16 observing (PI)	\$101,509
2007 – 2012	“Nowhere Left to Hide: Closing in on Dusty Galaxies...” NSF, Astronomy & Astrophysics (PI)	\$291,912

Scientific talks

30 colloquia, 27 invited conference talks, 28 contributed conference talks, one invited review (“30 Years of IRAM” conference in Grenoble, France), one set of invited lectures (TIARA Winter School in Hsinchu, Taiwan), one invited discussion, and 60 additional seminars at external institutions. Outreach efforts include 43 talks to high school, college, and general public audiences.

Professional service (selected)

2022 –	Committee on Astronomy and Public Policy (co-chair, 2023–present) American Astronomical Society
2022 –	ngVLA Science Advisory Council (Executive Committee)
2021 – 2022	NRAO Time Allocation Committee (4 proposal cycles) NRAO Science Review Panel (chair, semesters 21B–23A) NGA = Normal galaxies
2020 – 2021	Nominating Committee, Association of Universities for Research in Astronomy
2019 – 2021	Panel on Radio/Millimeter/Submillimeter Observations from the Ground (chair) Astro2020: the Astronomy and Astrophysics Decadal Survey
2019 –	Board of Directors, Association of Universities for Research in Astronomy
2019	ALMA International Visiting Committee
2019	Committee of Visitors, NSF Division of Physics
2017 – 2019	MIAPP programme organizing committee (corresponding coordinator) “Galaxy Evolution in a New Era of HI Surveys”
2017	Very Large Array Sky Survey critical design review panel
2015	Very Large Array Sky Survey community review panel (chair)

- 2014 – 2015 Scientific and local organizing committees (co-chair & chair)
 2015 SKA Pathfinder H I Science Coordination Committee workshop
- 2014 – 2023 Member representative, Association of Universities for Research in Astronomy
- 2013 – 2015 National executive committee and local organizing committee
 APS Conference for Undergraduate Women in Physics (CUWiP)
- 2013 – 2014 NRAO Time Allocation Committee (4 proposal cycles; chair, semesters 14A–15A)
 NRAO Science Review Panel (chair, semesters 13B–15A)
 NGA = Normal galaxies
- 2011 – Square Kilometre Array [international] H I Galaxy Science Working Group
- 2011 – 2012 NRAO Science Review Panel (4 proposal cycles)
 HIZ = High redshift and source surveys
- 2011 – 2014 ALMA Review Panel (Cycles 0–2; deputy chair, Cycles 1–2)
- 2009 – 2010 Science Frontier Panel on “Galaxies across Cosmic Time”
 Astro2010: the Astronomy and Astrophysics Decadal Survey
- 2008 – 2011 ALMA [international] Science Advisory Committee
- 2007 – 2008 Scientific organizing committee (co-chair)
 “Transformational Science with ALMA: The Birth and Feedback of Massive
 Stars, Within and Beyond the Galaxy”
- 2006 – 2009 IRAM Program Committee (i.e., time allocation committee; 6 proposal
 cycles; deputy chair, spring 2007; chair, fall 2007)
- 2006 – 2014 Committee on the Status of Minorities in Astronomy
 American Astronomical Society
- 2005 – 2006 Scientific organizing committee (chair)
 “From Z-Machines to ALMA: (Sub)millimeter Spectroscopy of Galaxies”
- 2005 – 2011 ALMA North American Science Advisory Committee (chair, 2007–2008)

Department and university[†] service (selected)

- 2022 – 2023 †Discovery Advantage initiative (Executive Steering Committee;
 Advising and Academic Support workstream)
- 2019 – 2022 †Aresty Research Center Advisory Council
- 2017 – 2019 †Rutgers Postdoctoral Advisory Council
- 2017 – 2020 †Rutgers Geology Museum Advisory Committee
- 2017 Peer Evaluation Committee, Faculty Compensation Program
- 2016 – 2020 Seminar In Graduate Mentoring for Astronomy and Physics (SIGMA-P)
- 2015 – 2018 †Honors Committee (School of Arts and Sciences)
- 2015 – 2022 †Honors College Faculty Board
- 2014 – †Mock interview panelist, Office of Distinguished Fellowships
- 2013 †“Envisioning Tomorrow’s University” strategic planning committee
- 2013 – Faculty liaison, Friends of Rutgers Astronomy
- 2013 – 2018 Director, NSF Physics and Astronomy REU site
- 2012 – 2014 †Physical & Mathematical Sciences & Engineering Area Committee (GSNB)
- 2012 – 2013 †Nominations and Elections Committee (School of Arts and Sciences)