Aki Roberge

NASA Goddard Space Flight Center
Exoplanets & Stellar Astrophysics Lab.
Code 667
Greenbelt, MD 20771
http://asd.gsfc.nasa.gov/Aki.Roberge/home.html

Phone: (301) 286-2967
Aki.Roberge@nasa.gov
Updated August 30, 2022

RESEARCH INTERESTS: Study of planet formation through multi-wavelength observations of young circumstellar disks. Development of future space telescope concepts.

EDUCATION

The Johns Hopkins University, Baltimore, MD
- Ph.D. in Astrophysics — 2003
- M.A. in Physics — 1999

Massachusetts Institute of Technology, Cambridge, MA
- B.S. in Physics w/ Planetary Science minor — 1996

PROFESSIONAL APPOINTMENTS

Associate Director for Technology & Strategy — 2022 – present
NASA Goddard Space Flight Center, Astrophysics Science Division

Research Astrophysicist — 2008 – present
NASA Goddard Space Flight Center, Exoplanets & Stellar Astrophysics Lab.
- Study Scientist, NASA LUVOIR Decadal Large Mission Study — 2016 – 2019
- Member, WFIRST Formulation Science Working Group — 2015 – 2020
- Member, NASA Exoplanet Probe Science and Technology Definition Team, External Occulter (Exo-S) Concept — 2013 – 2015

Acting Deputy Director — 2021
NASA Goddard Space Flight Center, Sciences and Exploration Directorate

Discipline Scientist — 2020 – 2021
NASA Headquarters, Astrophysics Division
- Deputy Program Scientist, Nancy Grace Roman Space Telescope

NASA Postdoctoral Program Research Associate — 2005 – 2008
NASA Goddard Space Flight Center, Exoplanets & Stellar Astrophysics Lab.

Carnegie Postdoctoral Research Fellow — 2002 – 2005
Carnegie Institution of Washington, Dept. of Terrestrial Magnetism

Graduate Research Assistant — 1997 – 2002
The Johns Hopkins University, Dept. of Physics & Astronomy

Selected Awards

NASA Honor Awards, Exceptional Achievement Medal	2020
Robert H. Goddard Award for Leadership	2019
GSFC Special Act Award, "Exceptional Outreach to Minority Serving Institutions"	2015
Robert H. Goddard Award for Science	2014

Selected Awarded Projects

NASA Nexus for Exoplanet System Science

- Co-I on "The Virtual Planetary Laboratory: Advancing the Search for Life Beyond the Solar System" — 2018 – 2023
- Co-I on "Rocky Planet Habitability: Insights from Solar System Climate Dynamics Through Time" — 2015 – 2019

NASA WFIRST Science Investigation Team — 2015 – 2020

- Deputy PI for Turnbull Coronagraph SIT Team

NASA Research Opportunities in Space and Earth Sciences (ROSES)

- Co-I on APRA project "Development and Flight-testing of Technology for Future NASA Astrophysics Missions" — 2015 – 2018
- PI on Origins of Solar Systems project "Finding the Needle in the Haystack: Realistic Simulations of ExoEarth Observations in the Presence of Exozodiacal Dust" — 2009 – 2012

NASA Astrobiology Institute

- Co-I on "Goddard Center for Astrobiology: Origin and Evolution of Organics in Planetary Systems" — 2008 – 2019

NASA Astrophysics Strategic Mission Concept Studies — 2008

- Co-I on *New Worlds Observer* telescope + free-flying occulter mission study
- Co-I on *Star Formation Observatory* optical/UV instrument study

NASA Origins Science Mission Concept Study — 2004

- Co-I on *HORUS* UV/optical telescope mission study

Selected Service Activities

NASA Science Mission Directorate Large Mission Study core team member	2019 – 2021
NASA Planetary Science Advisory Committee member	2018 – 2020
US Military Academy Collaborative Consultation Committee member	2018 – 2019
NASA GSFC / Howard University Interaction Days co-organizer	2014 – 2016

NASA Astrophysics Visionary Roadmap team member 2013

NASA Exoplanet Exploration Program Analysis Group (ExoPAG) Executive Committee member 2009 – 2013

Scientific Organizing Committees

- "NASA Sagan Exoplanet Summer Workshop", Pasadena CA July 2022
- "NExSS Habitable Worlds 2021 Workshop", virtual Feb. 2021
- "NASA Sagan Exoplanet Summer Workshop", Pasadena CA July 2019
- "The Space Astrophysics Landscape for the Next Decade: Major Missions for the 2020s and Beyond", Washington DC Mar. 2019
- "NExSS Habitable Worlds 2017: A System Science Workshop", Laramie WY Nov. 2017
- "Exoclipse Conference", Boise ID Aug. 2017
- "High-Contrast Imaging in Space Workshop", Baltimore MD Nov. 2016
- "Space Telescopes and Instrumentation: Optical, Infrared, and Millimeter Wave", SPIE Astronomical Telescopes + Instrumentation Conference, Edinburgh, Scotland June 2016
- AAS Division for Planetary Science Annual Meeting, Washington DC Nov. 2015
- "Exploring the Universe with JWST Conference", Noordwijk, Netherlands Oct. 2015
- "Physics of Planetary Atmospheres: From Earth to Exoplanets," AGU Chapman Conference, Annapolis MD June 2013
- "Enhancing the Legacy of HST Spectroscopy Workshop", Baltimore MD Nov. 2012
- "From Atoms to Pebbles: Herschel's View of Star and Planet Formation Symposium", Grenoble, France Mar. 2012
- "Far-IR Astronomy from Space: A Community Workshop about the Future", Pasadena CA May 2008

Peer-Review Panels: chair, member, or external reviewer

NASA ROSES (APRA, SAT, TDEM, Exoplanets, & Origins of Solar Systems), NASA *James Webb Space Telescope*, NASA Sagan Fellowship Program, NASA *Hubble Space Telescope*, W. M. Keck Observatory (NASA time), NSF Astronomy, ESA ALMA Observatory, European Research Council, French Agence Nationale de la Recherche, Canadian Space Agency, Netherlands Organization for Scientific Research

Selected Awarded Observing Proposals

NASA/ESA *James Webb Space Telescope*

- Co-I on Cycle 1 program "Search for NIR Gas in Debris Disks. Is There a Water Delivery Mechanism?" 2021

NASA/ESA *Hubble Space Telescope*

Co-I on Cycle 25 program "The Mega-MUSCLES Treasury Survey: Measurements of the UV Spectral Characteristics of Low-mass Exoplanetary Systems" 2017

PI on Cycle 23 program "Inventoring Gas in Debris Disks: UV Spectroscopy of η Tel" 2015

Co-I on Cycle 22 program "The MUSCLES Treasury Survey: Measurements of the UV Spectral Characteristics of Low-mass Exoplanetary Systems 2014

Atacama Large Millimeter Array

Co-I on Cycle 7 program "C I Survey" 2019

PI on Cycle 3 program "The Mysterious Gas in the 49 Ceti Debris Disk" 2015

Large Binocular Telescope Interferometer

Co-I on NASA Key Science Team program "Signal *and* Noise: Debris Disks and Exozodiacal Dust" 2012 – 2017

ESA *Herschel Space Observatory*

PI on Open Time 2 program "Ultra-Cold Material in Young Debris Disks" 2012

Co-I on Open Time Key Programmes "Gas in Protoplanetary Systems" (GASPS) & "Dust Around Nearby Stars" (DUNES) 2009 – 2013

NASA *Spitzer Space Telescope*

PI on Cycle 2 program "Determining the Disk Fraction Among Shell Stars: A Survey for CS Disks with Gas and Dust" 2005

NASA/CNES/CSA *Far Ultraviolet Spectroscopic Explorer*

PI on Cycle 4 program "Circumstellar Gas in Young Planetary Debris Disks" 2003

Teaching & Mentoring

Research mentor, NASA Postdoctoral Program 2013 – 2019

Allison Youngblood, Maxime Rizzo, Christopher Stark

Research advisor, Ph.D. students 2007 – 2016

Amy Steele, Ashlee Wilkins, Jessica Donaldson (University of Maryland, College Park), Erika Nesvold (University of Maryland, Baltimore County), Tala Monroe (Indiana University), Lynnae Quick (Catholic University)

Research advisor, undergraduate and pre-doctoral students 2014 – present

Junellie Gonzalez-Quiles (UMCP), Steve Anusie, Aara'L Yarber, Ameer Blake (Howard University), Tiffany Jansen (University of Washington), Andrew Lincowski (University of Arizona), Brittany Miles (UCLA)

Graduate teaching assistant, Johns Hopkins University 1996 – 1997

Undergraduate level *General Physics for Biological Science Majors* & general physics lab.

Invited Talks, Last 5 Years

NASA Sagan Exoplanet Summer Workshop, Pasadena CA	July 2022
"Multi-Faceted Views of Planet Formation" Meeting-in-a-Meeting, 240th Meeting of the AAS, Pasadena CA	June 2022
Enabling Future Comparative Exoplanetology Splinter Meeting, Exoplanets IV Conference, Las Vegas NV	May 2022
University of Washington Astrobiology Colloquium, Seattle WA	Apr. 2022
NASA GSFC Technical Managers Training, online	Mar. 2022
Robert H. Goddard Memorial Symposium, College Park MD	Mar. 2022
CHAMELEON Winterschool, Dutch Space Research Institute, online	Jan. 2022
Institut für Weltraumforschung Colloquium, Austrian Academy of Sciences, online	Jan. 2022
NASA Sagan Exoplanet Summer Workshop, online	July 2021
US Technology Leadership Council Speaker Series, online	May 2021
5th Network for Ultraviolet Astronomy Workshop, online	Oct. 2020
American Institute of Aeronautics and Astronautics Los Angeles-Las Vegas Section Meeting, online	July 2020
SPIE Optical Engineering + Applications Conference, San Diego CA	Aug. 2019
NASA Sagan Exoplanet Summer Workshop, Pasadena CA	July 2019
Science with HabEx Community Meeting, New York NY	Oct. 2018
International Astrobiology Summer School, Santander, Spain	June 2018
US Military Academy Evening Lecture, West Point NY	May 2018
Planetary Habitability and the Search for Life Workshop, Leiden, Netherlands	Apr. 2018
Robert H. Goddard Memorial Symposium, Greenbelt MD	Mar. 2018
AAAS Annual Meeting Science Session, Austin TX	Feb. 2018
Workshop on Gaseous Debris Disks, Wako, Japan	Oct. 2017
Ball Aerospace Science and Technology Colloquium, Boulder CO	Oct. 2017
US Naval Observatory Science Colloquium, Washington DC	July 2017
University of Colorado APS Colloquium, Boulder CO	Apr. 2017
Laboratoire d'Astrophysique de Marseille Science Colloquium, Marseille, France	Apr. 2017

Selected Outreach

"The Search for Life: Are We Alone?", NASA Curious Universe podcast	June 2022

Faces of NASA web feature	June 2022
World Above the Tetons Speaker Series, Wyoming Stargazing, remote	Apr. 2021
"Exoplanets Everywhere!" panel, AAAS News Briefing, Austin TX	Feb. 2018
"Towards Earth 2.0: Exoplanets and Future Missions", NASA GSFC presentation for US Congressman Babin and staff, Greenbelt MD	June 2017
"Finding Earth 2.0: Extraordinary Tools to Expand the Search Space", 86th Joseph Henry Lecture, Philosophical Society of Washington, Washington DC	May 2017
"The Search for Life", Maryland Space Business Roundtable Annual Reception, National Air and Space Museum, Washington DC	Sept. 2016
"Nearby Star's Icy Debris Suggests 'Shepherd' Planet" narrator, NASA Press Feature	Mar. 2014
"Exoplanets and Astrobiology" panel, Science Fiction & Fantasy Writers of America Nebula Awards Weekend	May 2012

PUBLICATIONS

Journal articles and book chapters: 91 (15 as first author), h-index: 40
Click to view full list of publications on the NASA Astrophysics Data System

Some Notable Publications

12. Youngblood, A., Roberge, A., MacGregor, M. A., et al. (2021). "A Radiatively Driven Wind from the η Tel Debris Disk." The Astronomical Journal, 162, 235
11. Stapelfeldt, K., Roberge, A., Mandell., A., & Rauer, H. (2021). "Space Missions for Exoplanets", In *ExoFrontiers: Big questions in exoplanetary science* (ed. N. Madhusudhan), Institute of Physics Publishing, ISBN 978-0-7503-1470-1, doi:10.1088/2514-3433/abfa8fch9
10. Quick, L. C., Roberge, A., Mlinar, A. B., & Hedman, M. M. (2020). "Forecasting Rates of Volcanic Activity on Terrestrial Exoplanets and Implications for Cryovolcanic Activity on Extrasolar Ocean Worlds." Publications of the Astronomical Society of the Pacific, 132, 084402
9. Roberge, A. & Moustakas, L. A. (2018). "The Large Ultraviolet/Optical/Infrared Surveyor." Nature Astronomy, 2, 605
8. Roberge, A. & Seager, S. (2018). "The 'Spectral Zoo' of Exoplanet Atmospheres." In *Handbook of Exoplanets* (eds. H. J. Deeg & J. A. Belamonte), Springer International Publishing, ISBN 978-3-319-30648-3, doi:10.1007/978-3-319-30648-3_98-1
7. Roberge, A., Rizzo, M. J., Lincowski, A. P., et al. (2017). "Finding the Needles in the Haystacks: High-Fidelity Models of the Modern and Archean Solar System for Simulating Exoplanet Observations." Publications of the Astronomical Society of the Pacific, 129, 124401

6. Stark, C. C., Roberge, A., Mandell, A., et al. (2015). "Lower Limits on Aperture Size for an ExoEarth Detecting Coronagraphic Mission." The Astrophysical Journal, 808, 149
5. Roberge, A. (2014). "Hurling Comets Around a Planetary Nursery." Nature, 514, 440
4. Dent, W. R. F., Wyatt, M. C., Roberge, A., et al. (2014). "Molecular Gas Clumps from the Destruction of Icy Bodies in the β Pictoris Debris Disk." Science, 343, 1490
3. Roberge, A., Chen, C. H., Millan-Gabet, R., et al. (2012). "The Exozodiacal Dust Problem for Direct Observations of ExoEarths." Publications of the Astronomical Society of the Pacific, 124, 799
2. Roberge, A. & Kamp, I. (2011). "Protoplanetary & Debris Disks." In *Exoplanets* (ed. S. Seager), Univ. of Arizona Press, Tucson AZ, ISBN 978-0-8165-2945-2, p. 269-295
1. Roberge, A., Feldman, P. D., Weinberger, A. J., et al. (2006). "Stabilization of the β Pictoris disk by extremely carbon-rich gas." Nature, 441, 724