

Dr. Brian J. Williams

Curriculum Vitae

Contact Information

Work Address: NASA Goddard Space Flight Center
Code 662
Greenbelt, MD 20771

Telephone: (0) 301-614-5085

Email: brian.j.williams@nasa.gov

Website: <https://asd.gsfc.nasa.gov/Brian.Williams/>

Education

August 2004- May 2010 **Ph.D., Physics**
North Carolina State University, Raleigh, NC
Minor: Interdisciplinary - Astronomy, Mathematics, Nuclear Physics
Dissertation: Supernova Remnants as a Probe of Dust Grains in the
ISM
Ph.D. Advisors: Dr. Stephen Reynolds and Dr. Kazimierz Borkowski

August 2000 - May 2004 **B.S., Physics**
Florida State University, Tallahassee, FL
Minor: Mathematics

Positions Held

May 2018 – present **Research Astrophysicist, NASA Goddard Space Flight Center**

6/2019 – present NASA Project Scientist, X-ray Imaging and Spectroscopy Mission (XRISM)

5/2018 – 6/2019 NASA Deputy Project Scientist, XRISM

4/2022 – present Associate PI, Advanced X-ray Imaging Satellite (AXIS) Probe study

9/2020 – 6/2022 Chief Scientist, NASA Physics of the Cosmos (PhysCOS) Program Office

Feb 2017 – May 2018 **Support Scientist**, Space Telescope Science Institute, Baltimore, MD.

April 2015 – Feb 2017 **Research Scientist**, X-ray Astrophysics Laboratory, NASA Goddard Space Flight Center / Universities Space Research Association,

Greenbelt, MD.

<i>April 2012 – April 2015</i>	<u>NASA Postdoctoral Program Fellow</u> , NASA Goddard Space Flight Center, Greenbelt, MD. Advisor: Robert Petre
<i>Fall 2010 – March 2012</i>	<u>Postdoctoral Research Associate</u> , N.C. State University, Raleigh, N.C.
<i>Summer 2010, 2011</i>	<u>Physics Instructor</u> , N.C. State University, Raleigh, N.C.
<i>Fall 2010</i>	<u>Adjunct Professor</u> , Meredith College, Raleigh, N.C.
<i>Jan. 2005 – May 2010</i>	<u>Graduate Research Assistant</u> , N.C. State University, Raleigh, N.C.
<i>Aug. 2004 – May 2005</i>	<u>Graduate Teaching Assistant</u> , N.C. State University, Raleigh, N.C.

Publications

All publications may all be viewed in my personal library on ADS, here:

<https://ui.adsabs.harvard.edu/public-libraries/vVrAYKDjS62REABr-rZ7vA>

Total refereed papers, as of April 2023: ~75

h-index, as of April 2023: ~30

First Author Refereed Journal Articles

- (15) **B.J. Williams**, Ghavamian, P., Seitzzahl, I.R., Reynolds, S.P., Borkowski, K.J., Petre, R. *Evidence for a Dense, Inhomogeneous Circumstellar Medium in the Type Ia SNR 0519-69.0*, 2022.
- (14) **B.J. Williams**, Katsuda, S., Cumbee, R., Petre, R., Raymond, J.C., Uchida, H. *RGS Observations of Ejecta Knots in Tycho's Supernova Remnant*, 2020, ApJ, 898, 51
- (13) **B.J. Williams**, W.P. Blair, K.J. Borkowski, P. Ghavamian, S.P. Hendrick, K.S. Long, R. Petre, J.C. Raymond, A. Rest, S.P. Reynolds, R. Sankrit, I.R. Seitzzahl, P.F. Winkler. *The Expansion of the Young Supernova Remnant 0509-68.7 (N103B)*, 2018, ApJ, 865, 13
- (12) **B.J. Williams**, J.W. Hewitt, R. Petre, T. Temim. *A Deep X-ray View of the Synchrotron-Dominated Supernova Remnant G330.2+1.0*, 2018, ApJ, 855, 118
- (11) **B.J. Williams**, N.M. Coyle, H. Yamaguchi, J. Depasquale, I.R. Seitzzahl, J.W. Hewitt, J.M. Blondin, K.J. Borkowski, P. Ghavamian, R. Petre, S.P. Reynolds. *The Three-dimensional Expansion of the Ejecta from Tycho's Supernova Remnant*, 2017, ApJ, 842, 28
- (10) **B.J. Williams**, L. Chomiuk, J.W. Hewitt, J.M. Blondin, K.J. Borkowski, P. Ghavamian, R. Petre, S.P. Reynolds. *An X-ray and Radio Study of the Varying Expansion Velocities in Tycho's Supernova Remnant*, 2016, ApJ, 823, 32

- (9) **B.J. Williams** & O.D. Fox. *SOFIA Observations of SN 2010jl: Another Non-Detection of the 9.7-micron Silicate Dust Feature*, 2015, ApJL, 808, 22
- (8) **B.J. Williams**, B. Rangelov, O. Kargaltsev, G.G. Pavlov. *Magnesium-rich Ejecta in the SNR G284.3-1.8 Around the High-Mass Gamma-Ray Binary 1FGL J1018.6-5856*, 2015, ApJL, 808, 19
- (7) **B.J. Williams**, K.J. Borkowski, S.P. Reynolds, P. Ghavamian, J.C. Raymond, K.S. Long, W.P. Blair, R. Sankrit, P.F. Winkler, S.P. Hendrick. *Spitzer Observations of the Type Ia Supernova Remnant N103B: Kepler's Older Cousin?* 2014, ApJ, 790, 139
- (6) **B.J. Williams**, K.J. Borkowski, P. Ghavamian, J.W. Hewitt, S.A. Mao, R. Petre, S.P. Reynolds, & J.M. Blondin. *Azimuthal Density Variations Around the Rim of Tycho's Supernova Remnant*, 2013, ApJ, 770, 129
- (5) **B.J. Williams**, K.J. Borkowski, S.P. Reynolds, P. Ghavamian, W.P. Blair, K.S. Long, & R. Sankrit. *Dust in a Type Ia Supernova Progenitor: Spitzer Spectroscopy of Kepler's Supernova Remnant*, 2012, ApJ, 755, 3.
- (4) **B.J. Williams**, W.P. Blair, J.M. Blondin, K.J. Borkowski, P. Ghavamian, K.S. Long, J.C. Raymond, S.P. Reynolds, J. Rho, & P.F. Winkler. *RCW 86: A Type Ia Supernova in a Wind-blown Bubble*, 2011, ApJ, 741, 96.
- (3) **B.J. Williams**, K.J. Borkowski, S.P. Reynolds, P. Ghavamian, J.C. Raymond, K.S. Long, W.P. Blair, R. Sankrit, R.C. Smith, S. Points, P.F. Winkler. *Dusty Blastwaves of Two Young LMC Supernova Remnants: Constraints on Postshock Compression*, 2011, ApJ, 729, 65.
- (2) **B.J. Williams**, K.J. Borkowski, S.P. Reynolds, J.C. Raymond, K.S. Long, J.A. Morse, W.P. Blair, P. Ghavamian, R. Sankrit, S.P. Hendrick, R.C. Smith, S. Points, P.F. Winkler. *Ejecta, Dust, and Synchrotron Radiation in B0540-69.3: A More Crab-Like Remnant than the Crab*, 2008, ApJ, 687, 1054
- (1) **B.J. Williams**, K.J. Borkowski, S.P. Reynolds, W.P. Blair, P. Ghavamian, S.P. Hendrick, K.S. Long, J.C. Raymond, R. Sankrit, R.C. Smith, S. Points, P.F. Winkler. *Dust Destruction in Fast Shocks of Core-Collapse Supernova Remnants in the Large Magellanic Clouds*, 2006, ApJL, 652, 33.

Other Publications

- A. Bamba, **B.J. Williams**. *Supernova Remnants: Types and Evolution*, 2022, Springer Handbook of X-ray and Gamma-ray Astrophysics. Review article.
- T. Temim, **B.J. Williams**, L. Lopez. *The Many Faces of Supernova Remnants*, 2015, Chandra News, Issue 22, Published by the Chandra X-ray Center
- **B.J. Williams**, T. Temim. *Infrared Emission from Supernova Remnants: Formation and Destruction of Dust*, 2016, Springer Handbook of Supernovae. Review article.

Mentoring

Dr. Adrien Picquenot, Postdoc, 2021 - present

Dr. Ben Guest, Postdoc, 2020 - present

Sadie Coffin, Post-Baccalaureate researcher, NASA GSFC, 2020-2021

Dr. Toshiki Sato, RIKEN Special Postdoctoral Fellow, NASA GSFC, 2018-2020.

Nina Coyle, University of Chicago. NASA summer internship program, 2014.

Aaron Tran, University of California-Berkeley. NASA summer internship program, 2014.

Total Science PI Funding

\$154,000	Chandra Guest Observer Program, 2020
\$70,210	Chandra Guest Observer Program, 2020
\$54,413	Hubble Guest Observer Program, 2019
\$184,260	Chandra Guest Observer Program, 2019
\$40,539	Hubble Guest Observer Program, 2017
\$64,272	XMM-Newton Guest Observer Program, 2017
\$50,752	XMM-Newton Guest Observer Program, 2016
\$46,620	Hubble Guest Observer Program, 2015
\$148,500	Chandra Guest Observer Program, 2015
\$42,107	NASA Astrophysics Data Analysis Program, 2014
\$52,225	XMM-Newton Guest Observer Program, 2014
\$8,000	SOFIA Guest Observer Program, 2014
\$64,091	Chandra Guest Observer Program, 2013
\$32,225	Herschel Guest Observer Program, 2012
\$61,879	NASA Astrophysics Data Analysis Program, 2012
\$200,751	NASA Astrophysics Data Analysis Program, 2010
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\$1,274,844	TOTAL

Professional Activity and Service

Member, Chandra Users' Committee, Spring 2021 – Fall 2023

Member, American Astronomical Society (AAS)

Member, American Physical Society (APS)

Member, High Energy Astrophysics Division of the AAS

Referee, *The Astrophysical Journal*

Referee, *Astronomy & Astrophysics*

Referee, *Monthly Notices of the Royal Astronomical Society*

Referee, *Publications of the Astronomical Society of Japan*

Colloquia/Seminars

April 2023

Colloquium, University of Utah

<i>March 2022</i>	Colloquium, Pittsburgh/Carnegie Mellon
<i>March 2022</i>	Seminar, Harvard-Smithsonian Center for Astrophysics
<i>February 2022</i>	Colloquium, University of California, Irvine
<i>September 2021</i>	Colloquium, George Washington University
<i>September 2020</i>	Colloquium, University of Arizona/Steward Observatory
<i>November 2017</i>	Seminar, Johns Hopkins University Dept. of Physics and Astronomy
<i>October 2015</i>	Seminar, Rutgers University Physics Dept.
<i>March 2014</i>	Seminar, University of Delaware Dept. Of Physics and Astronomy
<i>August 2013</i>	Colloquium, Astrophysics Science Division, NASA GSFC
<i>February 2013</i>	Colloquium, Towson University, Dept. Of Physics, Chemistry, and Geoscience
<i>October 2012</i>	Colloquium, SOFIA Science Center, NASA Ames, Mountain View, CA
<i>September 2012</i>	Seminar, Yale Center for Astronomy and Astrophysics
<i>November 2011</i>	Colloquium, N.C. State University Physics Department
<i>March 2011</i>	Seminar, Space Telescope Science Institute, Baltimore, MD
<i>March 2011</i>	Seminar, NASA GSFC
<i>July 2010</i>	Seminar, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA

Conference Talks

<i>March 2023</i>	High-Energy Astrophysics Division Meeting
<i>January 2023</i>	AAS Winter Meeting, Seattle, WA
<i>August 2022</i>	Supernova Remnants and Their Progenitors, Cambridge, MA
<i>June 2022</i>	European Astronomical Society meeting (withdrawn)
<i>June 2022</i>	Ten Years of High-Energy Universe in Focus: NuSTAR 2022, virtual
<i>March 2022</i>	High-Energy Astrophysics Division Meeting, Pittsburgh, PA
<i>January 2021</i>	AAS Winter Meeting, Virtual world
<i>April 2020</i>	APS April Meeting, Virtual world
<i>January 2020</i>	AAS Winter Meeting, Honolulu, HI
<i>December 2019</i>	20 Years of Chandra Science Symposium, Boston, MA
<i>October 2019</i>	XMM-Newton 20 th Anniversary Goddard Symposium, GSFC
<i>July 2019</i>	XCalibur: Next Generation X-ray Spectroscopy, Winchester, UK
<i>June 2019</i>	An Odyssey in Space After Stellar Death, Crete, Greece
<i>April 2019</i>	The Deaths and Afterlives of Stars, Baltimore, MD
<i>April 2019</i>	The Space Astrophysics Landscape for the 2020s and Beyond
<i>March 2019</i>	High-Energy Astrophysics Division Meeting, Monterey, CA
<i>January 2019</i>	AAS Winter Meeting (canceled due to US government shutdown), Seattle, WA
<i>September 2018</i>	International Workshop on Astronomy and Relativistic Astrophysics, Peru
<i>March 2018</i>	Science with Precision Astrometry, Baltimore, MD
<i>February 2018</i>	Observational Signatures of Type Ia SNe III, Leiden, Netherlands
<i>December 2017</i>	Deciphering the Violent Universe, Playa del Carmen, Mexico
<i>August 2017</i>	High-Energy Astrophysics Division Meeting, Sun Valley, ID
<i>January 2017</i>	AAS Winter Meeting, Grapevine, TX
<i>August 2016</i>	COSPAR General Assembly (canceled), Istanbul, Turkey
<i>June 2016</i>	An Odyssey in Space After Stellar Death, Crete, Greece
<i>January 2016</i>	AAS Winter Meeting, Kissimmee, FL
<i>July 2015</i>	IAU General Assembly, Honolulu, HI
<i>May 2015</i>	Fifty-One Ergs, Raleigh, NC
<i>November 2014</i>	15 Years of Science with Chandra, Boston, MA

<i>August 2014</i>	Supernovae in the Local Universe, Australia
<i>June 2014</i>	The X-ray Universe, Dublin, Ireland
<i>June 2014</i>	AAS Summer Meeting, Boston, MA
<i>September 2013</i>	Observational Signatures of Type Ia SNe, Leiden, Netherlands
<i>May 2013</i>	Fifty-One Ergs, Raleigh, NC
<i>May 2013</i>	The Fast and the Furious, Madrid, Spain
<i>November 2012</i>	Dust in Core-Collapse SNe, Ascona, Switzerland
<i>October 2012</i>	Nature's Particle Accelerators, Annapolis, MD
<i>August 2012</i>	Cosmic Kaleidoscope, Kruger, South Africa
<i>March 2012</i>	Mass Loss Return from Massive Stars, Baltimore, MD
<i>January 2010</i>	AAS Winter Meeting, Washington, D.C.

Successful PI Proposals

Deep Observations of the LMC SNR 0519-69.0, Chandra X-ray Observatory, 2020, Budget amount **\$154K**

Tycho's SNR: A New Era, Chandra X-ray Observatory, 2020, Budget amount **\$70K**

A Tale of Two Remnants: A Comparative Study of the Young Ia SNRs 0509-67.5 and 0519-69.0, 2019, Chandra X-ray Observatory / Hubble Space Telescope, **Budget \$184K (Chandra), \$54K (Hubble)**

Measuring the Deceleration of a Supernova Remnant Shock Wave Using High-Precision Astrometry, 2017, Hubble Space Telescope, Budget **\$41K**

RGS Observations of Peculiar Knots in Tycho's SNR, XMM-Newton Observatory, 2016, ESA, Budget amount **\$64K**

Observations of PKS 1209-51/52: A Cygnus Loop Sibling?, XMM-Newton Observatory, 2016, ESA, Budget amount **\$51K**

N103B: A Type Ia Remnant with Circumstellar Interaction... Kepler's Older Cousin?, Chandra X-ray Observatory / Hubble Space Telescope, 2015, NASA, Budget amount **\$149K (Chandra), \$46K (Hubble)**.

Suzaku Observations of G189.6+3.3: An SNR Companion to IC 443?, 2014, NASA Astrophysics Data Analysis Program, **Science PI – B.J. Williams**, Budget PI – R. Petre, **\$42K**

Observations of G189.6+3.3: An SNR Companion to IC 443?, Suzaku, 2014, JAXA, PI – **B.J. Williams**

Gas-Phase Abundance Variations from Dust Grain Sputtering in an SNR Shock, XMM-Newton Observatory, 2013, ESA, **Science PI – B.J. Williams**, Budget PI – R. Petre, **\$52K**

XMM-Newton Observations of G330.2+1.0, XMM-Newton Observatory, 2013, ESA, no funding.

Dynamics of a Type Ia SNR: Proper Motions in Tycho, Chandra X-ray Observatory, 2013, NASA, Science PI – **B.J. Williams**, Budget PI – R. Petre, **\$64K**

The Composition of Dust in a Type II_n Supernova, SOFIA, 2013, NASA, **Science PI – B.J. Williams**,

Budget PI – R. Petre, **\$8K**

A Multiwavelength Study of Tycho's Supernova Remnant, 2012, NASA Astrophysics Data Analysis Program, **Science PI – B.J. Williams**, Budget PI – R. Petre, **\$62K**

Herschel imaging of SNR G292.0+1.8: Cas A's older cousin?, Herschel Space Observatory, 2011, ESA, **Science PI – B.J. Williams**, Budget PI – P. Ghavamian, **\$32K**

Galactic Supernova Remnants in the Infrared: An Archival Survey with Spitzer's MIPS and IRS, 2009, NASA Astrophysics Data Analysis Program, **Science PI – B.J. Williams**, PI – K.J. Borkowski, **\$201K**

Press Coverage

RCW 86: “*NASA Telescopes Help Solve Ancient Supernova Mystery*,”
http://www.nasa.gov/mission_pages/spitzer/news/spitzer20111024.html

SN 1006: “*X-Ray View of a Thousand-Year-Old Cosmic Tapestry*,”
<http://chandra.harvard.edu/photo/2013/sn1006/>

N103B: “*New Suspect Identified in Supernova Explosion*,”
<http://www.nasa.gov/jpl/spitzer/supernova-20140604/>

3C 397: “*Suzaku Studies Supernova 'Crime Scene,' Shows a Single White Dwarf to Blame*,”
<http://www.nasa.gov/content/goddard/suzaku-studies-supernova-crime-scene-shows-a-single-white-dwarf-to-blame>

Tycho's Supernova Remnant: “*Chandra Movie Captures Expanding Debris From a Stellar Explosion*,”
<http://chandra.si.edu/photo/2016/tycho/>

Perseus Cluster: “*Hitomi Mission Charts Hot Winds of a Galaxy Cluster for the First Time*”
<http://www.nasa.gov/feature/goddard/2016/hitomi-mission-charts-hot-winds-of-a-galaxy-cluster-for-the-first-time>

Tycho's Supernova Remnant: “*A 3D View of a Supernova Remnant*,” AAS Nova
<http://aasnova.org/2017/06/14/a-3d-view-of-a-supernova-remnant/>

SNR 0519-69.0: *Setting the Clock on a Stellar Explosion*
<https://chandra.harvard.edu/photo/2022/snr0519/>

Teaching Experience

Summer 2011, 2010

PY 299 - Introductory Quantum Mechanics.
NCSU, Raleigh, NC.

for

Developer and instructor for introductory course in quantum physics junior/senior-level undergraduate physics majors.

- Fall 2010* **PHY 211 - General Physics I.**
Meredith College, Raleigh, NC
 Adjunct faculty and instructor for two sections of introductory classical mechanics.
- Fall 2010* **PHY 241 – General Physics I Laboratory.**
Meredith College, Raleigh, NC
 Adjunct faculty and instructor for two sections of classical mechanics lab.
- Fall 2009 – Spring 2010* **PY 411/412 – Classical Mechanics I-II.**
NCSU, Raleigh, NC
 Supplementary Instructor, as part of PY 885, Doctoral Supervised Teaching, under the guidance of Dr. Stephen Reynolds. Prepared and gave approximately 12 lectures during the year.
- Fall 2004 - Spring 2005* **PY 205 - Physics for Engineers and Scientists.**
NCSU, Raleigh, NC
 Graduate Teaching Assistant for laboratory sections of PY 205.

Outreach Activities

Guest Blogger, *Blueshift*, NASA's Astrophysics blog

American Astronomical Society Liaison, Congressional Visits Day, 2013

Panelist, “Ask an Astrophysicist” website, 2012 – 2017

State Event Leader, North Carolina Science Olympiad, 2009 – 2011

Public Outreach Liaison, NCSU Astrophysics, 2006 – 2012

Coordinator, NCSU Astronomy Open House, 2006 – 2012

Honors, Awards, and Achievements

- October 2020* NASA Early Career Achievement Medal
- October 2011* NASA Postdoctoral Program Fellowship
- July 2011* “Early Career” Travel Grant, High Energy Astrophysics Division of the American Astronomical Society
- March 2009* First Place, NCSU Graduate Research Symposium, Physical and Mathematical Sciences Division. Presentation entitled, “*Supernova Remnants as a Probe of Dust Grains in the Interstellar Medium*”
- May 2004* Perfect scores on GRE Math (800) and Writing (6.0).
- April 2004* High Scholarship in Physics, Florida State University
- April 2004* Elected as a member of Sigma Pi Sigma, the National Physics Honor Society

August 2000-May 2004

Florida Academic Scholars Bright Futures Scholarship- Full
academic scholarship for undergraduate education at FSU

August 2000-May 2004

Florida State University Honors Program Scholarship

October 1999

Perfect score on SAT Math (800)