
Curriculum Vitae
Stephan Robert McCandliss
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Familial History

1955/09/07	Born	Salinas California
1989/01/01	Married	Ann Marie McCandliss (nee Selander)
1989/11/10	Daughter	Rachel Pearl McCandliss
1992/05/26	Son	Ian Frederick McCandliss

Education

1988	Ph.D. Astrophysics	University of Colorado, Boulder
1980	B.S. Physics	University of Washington, Seattle
1980	B.S. Astronomy	University of Washington, Seattle

Work History

2010 – present	Research Professor	Johns Hopkins University
2002 – 2010	Principal Research Scientist	Johns Hopkins University
1994 – 2002	Research Scientist	Johns Hopkins University
1988 – 1994	Associate Research Scientist	Johns Hopkins University
1980 – 1988	Ph.D. Candidate	University of Colorado, Boulder
1977 – 1980	Reader and Lab Assistant	University of Washington, Seattle

Primary Research Interests

The ionization history of the universe.
Spectral signatures of dust, molecules and atoms in astrophysical environments.
Rapid-response space science missions and enabling low-cost access to space.

Service

2011	NASA APRA/SAT UV/Vis Panel Chair
2011	NSF Astronomy Advanced Technology and Instrumentation Opt/IR Panel
2008 – present	Astrophysics Sounding Rocket Assessment Team
2008, 2009	NASA APRA UV/Vis Panels
2008, 2010	HST Cycle 17, 18 Proposal Reviews
2008	Spitzer Cycle 5 Proposal Review
1999 – 2003	Sounding Rocket Working Group

Memberships

1986 – present	American Astronomical Society
1994 – 2003	Optical Society of America

Awards

1998	Comet Hale-Bopp Sounding Rocket Campaign
1996	1995 Woomera Sounding Rocket Campaign

Professional Overview

I am an astrophysicist with thirty-one years of experience in ground- and space-based research, with primary interests in the ionization history of the universe, nebular spectroscopy of dust, molecules and atoms, high efficiency spectroscopic design, and low cost access to space.

My post-graduate career began in 1988 upon accepting the position of project scientist with the Johns Hopkins University (JHU) sounding rocket group. Under the tutelage of Paul D. Feldman, William G. Fastie, Arthur F. Davidsen and H. Warren Moos, I developed novel far-uv space spectroscopic instrumentation to study the faint gaseous and dusty nebular environments surrounding comets, planets, and stars. Data derived from these missions have provided the observational basis for seven Ph.D. theses and concomitant investigations utilizing space- and ground-based facilities.

In the simulating environment offered by JHU, and nurtured by its strong legacy in spectroscopy, I have found a means to double the efficiency of far-uv spectrographs through the use of a novel dual-order design. I have further incorporated the dual-order feature into a “two-bounce” multi-object spectro-telescope, which again triples the efficiency, and provides for the acquisition of hundreds of individual spectra from regions automatically identified within a co-acquired image. My intent is to use these advances as the technical base for a space based mission to directly detect the leakage of ionizing radiation from galaxies and answer the question, “how did the universe come to be ionized?”

In 2004 I became the principal investigator for the NASA sounding rocket grant to JHU entitled, “Rocket and Laboratory Experiments in Astronomy – FORTIS: Pathfinder to the Lyman Continuum.” This program has been awarded a continuation through April 2015. I have also worked closely with Dr. Mary Elizabeth Kaiser to define a sounding rocket proposal with relevance to dark energy studies entitled, “Rocket and Laboratory Experiments in Astrophysics – ACCESS: Absolute Color Calibration for Standard Stars.” In 2008 she received a five-year award to advance this effort, which I continue to support. Most recently I have begun to collaborate with Professor C-L Chien, investigating the far-uv optical properties of aluminum alloy mirrors with the aim to achieve improved reflectance in this photon starved bandpass.

These programs further the JHU tradition of creating new science with innovative instruments, while providing unique opportunities for hands-on training of students in all phases of a space astronomy mission. The leadership and respect JHU enjoys among space-faring universities has roots in the vitality of our sounding rocket program and our success in mentoring instrumentally and scientifically proficient space scientists. My long-term goal is to further this leadership by pursuing new initiatives in space studies utilizing recent developments in rapid-response low-cost delivery systems.

Responsibilities

- Develop science directions and goals, instrumentation innovations, data analysis techniques and work schedules for the sounding rocket group.
 - Oversee the work of students, administrative assistants, technicians, engineers, and scientists working in small-team laboratory and field environments.
 - Conduct reviews with experiment, launch and service providers, to ensure compliance with mission success criteria.
 - Oversee calibration, integration, testing, performance verification and launch preparations.
 - Make launch go/nogo decision.
 - Develop follow-up observing projects to expand upon previous results.
 - Author scientific papers, proposals, budgets, statements of work, and grant reports.
 - Serve as a panelist on NASA science peer review and planning committees.
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Supervised Ph. D. Candidates and Graduates

2007 – present	Mr. Brian Fleming	Dissertation TBD
2003 – 2009	Dr. Roxana Lupu (BLAST/UPenn, SETI)	Molecular and Dust Scattering Processes in Astrophysical Environments
1999 – 2005	Dr. Kevin France (COS/CU)	Far-Ultraviolet Molecular Hydrogen Fluorescence in Photodissociation Regions
1996 – 2001	Dr. Eric Burgh (SALT/SAL, COS/CU)	Far-Ultraviolet Studies of Dust Extinction and Scattering
1991 – 1998	Dr. Jason McPhate (SSL, Berkeley)	Carbon Monoxide in Comets
1990 – 1997	Dr. Patrick Morrissey (GSFC, GALEX/Cal Tech)	Space Ultraviolet Spectroscopy and Imaging of Jupiter
1988 – 1995	Dr. Melaquias Martinez (FUSE/JHU, private sector)	Lyα and Lyβ in the Night Airglow Using the Faint-Object Telescope and the Hopkins Ultraviolet Telescope
1988 – 1992	Dr. David Sahnou (FUSE/JHU, COS/STScI)	Ultraviolet Spectroscopy of Comet Austin (1989c₁) Using a Two-Dimensional Diode Array Detector

Sounding Rocket Missions

2012	36.268UG	Target TBD
2008	36.223UG	Great Nebula in Orion (M42)
2007	36.220UG	Trifid Nebula (M20)
2003	36.208UG	γ Cas, IC 59 and IC 63
2001	36.198UG	Reflection Nebula IC 405
2000	36.186UG	Reflection Nebula NGC 2023
1999	36.136UG	Planetary Nebula NGC 6853 (M27, the Dumbbell)
1997	36.156UG	Comet Hale-Bopp
1996	36.115UG	Jovian aurorae
1995	36.132UG	30 Dor (from Woomera Australia)
1994	36.109UG	G191-B2B (reflight)
1992	36.085UG	G191-B2B Far-UV Calibration
1990	36.057UG	Io Torus (reflight)
1989	36.073UG	Comet Austin 1989c ₁
1988	36.045UG	Io Torus around Jupiter

Ground-based Observing Programs

2008 – present	APO DIS	Project Balmer
2007	Arecibo	HI Mapping of the PN M27
2006	APO DIS and NIC-FPS	Optical and IR Mapping of M27
1999, 2001, 2009	APO Echelle	M Giants and Symbiotics
1987	KPNO Fiber Optic Echelle	Wolf-Rayet and O-stars
1987	Sommers-Bausch B&L	Wolf-Rayet and O-stars

JHU/GSFC Grant History – Total awards \$15.4M since 1994**Space Instrumentation Grants**

2011 – 2015	NASA/ APRA	\$3.21M	PI	Rocket and Laboratory Studies in Astronomy with FORTIS
2008 – 2011	NASA/ APRA	\$1.62M	PI	Rocket and Laboratory Experiments in Astronomy – Quantifying the Gas-to Dust Ratio and Lyα Escape Fraction with FORTIS
2004 – 2008	NASA/ APRA	\$1.83M	PI	Rocket and Laboratory Experiments in Astronomy – FORTIS: Pathfinder to the Lyman Continuum
1996 – 2005	NASA	\$468K	PI	FUV Windowless Lamps
2008 – 2013	NASA/ APRA	\$3.36M	Co-I	Rocket and Laboratory Experiments in Astrophysics – ACCESS: Absolute Color Calibration for Standard Stars
2007 – 2008	DOE	\$199K	Co-I	Calibration Monitor for Dark Energy Experiments
2000 – 2004	NASA/ SARA	\$1.73M	Co-I	Rocket and Laboratory Experiments in Astronomy – LIDOS
2000 – 2001	NASA/ NGST	\$170K	Co-I	Comparative NIR Detector Characterization for NGST
1997 – 2000	NASA	\$1.66M	Co-I	Rocket and Laboratory Experiments in Astronomy
1994 – 1996	NASA/ JPL	\$63.5K	Co-I	UV/Visible CCD Development
2011-- 2014	NASA/ APRA	\$503K	Collab GSFC	Next Generation Microshutter Arrays

Space Observation Grants

2012 – 2013	HST	\$53K	PI	COS G140L CENWAV =800, a gapless low astigmatism mode for observations to the Lyman Limit
2008 – 2009	HST	\$90K	PI	Searching for Lyα Emission from FUSE Lyman Continuum Candidates
2006 – 2008	Spitzer	\$66K	PI	A Comparison of the Infrared and Ultraviolet Properties of Photodissociation Regions
2006 – 2008	FUSE	\$31K	PI	Search for Continuum Emission from Bright Non-Zero Redshift Objects in the Sloan/GALEX Merged Catalog
2005 – 2008	Spitzer	\$23K	PI	A Mid and Far-Infrared Study of IC 405: PAH and Dust Emission
2004 – 2005	FUSE	\$36K	PI	Far-UV H$_2$ Emission in Planetary Nebulae

December 2011

2003 – 2004	FUSE	\$39K	PI	Searching for Far Ultraviolet Fluorescence of Molecular Hydrogen in NGC 2023
2003– 2005	FUSE	\$30K	PI	Fluorescent Molecular Hydrogen in IC 405 and NGC 7023 – The Role of Environment
2009 – 2011	HST	\$18K	Co-I (adm-PI)	EG And: Providing the Missing Link Required for Modelling Red Giant Mass-loss
2007 – 2009	FUSE	\$9K	Co-I (adm-PI)	Understanding Mass-loss in Cool Giants: The Wind of SY MUS
2005 – 2007	FUSE	\$18K	Co-I (adm-PI)	A FUV Survey of Extragalactic Symbiotic Binary Stars
2005 – 2006	FUSE	\$12K	Co-I (adm-PI)	Symbiotic Binary Stars: Probing the Winds of Cool Giants
2005 – 2006	FUSE	\$22K	Co-I (adm-PI)	Astro-Tomography of Symbiotic Binaries
2002 – 2004	HST	\$40K	Co-I (adm-PI)	UV Sounding of the M-Giant Atmosphere in the Symbiotic Binary EG-AND
2001 – 2002	FUSE	\$53K	Co-I (adm-PI)	Symbiotic Binaries for Wind Studies
2000 – 2001	FUSE	\$41K	Co-I (adm-PI)	Emission and Absorption Line Studies of Symbiotic Binaries: Mass Loss and Shock Diagnostics

Contacts

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Publications

In Preparation

McCandliss, S. R., R. E. Lupu, B. Fleming, N. Bergvall, J-M. Deharveng, J. Kruk, P. Friedman, K. France, E. Leitet, T. M. Heckman, P. D. Feldman, G. R. Meurer, BG Andersson, and M. E. Kaiser **2012**, Escape of Lyman alpha from candidate Lyman continuum leak galaxies I. -- preliminary results, (to be submitted to ApJ)

Refereed Journals

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ApJ 647, L61-L64

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France, K., B.-G. Andersson, **S. R. McCandliss**, and P. D. Feldman **2005**, Fluorescent Molecular Hydrogen Emission in IC 63: FUSE, Hopkins Ultraviolet Telescope, and Rocket Observations, ApJ 628, 750-757

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France, K., **S. R. McCandliss**, E. B. Burgh, and P. D. Feldman **2004**, Rocket and Far Ultraviolet Spectroscopic Explorer Observations of IC 405: Differential Extinction and Fluorescent Molecular Hydrogen, ApJ 616, 257-265

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Massa, D., A. W. Fullerton, J. S. Nichols, S. P. Owocki, R. K. Prinja, N. St-Louis, A. J. Willis, B. Altner, C. T. Bolton, J. P. Cassinelli, D. Cohen, R. G. Cooper, A. Feldmeier, K. G. Gayley, T. Harries, S. R. Heap, R. N. Henriksen, I. D. Howarth, I. Hubeny, E. Kambe, L. Kaper, G. Koenigsberger, S. Marchenko, **S. R. McCandliss**, A. F. J. Moffat, T. Nugis, J. Puls, C. Robert, R. E. Schulte-Ladbeck, L. J. Smith, M. A. Smith, W. L. Waldron, and R. L. White **1995**, The IUE MEGA Campaign: Wind

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December 2011

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