Drew M. Miles

Research Assistant Professor

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Education

2018 – 2021 **PhD Astronomy & Astrophysics,** Penn State University
2016 – 2018 **MS Astronomy & Astrophysics,** Penn State University
2012 – 2015 **BS Physics, Astronomy,** University of Iowa

Postitions Held

2024 – · · · · **Research Assistant Professor,** Caltech
2022 – 2024 **Postdoctoral Researcher,** Caltech
2017 – 2021 **NASA Space Technology Research Fellow,** Penn State University
2016 – 2017 **Graduate Research Assistant,** Penn State University
2013 – 2016 **Undergraduate Research Assistant,** University of Iowa

Select Current Projects

The Faint Intergalactic-medium Redshifted Emission Balloon (FIREBall-2)
Period of Performance: 10/01/2022 – 09/30/2026
Project Funding: $4.9M; NASA APRA
Role: Project manager and technical lead for balloon-borne multiobject UV spectrograph.

Ultraviolet Spectroscopy ... Enabled Through Nanofabrication Techniques
Period of Performance: 10/01/2022 – 09/30/2025
Project Funding: $200k Co-I funding; NASA SAT
Role: Co-I and proposal writer for UV reflection gratings development to enable future missions. Serve as calibration lead and am responsible for fabricating UV echelle gratings.

X-ray Reflection Gratings: Key Developments for the Next Decade
Period of Performance: 10/01/2023 – 09/30/2026
Project Funding: $114k Co-I funding; NASA APRA
Role: Co-I and calibration lead, responsible for beamline verification of diffraction efficiency and spectral resolution.

Observation Programs: 2023 – Present
Keck: 8 total nights (4 as PI)

Select Pending Projects

tREXS-2: The Rockets for Extended-source X-ray Spectroscopy
Period of Performance: 10/01/2024 – 09/30/2028
Project Funding: ≈$3.9M
Role: PI, Status: Submitted to 2023 NASA APRA solicitation

Techniques in blazed reflection gratings to enable next-generation spectroscopy
Period of Performance: 10/01/2024 – 09/30/2027
Project Funding: ≈$1.9M
Role: PI, Status: Submitted to 2023 NASA SAT solicitation

Teaching

Live Instruction

2020 — Instructor, Astronomy Communication (ASTRO 297), Penn State University
SRTE Instructor Effectiveness: Mean = 6.9/7
SRTE Course Effectiveness: Mean = 6.6/7

2019 — Guest Lecturer, Astronomical Universe (ASTRO 001), Penn State University

2016 — TA and Lab Lead, Observational Astronomy (ASTRO 320), Penn State University

Workshops and Certifications

2024 — Workshop: How Learning Works

Workshop: How to Increase Student Engagement and Promote Academic Integrity

2023 — Workshop: The Effects of Stereotypes and Deficit Mindset on Learning

Workshop: Flipped Classrooms: Effective Active Learning in Large Classes

Workshop: Creating Dynamic and Engaging Lectures

2022 — Workshop: Setting Intentions for Student Learning

Workshop: Assessment as a Learning Tool

Workshop: Increasing Student Engagement and Motivation

2020 — Certificate in Online Teaching

Student Advising

Graduate Students

2022 – ... — Xihan Deng, FIREBall optical data analysis pipeline

2020 – ... — Ross McCurdy, tREXS sounding rocket project

Undergraduate Students

2022 – 2023 — Vincent Smedile, Thesis: *"Soft X-ray Source Modeling of the Cygnus Loop..."*
Outcome: Honor's thesis, graduate school in Astronomy

2020 – 2021 — Natalie Zinski, *tREXS instrument modeling*
Outcome: Position in industry

2019 – 2021 — Logan Baker, *tREXS opto-mechanical design*
Outcome: Graduate school in Aerospace Engineering

2018 – 2020 — Joseph Weston, *tREXS mechanical design*
Outcome: Position in industry

2017 – 2018 — Christopher Hillman, *Sounding rocket telemetry systems*
Outcome: Position in industry

2016 – 2017 — Tyler Steiner, *Nanofabrication and data analysis*
Outcome: Graduate school in Nuclear Engineering

Select Outreach & Service

2024 - ...	Co-Chair, HWO DEIA Sub WG
	Co-lead, HWO UV Tech Grating Focus Group
2023 - ...	Co-Chair, Astrophysics with Equity SAG Student Training Programs WG
	Deputy Secretary, AAS HEAD
	Member, HWO UV Tech WG
	Member, NASA New Great Observatories SAG
	Member, NASA Astrophysics with Equity SAG
2022 - ...	Mentor, Caltech Future Ignited
	Reviewer, JATIS
	Reviewer, NASA APRA
2015 - ...	Member, AAS and SPIE
2022 - 2023	Divisional Representative, Caltech Postdoctoral Association
2020 - 2021	Mentor, Rockets for Inclusive Science Education
	Co-Organizer & Moderator, Graduate Student Info Panel & Town Halls
	Department Representative, Penn State Graduate Students
2017 - 2021	Treasurer, Astronomy on Tap State Colleg
	Member, Lynx Instrument WG
2018 - 2020	Co-Chair, Graduate Student Recruitment for PSU Astronomy
	Co-Chair, Graduate Program for PSU Astronomy
2019	Judge, AAS Chambliss Student Poster Competition
2018	Reviewer, PSU College of Engineering Reserach Symposium
2017	Organizer, PSU Science Leadership Camp Research Snapshot

Select Awards

2022 - 2023	Presidential Management Fellow, U.S. Office of Personnel Management
2017 - 2021	NASA Space Technology Research Fellow, NASA
2021	Rising Star in Aerospace, MIT/Stanford/CU-Boulder Rising Stars Program
2019 - 2020	Downsbrough Graduate Fellowship for Outstanding Success, Penn State University
2017 - 2018	PA Space Grant Graduate Fellowship, NASA
2017	Newport Award for Outstanding Achievement, SPIE
2016	Braddock/Roberts Fellowship, Penn State University
2015	Fellow, Iowa Center for Research by Undergraduates, University of Iowa

Technical Presentations

2024	AAS 243rd Meeting, *FIREBall-2(023): The 2023 Flight of the Faint Intergalactic-medium Redshifted Emission Balloon* - Poster
2023	Invited - Pasadena City College, *Diffraction grating nanofabrication for astronomy instruments*
	Invited - NASA UV Program Review, *The Faint Intergalactic-medium Redshifted Emission Balloon*

Technical Presentations (continued)

- NASA Scientific Ballooning Workshop, *FIREBall-2: The Faint Intergalactic-medium Redshifted Emission Balloon* - Poster
- AAS 241st Meeting, *FIREBall-2: The Faint Intergalactic-medium Redshifted Emission Balloon*
- Invited - Marshall Space Flight Center, *Grating spectrographs for extended-source X-ray astronomy*

2022
- Astronomical X-ray Optics Workshop, *An extended-source grating spectrograph for suborbital rockets and small satellites*
- NASA Sounding Rockets Symposium, *The Rockets for Extended-source X-ray Spectroscopy* - Poster
- Invited - Astronomical Society of Long Island, *Observing diffuse astronomical sources of high-energy emission with suborbital instruments*
- Invited - Montana State University, *Enabling new observations of diffuse astrophysical emission with state-of-the-art grating technology*
- Invited - NASA JPL Microdevices Seminar, *Reflection grating fabrication for space-based astronomy*
- AAS HEAD 19, *The Rockets for Extended-source X-ray Spectroscopy*

2021
- SPIE Optics & Photonics, *An update on the Rockets for Extended-source X-ray Spectroscopy*
- Invited - The University of Iowa Astrophysics Seminar, *The Rockets for Extended-source X-ray Spectroscopy*

2020
- Invited - The Penn State Extraterrestrial Intelligence Center, *Potential UV/X-ray SETI Applications*
- AAS 235th Meeting, *Astronomical X-ray reflection gratings and the Rockets for Extended-source X-ray Spectroscopy* - Poster

2019
- SPIE Optics & Photonics, *The Rocket for Extended-source X-ray Spectroscopy*
- Cornell University NanoScale Facilities Annual Meeting, *Nanofabrication of Astronomical Reflection Gratings* - Poster
- SPIE Advanced Lithography, *Blazed x-ray reflection gratings using electron-beam lithography and ion milling*
- AAS 233rd Meeting, *The Lynx X-ray reflection grating spectrometer*
- AAS 233rd Meeting, *Progress in X-ray reflection grating development* - Poster

2018
- Astronomical X-ray Optics Workshop, *A diffuse soft X-ray spectrometer for sounding rocket* - Poster
- SPIE Astronomical Telescopes, *The Water Recovery X-ray Rocket* - Poster
- AAS 231st Meeting, *An update on X-ray reflection gratings*

2017
- SPIE Optics & Photonics, *An introduction to the Water Recovery X-ray Rocket*
- Penn State University Astrophysics Seminar, *Diffraction efficiency of a large-scale, replicated X-ray reflection grating*
- Invited - Penn State University Black Holes Workshop, *Suborbital rockets for X-ray astronomy*
- Invited - Penn State Unviversity Board of Visitors, *Penn State's sounding rocket program*
- Invited - Central Pennsylvania Observers, *X-ray astronomy and Penn State's sounding rocket program*
- AAS HEAD 16th Meeting, *The Water Recovery X-ray Rocket* - Poster
- AAS 229th Meeting, *Diffraction efficiency of a replicated, flight-like off-plane reflection grating baselined for future X-ray missions*

2016
- Invited - The Open University Astrophysics Seminar, *Low-cost, spaceborne soft X-ray astronomy missions*
- AAS HEAD 15th Meeting, *HaloSat: a CubeSat to map the distribution of baryonic matter in the Galactic halo* - Poster

Technical Presentations (continued)

2015
- SPIE Optics & Photonics, *Diffraction efficiency of radially-profiled off-plane reflection gratings*
- Iowa Undergraduate Research Festival, *Off-plane X-ray diffraction grating performance and applications*

Publications – [ORCID]

In Progress

1. **D. M. Miles**, R. L. McEntaffer, J. H. Tutt, *et al.*, "The first flight of the Rockets for Extended-source X-ray Spectroscopy," 2024.
2. **D. M. Miles**, V. Picouet, D. C. Martin, D. Schiminovich, E. Hamden, and K. Hoadley, "The Faint Intergalactic-medium Redshifted Emission Balloon 2023 Flight," 2024.
3. **D. M. Miles**, R. L. McEntaffer, J. H. Tutt, *et al.*, "Design of the Rockets for Extended-source X-ray Spectroscopy," 2024.

Journal Articles - 19; 2 first author, 8 with significant contribution

1. T. Brendel, A. Khan, S. Agarwal, *et al.*, "Balloon-borne FIREBall-2 ultraviolet spectrograph stray light control based on nonsequential reverse modeling of on-sky data," *Journal of Astronomical Telescopes, Instruments, and Systems*, vol. 8, 048001, p. 048 001, Oct. 2022. DOI: 10.1117/1.JATIS.8.4.048001.
2. K. France, B. Fleming, A. Youngblood, *et al.*, "Extreme-ultraviolet Stellar Characterization for Atmospheric Physics and Evolution mission: motivation and overview," *Journal of Astronomical Telescopes, Instruments, and Systems*, vol. 8, 014006, p. 014 006, Jan. 2022. DOI: 10.1117/1.JATIS.8.1.014006. arXiv: 2201.13219 [astro-ph.IM].
3. N. Kruczek, **D. M. Miles**, B. Fleming, *et al.*, "High efficiency echelle gratings for the far ultraviolet," *Applied Optics*, vol. 61, no. 22, p. 6430, Aug. 2022. DOI: 10.1364/AO.461537. arXiv: 2207.07659 [astro-ph.IM].
4. M. Urban, O. Nentvich, T. Báča, *et al.*, "REX: X-ray experiment on the water recovery rocket," *Acta Astronautica*, vol. 184, pp. 1–10, Jul. 2021. DOI: 10.1016/j.actaastro.2021.03.019. arXiv: 2011.10072 [astro-ph.IM].
5. D. M. LaRocca, P. Kaaret, D. L. Kirchner, *et al.*, "Design and construction of the x-ray instrumentation onboard the HaloSat CubeSat," *Journal of Astronomical Telescopes, Instruments, and Systems*, vol. 6, 014003, p. 014 003, Jan. 2020. DOI: 10.1117/1.JATIS.6.1.014003.
6. J. A. McCoy, R. L. McEntaffer, and **D. M. Miles**, "Extreme Ultraviolet and Soft X-Ray Diffraction Efficiency of a Blazed Reflection Grating Fabricated by Thermally Activated Selective Topography Equilibration," *The Astrophysical Journal*, vol. 891, no. 2, 114, p. 114, Mar. 2020. DOI: 10.3847/1538-4357/ab76d3. arXiv: 2003.06449 [astro-ph.IM].
7. J. A. McCoy, M. A. Verschuuren, **D. M. Miles**, and R. L. McEntaffer, "X-ray verification of sol-gel resist shrinkage in substrate-conformal imprint lithography for a replicated blazed reflection grating," *OSA Continuum*, 3(11), pp. 3141–3156, Oct. 2020. DOI: 10.48550/arXiv.2011.14771.
8. R. C. McCurdy, **D. M. Miles**, J. A. McCoy, F. Grisé, and R. L. McEntaffer, "Diffraction efficiency of a small-period astronomical x-ray reflection grating fabricated using thermally activated selective topography equilibration," *Journal of Astronomical Telescopes, Instruments, and Systems*, vol. 6, 045003, p. 045 003, Oct. 2020. DOI: 10.1117/1.JATIS.6.4.045003.

9. T. Rogers, R. McEntaffer, J. McCoy, **D. M. Miles**, T. Schultz, and J. Tutt, "Induced X-ray fluorescence background for high-voltage space based detectors," *Experimental Astronomy*, vol. 49, no. 1-2, pp. 1–20, Jan. 2020. DOI: 10.1007/s10686-019-09649-5.

10. P. Kaaret, A. Zajczyk, D. M. LaRocca, *et al.*, "HaloSat: A CubeSat to Study the Hot Galactic Halo," *The Astrophysical Journal*, vol. 884, no. 2, 162, p. 162, Oct. 2019. DOI: 10.3847/1538-4357/ab4193. arXiv: 1909.13822 [astro-ph.IM].

11. **D. M. Miles**, S. V. Hull, T. B. Schultz, *et al.*, "Water Recovery X-Ray Rocket grating spectrometer," *Journal of Astronomical Telescopes, Instruments, and Systems*, vol. 5, 044006, p. 044 006, Oct. 2019. DOI: 10.1117/1.JATIS.5.4.044006.

12. J. H. Tutt, R. L. McEntaffer, **D. M. Miles**, B. D. Donovan, and C. Hillman, "Grating Alignment for the Water Recovery X-Ray Rocket (WRXR)," *Journal of Astronomical Instrumentation*, vol. 8, no. 3, 1950009, p. 1 950 009, Jan. 2019. DOI: 10.1142/S2251171719500090.

13. **D. M. Miles**, J. A. McCoy, R. L. McEntaffer, *et al.*, "Fabrication and Diffraction Efficiency of a Large-format, Replicated X-Ray Reflection Grating," *The Astrophysical Journal*, vol. 869, no. 2, 95, p. 95, Dec. 2018. DOI: 10.3847/1538-4357/aaec73.

14. T. Rogers, R. McEntaffer, T. Schultz, J. McCoy, **D. Miles**, and J. Tutt, "Gaseous electron multiplier gain characteristics using low-pressure Ar/CO_2," *Experimental Astronomy*, vol. 43, no. 2, pp. 201–210, Apr. 2017. DOI: 10.1007/s10686-017-9531-8.

15. C. T. DeRoo, R. L. McEntaffer, **D. M. Miles**, *et al.*, "Line spread functions of blazed off-plane gratings operated in the Littrow mounting," *Journal of Astronomical Telescopes, Instruments, and Systems*, vol. 2, 025001, p. 025 001, Apr. 2016. DOI: 10.1117/1.JATIS.2.2.025001. arXiv: 1603.04839 [astro-ph.IM].

16. H. Marlowe, R. L. McEntaffer, J. H. Tutt, *et al.*, "Modeling and empirical characterization of the polarization response of off-plane reflection gratings," *Applied Optics*, vol. 55, no. 21, p. 5548, Jul. 2016. DOI: 10.1364/AO.55.005548.

17. J. McCoy, T. Schultz, J. Tutt, T. Rogers, **D. Miles**, and R. McEntaffer, "A Primer for Telemetry Interfacing in Accordance with NASA Standards Using Low Cost FPGAs," *Journal of Astronomical Instrumentation*, vol. 5, no. 1, 1640002, p. 1 640 002, Dec. 2016. DOI: 10.1142/S225117171640002X. arXiv: 2203.11913 [astro-ph.IM].

18. J. H. Tutt, R. L. McEntaffer, H. Marlowe, *et al.*, "Diffraction Efficiency Testing of Sinusoidal and Blazed Off-Plane Reflection Gratings," *Journal of Astronomical Instrumentation*, vol. 5, no. 3, 1650009, p. 1 650 009, Sep. 2016. DOI: 10.1142/S2251171716500094.

19. H. Marlowe, R. L. McEntaffer, R. Allured, *et al.*, "Performance testing of an off-plane reflection grating and silicon pore optic spectrograph at PANTER," *Journal of Astronomical Telescopes, Instruments, and Systems*, vol. 1, 045004, p. 045 004, Oct. 2015. DOI: 10.1117/1.JATIS.1.4.045004. arXiv: 1503.05809 [astro-ph.IM].

Conference Proceedings - 24; 6 first author, 7 with significant contribution

1. **D. M. Miles**, R. L. McEntaffer, and F. Grisé, "Blazed reflection gratings with electron-beam lithography and ion-beam etching," in *Space Telescopes and Instrumentation 2022: Ultraviolet to Gamma Ray*, J.-W. A. den Herder, S. Nikzad, and K. Nakazawa, Eds., ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 12181, Aug. 2022, 1218153, p. 1 218 153. DOI: 10.1117/12.2637880.

2. V. Picouet, D. Valls-Gabaud, B. Milliard, *et al.*, "FIREBall-2: flight preparation of a proven balloon payload to image the intermediate redshift circumgalactic medium," Nov. 2022, 25th ESA PAC Symposium. DOI: 10.48550/arXiv.2211.15491. arXiv: 2211.15491 [astro-ph.IM].

3. B. T. Fleming, K. France, T. Hellickson, *et al.*, "Opto-mechanical design of the ESCAPE Small Explorer: an EUV spectrograph for exoplanet host star irradiance and CME activity," in *UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXII*, O. H. Siegmund, Ed., ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 11821, Aug. 2021, 1182104, p. 1 182 104. DOI: 10.1117/12.2593732.

4. K. France, B. Fleming, A. Youngblood, *et al.*, "The ESCAPE mission overview: exploring the stellar drivers of exoplanet habitability," in *UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXII*, O. H. Siegmund, Ed., ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 11821, Aug. 2021, 1182103, p. 1 182 103. DOI: 10.1117/12.2593814.

5. F. Grisé, N. Kruczek, B. Fleming, *et al.*, "Fabrication of custom astronomical gratings for the extreme and far ultraviolet bandpasses," in *UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXII*, O. H. Siegmund, Ed., ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 11821, Aug. 2021, 1182112, p. 1 182 112. DOI: 10.1117/12.2594796.

6. N. Kruczek, F. Grisé, **D. M. Miles**, *et al.*, "Performance of anisotropically-etched gratings in the extreme and far ultraviolet bandpasses," in *UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXII*, O. H. Siegmund, Ed., ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 11821, Aug. 2021, 118210X, p. 118210X. DOI: 10.1117/12.2593609.

7. **D. M. Miles**, J. H. Tutt, R. McCurdy, *et al.*, "An update on the rockets for extended-source X-ray spectroscopy," in *UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXII*, O. H. Siegmund, Ed., ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 11821, Aug. 2021, 118210K, 118210K. DOI: 10.1117/12.2594291.

8. J. H. Tutt, **D. M. Miles**, R. McEntaffer, *et al.*, "Developments of the focal plane camera for tREXS," in *UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXII*, O. H. Siegmund, Ed., ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 11821, Aug. 2021, 118210V, p. 118210V. DOI: 10.1117/12.2594563.

9. K. France, B. Fleming, A. Youngblood, *et al.*, "EUV spectroscopy with the ESCAPE mission: exploring the stellar drivers of exoplanet habitability," in *Space Telescopes and Instrumentation 2020: Ultraviolet to Gamma Ray*, J.-W. A. den Herder, S. Nikzad, and K. Nakazawa, Eds., ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 11444, Dec. 2020, 1144405, p. 1 144 405. DOI: 10.1117/12.2560292.

10. K. France, B. T. Fleming, J. J. Drake, *et al.*, "The extreme-ultraviolet stellar characterization for atmospheric physics and evolution (ESCAPE) mission concept," in *UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXI*, O. H. Siegmund, Ed., ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 11118, Sep. 2019, 1111808, p. 1 111 808. DOI: 10.1117/12.2526859.

11. P. Kaaret, A. Zajczyk, and e. a. LaRocca Daniel, "First Results from HaloSat - A CubeSat to Study the Hot Galactic Halo," in *Proc. of AIAA/USU*, ser. Conference on Small Satellites, Upcoming Missions, Year in Review I, vol. SSC19-III-05, 2019. URL: https://digitalcommons.usu.edu/smallsat/2019/all2019/277/.

12. R. C. McCurdy, R. L. McEntaffer, J. A. McCoy, and **D. M. Miles**, "Fabrication and diffraction efficiency of a 160-nm period x-ray reflection grating produced using thermally activated selective topography equilibration," in *Optics for EUV, X-Ray, and Gamma-Ray Astronomy IX*, S. L. O'Dell and G. Pareschi, Eds., ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 11119, Sep. 2019, 111190Y, 111190Y. DOI: 10.1117/12.2530052.

13. **D. M. Miles**, R. M. McEntaffer, J. H. Tutt, *et al.*, "An introduction to the Rockets for Extended-source X-ray Spectroscopy," in *UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXI*, O. H. Siegmund, Ed., ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 11118, Sep. 2019, 111180B, 111180B. DOI: 10.1117/12.2529567.

14. J. H. Tutt, **D. M. Miles**, R. M. McEntaffer, T. Anderson, M. Weiss, and B. C. O'Meara, "The focal plane camera for tREXS," in *UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXI*, O. H. Siegmund, Ed., ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 11118, Sep. 2019, 111180C, p. 111180C. DOI: 10.1117/12.2529555.

15. M. Wages, S. V. Hull, A. D. Falcone, *et al.*, "Flight camera package design, calibration, and performance for the Water Recovery X-ray Rocket mission," in *UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXI*, O. H. Siegmund, Ed., ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 11118, Sep. 2019, 111180D, p. 111180D. DOI: 10.1117/12.2529361.

16. **D. M. Miles**, R. L. McEntaffer, B. D. Donovan, *et al.*, "Grating design for the Water Recovery X-ray Rocket," in *Space Telescopes and Instrumentation 2018: Ultraviolet to Gamma Ray*, J.-W. A. den Herder, S. Nikzad, and K. Nakazawa, Eds., ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 10699, Jul. 2018, 106996K, 106996K. DOI: 10.1117/12.2312648.

17. **D. M. Miles**, R. L. McEntaffer, T. B. Schultz, *et al.*, "An introduction to the water recovery x-ray rocket," in *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, O. H. Siegmund, Ed., ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 10397, Aug. 2017, 103970R, 103970R. DOI: 10.1117/12.2274249.

18. J. E. Hill, J. K. Black, K. Jahoda, *et al.*, "The x-ray polarimeter instrument on board the Polarimeter for Relativistic Astrophysical X-ray Sources (PRAXyS) mission," in *Space Telescopes and Instrumentation 2016: Ultraviolet to Gamma Ray*, J.-W. A. den Herder, T. Takahashi, and M. Bautz, Eds., ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 9905, Jul. 2016, 99051B, 99051B. DOI: 10.1117/12.2233322.

19. H. Marlowe, R. L. McEntaffer, C. T. DeRoo, *et al.*, "Polarization sensitivity testing of off-plane reflection gratings," in *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 9603, Sep. 2015, 960318, p. 960 318. DOI: 10.1117/12.2186344.

20. J. McCoy, T. Schultz, J. Tutt, T. Rogers, **D. Miles**, and R. McEntaffer, "A primer for telemetry interfacing in accordance with NASA standards using low cost FPGAs," in *UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XIX*, O. H. Siegmund, Ed., ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 9601, Aug. 2015, 960106, p. 960 106. DOI: 10.1117/12.2186455.

21. **D. M. Miles**, J. H. Tutt, C. T. DeRoo, *et al.*, "Diffraction efficiency of radially-profiled off-plane reflection gratings," in *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 9603, Sep. 2015, 960316, p. 960 316. DOI: 10.1117/12.2186842.

22. T. J. Peterson, C. T. DeRoo, H. Marlowe, *et al.*, "Off-plane x-ray reflection grating fabrication," in *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 9603, Sep. 2015, 960317, p. 960 317. DOI: 10.1117/12.2188302.

23. T. Rogers, T. Schultz, J. McCoy, **D. Miles**, J. Tutt, and R. McEntaffer, "First results from the OGRESS sounding rocket payload," in *UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XIX*, O. H. Siegmund, Ed., ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 9601, Sep. 2015, 960104, p. 960 104. DOI: 10.1117/12.2183237.

24. J. H. Tutt, R. L. McEntaffer, C. DeRoo, *et al.*, "Developments in the EM-CCD camera for OGRE," in *High Energy, Optical, and Infrared Detectors for Astronomy VI*, A. D. Holland and J. Beletic, Eds., ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 9154, Jul. 2014, 91540E, 91540E. DOI: 10.1117/12.2054872.