Ryan Christopher Felton

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EDUCATION

Ph.D. in Physics May 2021
The Catholic University of America
Dissertation: The Titan Laboratory: Studies of Hazy and Reducing Atmospheres Near and Far
Advisor: Dr. Shawn Domagal-Goldman

M.S. in Physics Fall 2015 - Spring 2019
The Catholic University of America
Advisor: Dr. Shawn Domagal-Goldman

B.S. in Physics & B.S. in Astronomy Fall 2010 - Spring 2014
University of Maryland - College Park

EMPLOYMENT

NASA Ames Research Center February 2024 - Present
NASA Postdoctoral Management Program (NPMP) Fellow
Advisor: Dr. Caleb Scharf

Bay Area Environmental Research Institute July 2023 - February 2024
NASA Ames Research Center
Planetary Scientist

NASA Ames Research Center July 2021 - July 2023
NASA Postdoctoral Program (NPP) Fellow
Advisor: Dr. Chester "Sonny" Harman

Washington Latin Public Charter School August 2014 - June 2015
High School Physics Teacher

Science Applications International Corporation April 2007 - July 2010
Maritime Intelligence Analyst

United States Air Force August 2002 - August 2006
Intelligence Analyst, Senior Airmen E-4

RESEARCH INTERESTS

- Reducing and oxidizing terrestrial planet atmospheres
- Photochemical haze production and its affect on biosignature detection and habitability
- False positive biosignatures in spectra of terrestrial exoplanets
- Titan and Titan as an analog for terrestrial exoplanets
- The search for technosignatures (radio and non-radio)

GRANTS AWARDED

- 07/01/2023 - 07/01/2026, Titan as an Exoplanet: Identifying key observational signatures of Titan-like exoplanets, NASA NRA #: NNH22ZDA001N-XRP, Co-Investigator
- 01/01/2017 - 09/30/2019, No One's Home: the Fate of Carbon on Lifeless Earths, NASA NRA #: NNH16ZDA001N-XRP, Co-Investigator (grant extended to 2022)

PUBLICATIONS

FIRST AUTHORED PAPERS

- R. Felton, S. Bastelberger, K. Mandt, A. Luspay-Kuti, T. Fauchez, & S. Domagal-Goldman. (2022) "The Role of Atmospheric Exchange in False-Positive Biosignature Detection". Journal of Geophysical Research: Planets, 127, e2021JE006853. https://doi.org/10.1029/2021JE006853
- R. Felton, P. Gao, J. Lora, S. Bastelberger, G. Arney, G. Villaneuva, E. Hebrard & S. Domagal-Goldman. "Barnard's Star B as an Analog for Titan-like Exoplanets". *In Preparation*
- R. Felton & C.E. Harman "Temperate Venuses: CO_2's Role in Extending the Outer Edge of the Conventional Habitable Zone". *In Preparation*

CO-AUTHORED PAPERS

- M. Neveu, T. Bartlow, R. Felton, S. Domagal-Goldman & S. Desch. "Geophysical and geochemical controls on abiotic carbon cycling on Earth-like planets". *In Preparation*
- J. Haqq-Misra, E. Schwieterman, H. Socas-Navarro, R. Kopparapu, D. Angerhausen, T. Beatty, S. Berdyugina, R. Felton, S. Sharma, G. De La Torre & TechnoClimes 2020 Workshop Participants. "Searching for Technosignatures in Exoplanetary Systems with Current and Future Missions". Acta Astronautica, Volume 198, 2022, Pages 194-207, https://doi.org/10.1016/j.actaastro.2022.05.040
- Mandt, K., Luspay-Kuti, A., Lustig-Yaeger, J., Felton, R., & Domagal-Goldman, S. (2022). "TRAPPIST-1h as an Exo-Titan. I. The Role of Assumptions about Atmospheric Parameters in Understanding an Exoplanet Atmosphere." The Astrophysical Journal, 930(1), 73. 2022 May 4, https://doi.org/10.3847/1538-4357/ac59bb
- C.E. Harman, R. Felton, R. Hu, S. Domagal-Goldman, A. Segura, F. Tian, & J. F. Kasting. (2018) "Abiotic O_2 Levels on Planets around F, G, K and M Stars: Effects of Lightning-produced Catalysts in Eliminating Oxygen False Positives", ApJ, 866:56, 2018 October 10, https://doi.org/10.3847/1538-4357/aadd9b

CONFERENCE PRESENTATIONS

INVITED TALKS

- R. Felton, C.E. Harman, K. Mandt, P. Gao, J, Lora, E. Hebrard, G. Villanueva, S. Domagal-Goldman. (2023) "Photochemical Modeling and Spectra of Titan-like Worlds", Space Science & Astrobiology Division Seminar Series, NASA Ames Research Center Mountain View, CA.
- R. Felton, S. Bastelberger, K. Mandt, A. Luspay-Kuti, T. Fauchez, S. Domagal-Goldman, C.E. Harman. (2023) "The Role of Atmospheric Exchange in False-

Positive Biosignature Detection", Astrobiology Seminar, University of California - Riverside, CA

- R. Felton, S. Domagal-Goldman, G. Arney, P. Gao, J. Lora, G. Villaneuva (2019). "Study of Barnard's Star B as an Analog for Titan-like Exoplanets", Exoplanet Seminar, NASA Goddard Greenbelt, MD

CONTRIBUTED TALKS

- R. Felton, C.E. Harman, "Temperate Venuses: Does CO_2 affect the habitability of terrestrial planets outside the conventional habitable zone?", Exoplanets in Our Backyard 2, Albuquerque, NM
- R. Felton, C.E. Harman, "Temperate Venuses: Does CO_2 affect the habitability of terrestrial planets outside the conventional habitable zone?", AAS240, 2022, Pasadena, CA
- R. Felton, S. Bastelberger, K. Mandt, A. Luspay-Kuti, T. Fauchez, & S. Domagal-Goldman, "The Role of Atmospheric Exchange in False-Positive Biosignature Detection", AbSciCon 2022, Atlanta, GA
- R. Felton, S. Bastelberger, M. Neveu, S. Domagal-Goldman, G. Arney, P. Gao, J. Lora, G. Villaneuva, E. Hebrard (2020). "Barnard's Star B as an Analog for Titan-like Exoplanets". Planets2020, Santiago, Chile
- R. Felton, S. Bastelberger, G. Arney, S. Domagal-Goldman, M. Neveu, E. Hebrard (2020). "Photochemical Modeling of Titan-like Exoplanets". Winter AAS Meeting, Honolulu, HI
- R. Felton, S. Domagal-Goldman, G. Arney, P. Gao, J. Lora, G. Villaneuva (2019). "Study of Barnard's Star B as an Analog for Titan-like Exoplanets". Early Career Fair, NASA Goddard Greenbelt, MD
- R. Felton, S. Domagal-Goldman, G. Arney, P. Gao, J. Lora, G. Villaneuva (2019). "Study of Barnard's Star B as an Analog for Titan-like Exoplanets". AbGradCon 2019, Salt Lake City, UT

POSTERS

- R. Felton, S. Bastelberger, S. Domagal-Goldman, G. Arney, M. Neveu, P. Gao, J. Lora, G. Villaneuva, E. Hebrard (2023). "Investigating Benzene Formation in Photochemical Modeling - Titan". Exoclimes VI, University of Exeter, UK
- R. Felton, S. Bastelberger, S. Domagal-Goldman, G. Arney, M. Neveu, P. Gao, J. Lora, G. Villaneuva, E. Hebrard (2020). "Photochemical Modeling of Titan-like Exoplanets". Exoplanets in Our Backyard, LPI Houston, TX
- R. Felton, S. Domagal-Goldman, G. Arney, P. Gao, J. Lora, G. Villaneuva (2019). "Study of Barnard's Star B as an Analog for Titan-like Exoplanets". SEEC JWST Symposium, NASA Goddard Space Flight Center Greenbelt, MD
- R. Felton, M. Neveu, S. Domagal-Goldman, G. Arney, P. Gao, J. Lora, G. Villaneuva, S. Desch (2019). "Terrestrial Exoplanet Studies: Home & Abroad". AbSciCon 2019, Bellevue, WA
- R. Felton, M. Neveu, S. Domagal-Goldman, G. Arney, P. Gao, J. Lora, G. Villaneuva, S. Desch (2019). "Terrestrial Exoplanet Studies: Home & Abroad". Winter AAS Meeting 2019, Seattle, WA
- R. Felton, M. Neveu, S. Domagal-Goldman, S. Desch, G. Arney (2018). "Studying Abiotic Terrestrial Planets With Atmospheric-Geological Model Coupling". AGU Fall Meeting 2018, Washington, D.C.

- R. Felton, M. Neveu, S. Domagal-Goldman, S. Desch, G. Arney (2018). "Comparative Photochemistry of Lifeless Terrestrial Planets". CCTP3 2018, LPI Houston, TX
- R. Felton, M. Neveu, S. Domagal-Goldman, S. Desch, G. Arney (2018). "Developing Tighter Constraints on Exoplanet Biosignatures by Modeling Atmospheric Haze". Winter AAS Meeting 2018, National Harbor, MD
- R. Felton, M. Neveu, S. Domagal-Goldman, S. Desch, G. Arney (2017). "Developing Tighter Constraints on Exoplanet Biosignatures by Modeling Atmospheric Haze". AGU Fall Meeting 2017, New Orleans, LA
- R. Felton, M. Neveu, S. Domagal-Goldman, S. Desch (2017). "No One's Home: the Fate of Carbon on Lifeless Earths". AbSciCon 2017, Mesa, AZ

PROFESSIONAL ACTIVITIES & SERVICES

Professional Development

- NASA Science Mission Design - Planetary Science Summer School, 2023, Jet Propulsion Laboratory, Pasadena, CA
- Cooperative Institute for Dynamic Earth Research (CIDER) Summer Program, 2022, University of California, Berkeley
- NExSS Arizona Winter School, 2016, Biosphere 2, Oracle, AZ

Panels & Reviews

- 2023 science panel review
- Referee for *MNRAS*

Conference Organization

- Served on the science organizing committee for the August 2020 TechnoClimes non-radio technosignature workshop

PRESS

- R. Felton responses to David Axe Q & A (June 10, 2022). "The Alien Hunter's Playbook Is Getting a Cutting-Edge Rewrite". The Daily Beast, https://www.thedailybeast.com/scientists-are-rewriting-the-alien-hunting-playbook-to-redefine-signs-of-life
- R. Felton interview by Nola Tyler Redd (March 26, 2020). "Future space telescopes may probe Titan-like exoplanets". Space.com, https://www.space.com/titan-like-exoplanets-future-space-telescopes.html