

Robert D Preece

Cumulative Curriculum Vitae

Spring 2012 - Spring 2021

256-961-7654

preece@uah.edu

Current Position

Current Academic Rank: Associate Professor

Contact Information

Office Number: 2005

Office Building: CRH

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Interests

Research Interests

Gamma-Ray Bursts: emission and acceleration theory and spectral data analysis;

Astrophysical Jets: emission and acceleration theory and numerical simulation;

Quantum Processes in Strong Magnetic Fields;

Neutron stars and Magnetars;

Quantum Gravity: Theory.

Degrees

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| 1990 | Ph.D., Physics, University of Maryland, College Park, Maryland, Dissertation: Nonthermal Synchrotron Pair Cascades in Strong Magnetic Fields: A Gamma-ray Burst Emission Model |
| 1985 | M.S., Physics, Ohio State University, Columbus, Ohio, United States |
| 1982 | B.A., Mathematics and Physics, University of California, Berkeley, Berkeley, California, United States |

Work Experience

2010 - 2013

Associate Professor, UAH, 2013

2005 - 2010

Associate Research Professor, UAH, 2010

2001 - 2005

Assistant Research Professor, UAH, 2005

1993 - 2001

Senior Research Associate, UAH, 2001

1990 - 1993

NRC Resident Research Associate, NASA Marshall Space Flight Center, Huntsville, Alabama, 1993

Scholarly Contributions and Creative Productions

Journal Publication

Refereed:

Ajello M., Arimoto M., Axelsson M., Baldini L., Barbiellini G., Bastieri D., Bellazzini R., et al., (2020). Fermi and Swift Observations of GRB 190114C: Tracing the Evolution of High-energy Emission from Prompt to Afterglow. *The Astrophysical Journal*, 890, 9.

Hamburg R., Fletcher C., Burns E., Goldstein A., Bissaldi E., Briggs M. S., Cleveland W. H., et al., (2020). A Joint Fermi-GBM and LIGO/Virgo Analysis of Compact Binary Mergers from the First and Second Gravitational-wave Observing Runs. *The Astrophysical Journal*, 893, 100.

von Kienlin, A.; Meegan, C. A.; Paciesas, W. S.; Bhat, P. N.; Bissaldi, E.; Briggs, M. S.; ... Preece, R. (2020). The Fourth Fermi-GBM Gamma-Ray Burst Catalog: A Decade of Data. *The Astrophysical Journal*, 893, 46.

Burns, E., Goldstein, A., Hui, C. M., Blackburn, L., Briggs, M. S., Connaughton, V., ... Preece, R. (2019). A Fermi Gamma-Ray Burst Monitor Search for Electromagnetic Signals Coincident with Gravitational-wave Candidates in Advanced LIGO's First Observing Run. *The Astrophysical Journal*, 871(1), 90.

Veres, P., Dal Canton, T., Burns, E., Goldstein, A., Littenberg, T. B., Christensen, N., & Preece, R. D. (2019). Fermi-GBM Follow-up of LIGO-Virgo Binary Black Hole Mergers: Detection Prospects. *The Astrophysical Journal*, 882(1), 53.

von Kienlin, A., Veres, P., Roberts, O. J., Hamburg, R., Bissaldi, E., Briggs, M. S., ... Preece, R. (2019). Fermi-GBM GRBs with Characteristics Similar to GRB 170817A. *The Astrophysical Journal*, 876(1), 89.

- Acciari, V. A., Ansoldi, S., Antonelli, L. A., Engels, A. A., Baack, D., Babi{'c}, A., ... Preece, R. (2019). Observation of inverse Compton emission from a long gamma-ray burst. *Nature*, 575(7783), 459–463.
- Connaughton, V., Burns, E., Goldstein, A., Blackburn, L., Briggs, M. ~s., Christensen, N., ... Preece, R. (2018). On the Interpretation of the Fermi-GBM Transient Observed in Coincidence with LIGO Gravitational-wave Event GW150914. *The Astrophysical Journal Letters*, 853(1), L9.
- Veres, P., M{'esz'aros}, P., Goldstein, A., Fraija, N., Connaughton, V., Burns, E., ... Kocevski, D. (2018). Gamma-ray burst models in light of the GRB 170817A - GW170817 connection. *arXiv E-Prints*, arXiv:1802.07328.
- Goldstein, A., Veres, P., Burns, E., Blackburn, L., Briggs, M. S., Christensen, N., ... Preece. (2017). Fermi Observations of the LIGO Event GW170104. *The Astrophysical Journal Letters*, 846(1), L5.
- Abbott, B. ~p., Abbott, R., Abbott, T. ~d., Acernese, F., Ackley, K., Adams, C., ... al., et. (2017). Multi-messenger Observations of a Binary Neutron Star Merger. *The Astrophysical Journal Letters*, 848, L12.
- Abbott, B. P., Abbott, R., Abbott, T. D., Acernese, F., Ackley, K., Adams, C., ... Preece. (2017). Gravitational waves and gamma-rays from a binary neutron star merger: GW170817 and GRB 170817A. *The Astrophysical Journal Letters*, 848(2), L13.
- Goldstein, A., Veres, P., Burns, E., Briggs, M. S., Hamburg, R., Kocevski, D., ... others. (2017). An ordinary short gamma-ray burst with extraordinary implications: Fermi-GBM detection of GRB 170817A. *The Astrophysical Journal Letters*, 848(2), L14.
- Racusin, J. L., Burns, E., Goldstein, A., Connaughton, V., Wilson-Hodge, C. A., Jenke, P., ... Preece. (2017). Searching The Gamma-Ray Sky For Counterparts To Gravitational Wave Sources: Fermi Gamma-Ray Burst Monitor And Large Area Telescope Observations Of Lvt151012 And Gw151226. *The Astrophysical Journal*, 835(1), 82.
- Preece, R. D., Goldstein, A., Bhat, N., Stanbro, M., Hakkila, J., & Blalock, D. (2016). Which E_{peak}?-The Characteristic Energy of Gamma-Ray Burst Spectra. *The Astrophysical Journal*, 821.
- Connaughton, V., Burns, E., Goldstein, A., Blackburn, L., Briggs, M. S., Zhang, B., ... Preece. (2016). Fermi GBM observations of LIGO gravitational-wave event GW150914. *The Astrophysical Journal Letters*, 826(1), L6.

Presentations

- Preece, R. D. (2019, May). *The Fermi Gamma-Ray Burst Monitor in the Multi-Messenger Age. Gamma-Ray Bursts and Related Astrophysics in Multi-Messenger Era*. Nanjing University, Nanjing China.
- Preece, R. D. (2017, November). *An Ordinary Short Gamma-Ray Burst with Extraordinary Implications: Fermi-GBM Detection of GRB 170817A*. Colloquium: Wichita State University Physics/Fairmount Center for Science & Math Ed.
- Preece, R. D. (2017, December). *Fermi Gamma-Ray Burst Monitor Observations: Spectral and Temporal Evolution*. Contributed Talk: 29th International Texas Symposium on Relativistic Astrophysics.
- Preece, R. D. (2016, August). *Dark Matter*. NASA Faculty Fellow Seminar. MSFC : NASA/MSFC.

Proceedings Publication

Hakkila, J., & Preece, R. D. (2019). How pulses in short gamma-ray bursts constrain HMXRB evolution. In *IAU Symposium* (Vol. 346).

McConnell, M. L., Baring, M. G., Bloser, P. F., Briggs, M. S., Connaughton, V., Dwyer, J., ... Preece. (2017). LEAP-A Large Area GRB Polarimeter for the ISS (Vol. 16). AAS/High Energy Astrophysics Division.

Contracts and Grants

Completed

2016 MSFC Faculty Fellowship Program, Funded by NASA/MSFC (June 6, 2016 - August 12, 2016), awarded June 6, 2016 (\$17,000.00), Completed, Fall 2016, PI Robert Preece

Investigating the Low Energy Response of the Fermi LAT via an Energy Dispersion Analysis, Funded by NASA (May 6, 2010 - May 5, 2016), awarded June 14, 2010 (\$111,000.00), Completed, Fall 2016, PI Robert Preece

GEANT4 Detector Simulation Capability to Support Future UAH Astrophysics Mission Proposals, Funded by UAH Individual Investigator Distinguished Research (IIDR) Program (April 1, 2015 - March 31, 2016), awarded April 1, 2015 (\$36,750.00), Completed, Fall 2016, PI Robert Preece

Funded - In Progress

LEAP – LargeE Area burst Polarimeter, Funded by NASA (Subcontract through the University of New Hampshire) (April 24, 2020 - December 31, 2020), awarded March 16, 2020 (\$19,193.00), Funded - In Progress, Spring 2020, PI Robert Preece with CoInvestigator Michael Briggs, CoInvestigator Charles Meegan

Is There a Relation Between Prompt GRB Polarization and Spectral Parameters? Answers from Fermi-GBM ASTRSAT, Funded by NASA (October 1, 2017 - September 30, 2019), awarded July 1, 2017 (\$59,665.00), Funded - In Progress, Fall 2017, CoPI Robert Preece (1%) with CoPI Peter Veres

Directed Student Learning: Student Information

Summer 2019 - Spring 2020

Adam Smith, Space Science, 2020-03-11, MSc

Membership

American Physical Society, APS, January 2015, Ongoing

American Association for the Advancement of Science, AAAS, January 2013, January 2017

American Astronomical Society, AAS, January 1990, Ongoing

Honors

Fall 2019

S.T. Wu Award, 2019, Center for Space Plasma and Aeronomical Research, UAH

Spring 2018

Bruno Rossi Prize, 2018, High Energy Astrophysics Division of the American Astronomical Society,

Awarded to the Fermi GBM Team for the discovery of Gamma-rays coincident with a neutron-star merger gravitational wave event. This confirmed that short gamma-ray bursts are produced by binary neutron-star mergers and enabled a global multi-wavelength follow-up campaign, 2018, High Energy Astrophysics Division of the American Astronomical Society

Spring 2017

NASA Space Flight Awareness Team Award: Fermi Gamma-ray Burst Monitor Team, 2017, NASA