



## BIOGRAPHY – ANTHEA JANE COSTER

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### Professional Preparation

University of Texas at Austin	Austin, USA	Mathematics (Plan II, honors)	B.A. 1975
Rice University	Houston, USA	Space Physics and Astronomy	M.S. 1981
Rice University	Houston, USA	Space Physics and Astronomy	Ph.D. 1983

### Appointments

MIT Haystack Observatory, 2004 – present

Assistant Director, MIT Haystack Observatory, 2015 – present

Principal Research Scientist, MIT Haystack Observatory, 2012 – present

Research Scientist, MIT Haystack Observatory, 2004 – 2012

Technical Staff, MIT Lincoln Laboratory, 1984 – 2003

Research Scientist, Georgia Tech Research Institute, 1983 – 1984

**Relevant Experience** Focus of research is physics of the ionosphere, magnetosphere, and thermosphere, space weather and storm time effects, coupling of atmospheric regions, and GPS positioning and measurement accuracy. At MIT Lincoln Laboratory, oversaw the application of atmospheric and ionospheric models to problems in satellite tracking. Developed the first real-time ionospheric monitoring system based on GPS in 1991, involved with measuring atmospheric disturbances over short baselines (GPS networks smaller than 100 km) for the FAA, and coordinated meteor research using the ALTAIR dual-frequency radar for NASA. At Haystack, oversaw the development of the GNSS total electron content database, demonstrated the existence of mid-latitude storm enhanced density (SED) plumes and studied traveling ionospheric disturbances in both quiet and storm-time conditions. A connection between the lower and upper atmosphere has been established through the link observed between sudden stratospheric warmings and global changes in the TEC. Another project involved the use of mobile phones to download and process GPS data in the field, making it easy to quickly move and process data from remote locations. PI of the Haystack team for NASA's Extreme Storms project and PI for the NSF Monitors for Alaskan and Canadian Auroral Weather in Space (MACAWS) project, where 35 new GNSS receivers are being installed in remote locations in Northern Alaska and Canada.

### Recognitions

- American Geophysical Union, J. Bacon-Bercy Scholarship in Atmospheric Sciences for Women, 1978
- Award for best paper in Atmospheric Effects Session at ION GNSS conferences, 1991, 2006, 2017
- NASA Tech Briefs Innovation award (with R. Suggs, W. Cooke, P. Brown) for Meteor Properties Database, 2005
- Selected one of Fifty Leaders to Watch in GNSS, 2008, GPS World
- Fellow, Institute of Navigation, 2016
- CEDAR Distinguished Lecture Award, 2022

## Accomplishments

200+ peer-reviewed publications, Google Scholar h-index 47. Leading role in the design, implementation, application and development of the first real-time ionospheric monitoring system based on GPS (1991), PI of the Westford Water Vapor Experiment (1995), PI of the GNSS TEC and scintillation data products in the NSF CEDAR Madrigal database.

## Publications Most Closely Related to Project

Space Physics and Aeronomy, Volume 5, Space Weather Effects and Applications, **Anthea J. Coster** (Editor), Philip J. Erickson (Editor), Louis J. Lanzerotti (Editor), Yongliang Zhang (Editor-in-Chief), Larry J. Paxton (Editor-in-Chief) ISBN: 978-1-119-81558-7 April 2021.

**Coster, A. J.**, L. Goncharenko, S.-R. Zhang, P. J. Erickson, W. Rideout and J. Vierinen (2017), GNSS Observations of Ionospheric Variations During the 21 August 2017 Solar Eclipse, *Geophysical Research Letters*, accepted manuscript online: 20 NOV 2017, doi: 10.1002/2017GL075774.

**Coster, A. J.**, P. J. Erickson, J. C. Foster, E. G. Thomas, J. M. Ruohoniemi and J. Baker (2016), Solar Cycle 24 Observations of Storm-Enhanced Density and the Tongue of Ionization, *Ionospheric Space Weather*, (71-83).

**Coster, A.**, and A. Komjathy (2008), Space Weather and the Global Positioning System, *Space Weather*, 6, S06D04, doi:10.1029/2008SW000400.

**Coster, A. J.**, E. M. Gaposchkin, and L. E. Thornton, (1992). Real-Time Ionospheric Monitoring System Using GPS, *Navigation*, Vol. 39, No.2, Summer 1992.

## Other Significant Publications

Lambour, R. L., **A.J. Coster**, R. Clouser, L., E. Thornton, J. Sharma, T., A. Cott (2003), Operational impacts of space weather, *Geophysical Research Letters*, 30 (3), 1136, doi:10.1029/2002GL015168.

Kendall, E., R. Marshall, R. T. Parris, A. Bhatt, **A. Coster**, T. Pedersen, P. Bernhardt, and C. Selcher (2010) Decameter structure in heater-induced airglow at the High frequency Active Auroral Research Program facility, *Geophysical Research Letters*, 115, A08306, doi:10.1029/2009JA015043.

Mrak, S., Semeter, J., Nishimura, Y., Rodrigues, F.S., **Coster, A. J.**, and Groves, K., (2020) Leveraging geodetic GPS receivers for ionospheric scintillation science, in *Radio Science*, vol. 55, no. 11, pp. 1-17, doi: 10.1029/2020RS007131.

**Coster, A.J.**, L. Goncharenko, S.-R. Zhang, P. J. Erickson, W. Rideout, and J. Vierinen (2017), GNSS Observations of Ionospheric Variations During the 21 August 2017 Solar Eclipse, *Geophysical Research Letters*, 44, 12, doi:10.1002/2017GL075774.

**Coster, A.**, P.J. Erickson, J. Foster, E. Thomas, J. Ruohoniemi, J. Baker (2017), Solar Cycle 24 Observations of Storm Enhanced Density and the Tongue of Ionization, AGU Monograph, Ionospheric Space Weather, 2014-Oct-CH-0172, *Geophysical monograph series 220*, 71.

Zou, S., A. Ridley, X. Jia, E. Boyd, M. Nicolls, **A. Coster**, E. Thomas, and J. M. Ruohoniemi (2017), PFISR observation of intense ion upflow fluxes associated with an SED during the 1 June 2013 geomagnetic storm, *JGRA*, 122, 2589-2604, doi:10.1002/2016JA023697.

Semeter, J., M. Hirsch, F. Lind, **A. Coster**, P. Erickson, and V. Pankratius (2016), GNSS-ISR data fusion: General framework with application to the high-latitude ionosphere, *RaSc*, 51, 118-129, doi:10.1002/2015RS005794.