

Sebastijan Mrak

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Appointments

2020– Postdoctoral Research Associate, Center for Space Physics, Boston University
2016–2020 Research Assistant, Electrical and Computer Engineering, Boston University
2017–2018 Teaching Assistant, Electrical and Computer Engineering, Boston University
2016 Research Assistant, Radiation and Optics Laboratory, University of Ljubljana
2013–2016 Research Assistant, Communications Department, Josef Stefan Institute, Slovenia

Education

2016–2020 Ph.D., Electrical and Computer Engineering, Boston University
2013–2016 M.Sc., Electrical Engineering, University of Ljubljana
2009–2013 B.Sc., Electrical Engineering, University of Ljubljana

Publications

- **Mrak, S.**, Semeter, J., Nishimura, Y., Rodrigues, F. S., Coster, A. J., & Groves, K. (2020). Leveraging geodetic GPS receivers for ionospheric scintillation science. *Radio Science*, 55, e2020RS007131. <https://doi.org/10.1029/2020RS007131>.
- Yang, Z., **Mrak, S.**, Morton, Y., (2020). Geomagnetic Storm Induced Mid-latitude Ionospheric Plasma Irregularities and Their Implications for GPS Positioning over North America: A Case Study. *IEEE/ION Position, Location and Navigation Symposium (PLANS)*, 234-238. Doi:10.1109/PLANS46316.2020.9110132.
- Sivadas, N., Semeter, J., Nishimura, Y. T., & **Mrak, S.** (2019). Optical signatures of the outer radiation belt boundary. *Geophysical Research Letters*, 46, 8588–8596. Doi:10.1029/2019GL083908.
- Aryal, S., Geddes, G., Finn, S. C., **Mrak, S.**, Galkin, I., Cnossen, I., et al. (2019). Multispectral and multi-instrument observation of TIDs following the total solar eclipse of 21 August 21, 2017. *Journal of Geophysical Research: Space Physics*, 124, 3761– 3774. Doi: 10.1029/2018JA026333.
- **Mrak, S.**, Semeter, J. L., Nishimura, Y., Hirsch, & M., Sivadas, N. (2018). Coincidental TID Production by Tropospheric Weather during the August 2017 Total Solar Eclipse. *Geophysical Research Letters*, 45, 10,903-10,9011. Doi:10.1029/2018GL080239.
- **Mrak S.**, Semeter, J. L., Drob, D., and Huba, J. D. (2018). Direct EUV/X-ray modulation of the ionosphere during the August 2017 total solar eclipse. *Geophysical Research Letters*, 45, 3820–3828. doi:10.1029/2017GL076771.
- Hairston, M. R., **Mrak, S.**, Coley, W. R., Burrell, A., Holt, B., Perdue, M., et al. (2018). Topside ionospheric electron temperature observations of the 21 August 2017 eclipse by DMSF spacecraft. *Geophysical Research Letters*, 45, 7242–7247. doi:10.1029/2018GL077381
- **Mrak S**, Hrovat A, Vidmar M, Vilhar A. (2018), A Discrete-components Millimeter-Wave Satellite Beacon Receiver for Q-band Propagation Experiment. *Int J Satell Commun Network*. 36:372–382. doi:10.1002/sat.1240

- **Mrak S.**, et al., (2018), Field-aligned GPS Scintillation: Multi-Sensor Data Fusion, *J. Geophys. Res.*, 123, doi:10.1002/2017JA024557.
- Semeter, J., **Mrak, S.**, Hirsch, M., Swoboda, J., Akbari, H., Starr, G., *et al.* (2017). GPS signal corruption by the discrete Aurora: Precise measurements from the Mahali experiment. *Geophysical Research Letters*, 44, 9539-9546. <https://doi.org/10.1002/2017GL073570>
- **Mrak S.**, Vilhar A., Kuhar U. (2015), Low-Cost System Design for Tracking Satellites in Geosynchronous Orbit, *European Conference on Antennas and Propagation*, Lisbon, Portugal.

Professional Activities

- Team member, International Space Science Institute 2021, Multi-Scale Magnetosphere-Ionosphere-Thermosphere Interaction. Led by Toshi Nishimura.
- Team member, NASA Living With a Star Institute 2019: Space weather effects on GNSS at mid-latitudes. Led by Keith Groves.
- External grant reviewer for Czech Science Foundation: 2020
- Reviewer, Geophysical Research Letters: 2018, 2019, 2020
- Reviewer, Radio Science: 2018, 2019
- Reviewer, Advances in Space Research: 2018, 2019, 2020, 2021
- Reviewer, Journal of Geophysical Research Space Physics: 2019, 2020, 2021
- Reviewer, Journal of Space Weather and Space Climate: 2020
- Reviewer, NAVIGATION: 2020

Professional Memberships

- Member of Institute of Electrical and Electronics Engineers (IEEE) since 2014.
- Member of American Geophysical Union (AGU) since 2017.
- Member of Institute of Navigation (ION) since 2019.
- Senior Member of International Union of Radio Science (URSI) since 2019.

Outreach and talks

- Invited talk at URSI AT-RASC 2018: "New frontiers in Auroral Plasma Dynamics inferred from dense GNSS receiver array Observations"
- Invited talk at AGU 2018: "Direct EUV/X-ray Modulation of the Ionosphere and accompanying TIDs during the August 2017 Total Solar Eclipse"
- Sponsor of Award winning Senior Design Project at BU ECE 2018: "Ubru: Fully automatic coffee machine"
- Field deployment of GNSS receivers to Missouri for 21 August 2017 eclipse:
 - News Tribune: "Scientists asking for space in local yards to improve space weather forecasting."
 - Springfield News Leader: "Eclipse 'waves' in atmosphere? Scientists seek local volunteers to help spot them"
 - KY3 News Live Interview: "Boston University researchers use GPS sensors during solar eclipse"