

# Kristoff Paulson

🏠 30 Hancock St. #1, Salem, MA, 01970  
☎ +1 202-441-5185  
✉ kristoffpaulson@gmail.com  
🌐 <http://www.kristoffpaulson.com>

## EDUCATION

---

July 2015 *Heliophysics Summer School*, Boulder, CO  
July 2014 *ISR Summer School*, Arecibo, PR

2011 – PRESENT **PhD Candidate**  
PHYSICS  
*University of New Hampshire*

2009 – 2010 **Non-degree Graduate Studies**  
PHYSICS  
*Tulane University*

2002 – 2006 **Bachelor of Arts**  
Distinction  
PHYSICS, RELIGIOUS STUDIES  
*Colby College*

## AWARDS

---

2016 **UNH NASA Space Grant Fellowship**  
*NASA*

2015 **NRSM Travel Fellowship Award**  
*USNC-URSI and NSF*

2015 **IUGG Travel Award**  
*IUGG General Assembly*

2014 **Ming/Chen Scholarship**  
*Physics Department - University of New Hampshire*

2014, 2015, 2018 **UNH Travel Grant**  
*University of New Hampshire*

## COMPUTER SKILLS

---

Proficiency JYTHON (Autoplot), PYTHON, L<sup>A</sup>T<sub>E</sub>X, SolidWorks, ProEngineer, Computer Hardware & Support

Working Knowledge FORTRAN, JAVA, HTML, IDL, MATLAB

## WORK EXPERIENCE

---

### Research Assistant

CURRENT, FROM MAY 2012

*University of New Hampshire*

- Derived and analyzed solar wind shock parameters and orientation using fortran codes solving Rankine-Hugoniot conditions, and reconstructed CME and FTE flux ropes via Grad-Shafranov methods.
- Oversaw the design, construction, and testing of a prototype fluxgate magnetometer which flew successfully on the RENU2 sounding rocket mission.
- Compiled a full list of categorized EMIC wave events observed by both the Van Allen Probes and MMS missions, and calculated a variety of wave parameters including those related to polarization and Poynting flux. Identified fundamental differences between unstructured EMIC waves and Pc1 pearl pulsations implying separate generation mechanism.
- Played mentorship role for several students spending their Summer engaging in space science research as part of the Project SMART program.

### Teaching Assistant

AUG 2011 TO MAY 2012

*University of New Hampshire*

Oversaw the instruction of the laboratory portion of a traditional introduction to physics (waves, electricity and magnetism) class, and served in an instructional capacity for a studio-based introduction to physics (mechanics) class.

### Assistant Manager

MAR 2009 TO AUG 2011

*Reginellis*

Worked all restaurant positions, both back and front of house. As an Assistant Manager, was responsible for oversight of 12 employees in day-to-day operations as well as hiring practices. Was responsible for inventory management, daily orders and financial bookkeeping.

### Mechanical Engineer

JUN 2007 TO AUG 2008

*ATK Space Services*

Designed subassemblies for and assembled the STIS Fastener Capture Plate, a tool flown on STS 125 to repair the STIS instrument on the Hubble Space Telescope during Servicing Mission 4. Oversaw a small team of machinists and engineers during product assembly and fabrication of test structures.

## PUBLICATIONS

---

### *Articles in Refereed Journals*

- Ahmadi, N., F. D. Wilder, R. E. Ergun, M. R. Argall, M. E. Usanova, H. Breuillard, D. Malaspina, **K. W. Paulson**, et al., (2018), Generation of Electron Whistler Waves at the Mirror Mode Magnetic Holes: MMS Observations and PIC Simulation, *JGR: Space Physics*, doi: 10.1029/2018JA025452
- Kacem, I., C. Jacquy, V. Génot, B. Lavraud, Y. Vernisse, A. Marchaudon, O. Le Contel, H. Breuillard, T. D. Phan, et al., (2018), Magnetic Reconnection at a Thin Current Sheet Separating Two Interlaced Flux Tubes at the Earth's Magnetopause, *JGR: Space Physics*, 123, 1779–1793, doi: 10.1002/2017JA024537
- Farrugia, C. J., I. J. Cohen, B. J. Vasquez, N. Lugaz, L. Alm, R. B. Torbert, M. R. Argall, **K. W. Paulson**, et al., (2018), Effects in the near-Magnetopause Magnetosheath Elicited by Large-Amplitude Alfvénic Fluctuations Terminating in a Field and Flow Discontinuity, *JGR: Space Physics*, doi: 10.1029/2018JA025724
- Argall, M. R., **K. W. Paulson**, L. Alm, A. Rager, J. Dorelli, J. Shuster, S. Wang, R. B. Torbert, et al. (2018), Electron dynamics within the electron diffusion region of asymmetric reconnection, *JGR: Space Physics*, 123, 146–162, doi: 10.1002/2017JA024524
- Alm, L., C. J. Farrugia, **K. W. Paulson**, M. R. Argall, R. B. Torbert, J. L. Burch, R. E. Ergun, et al., (2018), Differing Properties of Two Ion-Scale Magnetopause Flux Ropes, *JGR: Space Physics*, 123, 114–131, doi: 10.1002/2017JA024525

- Farrugia, C. J., N. Lugaz, L. Alm, B. Vasquez, M. R. Argall, H. Kucharek, H. Matsui, R. B. Torbert, et al., (2017), MMS Observations of Reconnection at Dayside Magnetopause Crossings During Transitions of the Solar Wind to Sub-Alfvénic Flow, *JGR: Space Physics*, 122, 9934–9951, doi: 10.1002/2017JA024563
- Blum, L. W., J. W. Bonnell, O. V. Agapitov, **K. W. Paulson**, C. A. Kletzing, (2017), EMIC wave scale size in the inner magnetosphere: Observations from the dual Van Allen Probes *Geophys. Res. Lett.*, 44, 1227–1233, doi:10.1002/2016GL072316
- **Paulson, K. W.**, C. W. Smith, M. R. Lessard, R. B. Torbert, C. A. Kletzing, and J. R. Wygant, (2017), In situ statistical observations of Pc1 pearl pulsations and unstructured EMIC waves by the Van Allen Probes, *JGR: Space Physics*, 122, 105–119, doi:10.1002/2016JA023160
- Matsui, H., P. J. Erickson, J. C. Foster, R. B. Torbert, et al., (2016), Dipolarization in the inner magnetosphere during a geomagnetic storm on 7 October 2015 *Geophys. Res. Lett.*, 43, 9397–9405 doi:10.1002/2016GL070677
- Erickson, P. J., H. Matsui, J. C. Foster, R. B. Torbert, R. E. Ergun, Y. V. Khotyaintsev, P-A. Lindqvist, M. R. Argall, C. J. Farrugia, **K. W. Paulson**, R. J. Strangeway, W. Magnes, (2016), Multipoint MMS observations of fine-scale SAPS structure in the inner magnetosphere *Geophys. Res. Lett.*, 43, 7294–7300, doi:10.1002/2016GL069174
- Farrugia, C. J., B. Lavraud, R. B. Torbert, M. J. Argall, et al., (2016), Magnetospheric Multiscale Mission observations and non-force free modeling of a flux transfer event immersed in a super-Alfvénic flow *Geophys. Res. Lett.*, 43, 6070–6077, doi:10.1002/2016GL068758
- Matsui, H., **K. W. Paulson**, R. B. Torbert, H. E. Spence, W. S. Kurth, R. M. Skoug, C. A. Kletzing, and B. A. Larsen, (2016), Nonlinearity in chorus waves during a geomagnetic storm on 1 November 2012, *JGR: Space Physics*, 121, 358–373 doi: 10.1002/2015JA021772
- Lugaz, N., C. J. Farrugia, C. W. Smith, **K. W. Paulson**, (2014) Shocks inside CMEs: A Survey of Properties from 1997 to 2006, *JGR: Space Physics*, 120, 4, 2409–2427, doi: 10.1002/2014JA020848
- **Paulson, K. W.**, C. W. Smith, M. R. Lessard, M. J. Engebretson, R. B. Torbert, and C. A. Kletzing (2014), In situ observations of Pc1 pearl pulsations by the Van Allen Probes, *Geophys. Res. Lett.*, 41, 1823–1829, doi: 10.1002/2013GL059187
- **Paulson, K. W.**, D. K. Taylor, C. W. Smith, B. J. Vasquez, and Q. Hu (2012), Advance warning of high-speed ejecta based on real-time shock analyses: When fast-moving ejecta appear to be overtaking slow-moving shocks, *Space Weather*, 10, S12002, doi:10.1029/2012SW000855

## PRESENTATIONS

---

### *Oral Presentations*

- Direct In Situ Observations of Whistler-Mode Chorus Modulation of 500eV EDI Electrons by MMS  
*URSI NRSM*  
Boulder, CO, 2018
- Interactions between EMIC and Magnetosonic Wave Modes at Heavy Ion Boundaries  
*AGU Fall Meeting*  
New Orleans, LA, 2017
- Magnetospheric Waves  
*GEM Workshop Student Day*  
Portsmouth, VA, 2017
- Direct Observations of ULF and Whistler-Mode Chorus Modulation of 500eV EDI Electrons by MMS  
*AGU Fall Meeting*

San Francisco, CA, 2016

- In Situ Statistical Observations of Pc1 Pearl Pulsations by the Van Allen Probes  
*URSI NRSM* - Invited  
Boulder, CO, 2016
- In Situ Statistical Observations of Pc1 Pearl Pulsations and Unstructured EMIC Waves Using the Van Allen Probes  
*IUGG General Assembly* - Invited  
Prague, Czech Republic, 2015
- Observations of EMIC Wave Growth by MMS  
*AGU Fall Meeting*  
San Francisco, CA, 2015
- Solar cycle dependence of ion cyclotron wave frequencies  
*AGU Chapman Conference on Low-Frequency Waves in Space Plasmas*  
Jeju, Korea, 2014

### *Poster Presentations*

- Occurrences and wave properties of Pc1 pearl pulsations relative to plasma boundaries  
*GEM Workshop*  
Portsmouth, VA 2017
- Observations of wave mode conversion from magnetosonic to ion cyclotron in Earth's magnetosphere  
*GEM Workshop*  
Santa Fe, NM 2016
- EMIC waves observed by MMS and the Van Allen Probes  
*AGU Chapman Conference*  
Fairbanks, AK 2015
- Statistical Observations of Pc1 Pearl Pulsations as Compared to Unstructured EMIC Waves Using the Van Allen Probes  
*AGU Fall Meeting*  
San Francisco, CA 2014
- Statistical Distribution of Observations of Pc1 Pearl Pulsations by the Van Allen Probes and Poynting Flux Analysis from 11th October 2013  
*AGU Chapman Conference on Low-Frequency Waves in Space Plasmas*  
Jeju, Korea, 2014
- Statistical Observations of Pc1 Pearl Pulsations using the Van Allen Probes  
*GEM Summer Workshop*  
Portsmouth, VA 2014
- In-Situ and Ground-based Observations of Pc1 Pearl Pulsations  
*AGU Fall Meeting*  
San Francisco, CA 2013