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Education

Ph.D. Physics, 2016, Dartmouth College

M.S. Physics, 2010, Dartmouth College

B.A. Physics, 2007, Franklin & Marshall College

A.A. Social Science (History), 2003, Harrisburg Area Community College

Skills

- Languages: English (native), German (basic)
- Communications:
  - Experienced in creative, technical, and scientific writing
    ...and strategic combinations thereof
  - Proofreading, typesetting, and editing
  - Creation of infographics and promotional materials
  - Facilitation of negotiations between conflicting organizations
- Administration and Leadership:
  - Accounting and funding of small groups and activities
  - Administration of small groups and coordination between groups
  - One-on-one and group training and teaching
- Computer & Technical Skills
  - Fluent in Python, Mathematica, Matlab, TI DSP Assembly, RegEx, BASH script
  - Competent with Julia, R, LaTeX, C, C++, Fortran, HTML, CSS, PHP, SQL
  - Selecting, building, troubleshooting PC & Mac Hardware
  - Experienced with dev environment construction, build engineering, library/framework conflict resolution
  - Basic knowledge of Tensorflow, Keras, PyTorch
  - User Interface/User Experience QA Testing
  - Linux system installation, administration, server administration, driver debugging
  - Mac OS X system installation, administration, server administration, development
  - Windows system installation, administration
  - Some experience with AWS, DigitalOcean, and Scaleway, Chef, PBS/Torque, SWIG, Elixir, Labview, PERL, IDL, Javascript, Clojure, jQuery, Knockout.js, Java, CDF, HDF5
- High-speed, multichannel data acquisition system development
- Basic circuit board/wiring diagram analysis, testing, & debugging
- Storage, processing, and reduction of large data sets
- Numerical simulation development and cluster deployment

References

Jim LaBelle Physics Professor, Dartmouth College
jlabelle@aristotle.dartmouth.edu 1.603.646.2973 (office)

Collaborations: Sounding rocket instrumentation and data analysis, high-speed data acquisition system development, digital signal processing radio receiver development, numerical plasma simulations.

Doug Rowland Space Scientist, NASA GSFC
douglas.e.rowland@nasa.gov 1.301.286.6659 (office)

Collaborations: Analysis of three-dimensional HF wave data, theoretical considerations of Langmuir wave detection and propagation.

Ken Krebs Physics Professor, Franklin & Marshall College
ken.krebs@fandm.edu 1.717.291.4283 (office)

Collaborations: Synthesis of sol-gel alumina thin-films, laser CNC system development for controlled film densification, spectral analysis of results.

Research Positions

Graduate Research Assistant Summer 2008-Spring 2016

Dr. Jim LaBelle Dartmouth College

Sounding rocket research in the auroral ionosphere centered on the NASA TRICE, ACES, and CHARM II missions. Rocket science instrument testing and calibration, data acquisition, data analysis, and development of theories of plasma wave generation and propagation. Support for ground-based operations involving various remote radio receiver stations, including analog-to-digital PC data acquisition system development and DSP-based software radio receiver development. Numerical simulation of theories.

Undergraduate Research Assistant Summer 2006-Spring 2007

Dr. John K. Krebs Franklin & Marshall College

Design and implementation of—and research using—a system for laser-densifying alumina (Al2O3) and other materials created through a Sol-Gel process, towards an eventual goal of creating channel waveguides in thin alumina films.

Undergraduate Research Assistant Summer-Fall 2005

Dr. Elizabeth Praton Franklin & Marshall College

Analysis of universe-simulation data with Fortran programs towards disproving a simple path-length-ratio method of quantifying the Bulls-Eye distortion effect in redshift-space maps. Research into new methods of quantification, including a simulated annealing approach to path drawing.

Teaching Experience

Graduate Student Teaching Assistant (Lab TA), Dartmouth College, 2007-2015

Undergraduate Physics Tutor, Franklin & Marshall College, 2006-2007

Undergraduate Mathematics Tutor, Harrisburg Area Community College, 2002-2003

Publications & Presentations

1. Dombrowski, M. P., J. LaBelle, C. A. Kletzing, S. R. Bounds, I. H. Cairns, and S. R. Kaeppler, Statistical Study of Electron Bunching in Auroral Langmuir Waves, J. Geophys. Res. Space Physics. doi:10.1029/2018JA026262.
2. Dombrowski, M. P. "Sounding-Rocket Studies of Langmuir Wave Microphysics in the Auroral Ionosphere". Dartmouth College PhD Thesis, accepted May 2016. http://www.luriam.net/ wibble/thesis.html.
3. Dombrowski, M. P., J. LaBelle, D. G. McGaw, and M. C. Broughton (2016), An autonomous receiver/digital signal processor applied to ground-based and rocket-borne wave experiments, J. Geophys. Res. Space Physics, 121, 7334-7343, doi:10.1002/2016JA022441.
4. Dombrowski, M. P., J. LaBelle, D. G. McGaw, M. C. Broughton, J. C. Vandiver, S. Hatch, An Autonomous Receiver/Digital Signal Processor Applied to Ground-Based and Rocket-Borne Wave Experiments, Abstract 22.b.12 presented at 2015 MTSSP Conference, Boulder, Colorado, 20-24 Apr.
5. Dombrowski, M. P., J. LaBelle, C. Kletzing, S. R. Bounds, and S. R. Kaeppler (2014), A Statistical Analysis of Langmuir Wave-Electron Correlations Observed by the CHARM II Auroral Sounding Rocket, Abstract SM31C-4213 presented at 2014 Fall Meeting, AGU, San Francisco, Calif., 15-19 Dec.
6. Dombrowski, M. P., J. LaBelle, C. Kletzing, S. R. Bounds, and S. R. Kaeppler (2013), Statistical Analysis of Bursty Langmuir Waves, Alfvén and Whistler Waves, and Precipitating Electrons Seen by the CHARM II Nightside Sounding Rocket, Abstract SM23A-2213 presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.
7. Dombrowski, M. P., J. LaBelle, D. E. Rowland, R. F. Pfaff, C. Kletzing (2012), Statistical Analysis of Bursty Langmuir Waves and Coincident VLF Waves in the Cusp, Abstract SM31B-2288 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.
8. Dombrowski, M. P., J. LaBelle, D. E. Rowland, R. F. Pfaff, and C. A. Kletzing (2012), Interpretation of vector electric field measurements of bursty Langmuir waves in the cusp, J. Geophys. Res., 117, A09209, doi:10.1029/2012JA017741.
9. Departmental Engineering-Plasma Physics Seminar, "Interpreting High-Frequency Vector Electric Field Measurements in the Cusp: Bursty Langmuir Waves on the TRICE Sounding Rocket Mission", Dartmouth College, 14 Feb 2012.
10. Dombrowski, M. P., J. LaBelle, D. E. Rowland, R. F. Pfaff, and C. Kletzing (2011), Interpretation of Vector Electric Field Measurements of Bursty Langmuir Waves in the Cusp, Abstract SM13B-2060 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.

11. Dombrowski, M. P., J. LaBelle, D. E. Rowland, R. F. Pfaff, and C. Kletzing (2011), Langmuir Wave Measurements in the Cusp, from Multiple Rocket-Borne Instruments, poster presented at 2011 Geospace Environment Modeling Workshop, Santa Fe, NM, 26 Jun-1 Jul.
12. Dombrowski, M. P., J. LaBelle, C. Kletzing, S. Bounds, S. Kaeppler (2010), Modeling of 'Stripe' Wave Phenomena Seen by the CHARM II and ACES Sounding Rockets, Abstract SM51B-1811 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
13. Dombrowski, M. P., J. LaBelle, C. Kletzing, S. Kaeppler (2010), CHARM 2 Auroral Sounding Rocket: Preliminary Results, poster presented at 2010 Geospace Environment Modeling Workshop, Snowmass, CO, 20-25 Jun.
14. Dombrowski, M. P. and J. K. Krebs, "Laser Writing of Channel Waveguides into Sol-Gel Alumina Films". 2007 Honors Thesis, Franklin & Marshall College.

Grants/Fellowships

NASA Graduate Student Research Program (GSRP) Fellowship, NASA Goddard Space Flight Center, 2010-2012

Hackman Summer Research Fellowship, Franklin & Marshall College, with J. K. Krebs, 2006

Hackman Summer Research Fellowship, Franklin & Marshall College, with E. Praton, 2005

Awards and Honors

Phi Beta Kappa, 2007 - Academic Honor Society

John Kershner Scholar in Mathematics, Franklin & Marshall College, 2007

Frank Durrell Enck Memorial Prize in Physics, Franklin & Marshall College, 2007

John Kershner Scholar in Physics and Astronomy, Franklin & Marshall College, 2006

Sigma Pi Sigma - Physics Honor Society

Pi Mu Epsilon - Mathematics Honor Society

Phi Theta Kappa - International Honor Society of the Two Year College