Jeremy M. Hanson, Ph. D.

San Diego, CA
jmh2130@columbia.edu
http://www.columbia.edu/~jmh2130/

Professional summary

- Contributed to fusion plasma physics understanding through communication and teamwork.
- Presented research results at international conferences.
- Authored peer-reviewed journal articles.
- Led technical working groups.
- Led collaborative design and execution of scientific experiments.

Technical skills

- Data analysis and visualization using IDL, Matlab, and Python.
- Reconciling measurements and models using regression.
- Signal processing with FFTs, recursive filters, linear observers.
- Classical and modern control using PID and LQG techniques.
- Real-time control algorithm design; C-language and LabVIEW FPGA implementation.

Experience

Department of Applied Physics & Applied Mathematics - Columbia University
Associate Research Scientist, DIII-D National Fusion Facility, May 2011 – present.

- Published research results in peer-reviewed journal articles.
- Made oral presentations at national and international conferences.
- Led collaborative design and execution of scientific experiments.
- Mentored undergraduate, graduate, and postdoctoral researchers.
- Coauthored successful research grant applications.
- Gained proficiency with plasma equilibrium, transport, and stability simulation codes.
- DIII-D run schedule coordination team, Jan 2019 – present.
- DIII-D physics operator, Apr 2014 – present.
- Deputy Leader, "3D & Stability Physics" topical area, Jan 2015 – present.
- Deputy Leader, "Stability and Disruption Avoidance" topical area, Dec 2012 – Dec 2014.
- DIII-D Research Council member, Jan 2012 – Jul 2013.

Postdoctoral Fellow, DIII-D National Fusion Facility, May 2009 – May 2011.

- Designed and implemented real-time control algorithms in DIII-D plasma control system.
- Simulated eigenvalue and time-domain stability and control problems.
- Jointly affiliated with Oak Ridge Institute for Science and Education.

Research Assistant, High Beta Tokamak–Extended Pulse experiment, Jun 2005 – May 2009.

- Designed and implemented real-time Kalman filter algorithm for control of plasma instabilities.
- Maintained experimental systems: CAMAC and D-TACQ digitizers, magnet cooling system, power supplies, capacitor banks.
- Administered Linux and VMS data acquisition and analysis servers.

Teaching Assistant, Computational Mathematics and Physics, Jan 2005 – May 2005.
Teaching Assistant, Applied Linear Algebra, Sep 2004 – Dec 2004.

- Assisted students in understanding course material.
- Proctored written examinations.
- Generated solution sets for weekly assignments.
- Corrected assignments and exams; tabulated grades.

UW-Madison Plasma Physics Group
Lab Assistant, Jan 2001 – Aug 2004.

Education

Ph. D. Applied Physics, May 2009.
Columbia University (New York, NY)

M. S. Applied Physics, May 2005.
Columbia University (New York, NY)

B. S. Applied Mathematics, Engineering, and Physics, May 2004.
University of Wisconsin-Madison (Madison, WI)

Computer skills

Bash, C, Git, HTML/CSS, IDL, LaTeX, Matlab, Microsoft Office, LabVIEW, Linux, Python, VMS.

Professional development

Certificate, Leadership and Management Program, May 2015.
University of California, San Diego Extension (San Diego, CA)

Professional activities

Expert group member, Transients Expert Group, APS Division of Plasma Physics Community Planning Process, 2019.

Guest editor, *Plasma Physics and Controlled Fusion* **60**, special issue for 22nd Workshop on MHD Stability Control, 2018.

Breakout group co-leader, US Magnetic Fusion Research Strategic Directions Workshop 2, Austin, TX, 2017.

Program chair, 22nd Workshop on MHD Stability Control, Madison, WI, 2017.

Panel member, DOE Fusion Energy Sciences workshop on Transients in Tokamak Plasmas, 2015.

Member, American Physical Society, 2005 – present.

Honors

Robert Simon Memorial Prize, May 2010.
Awarded annually by the Department of Applied Physics and Applied Mathematics to the graduate student who has completed the most outstanding dissertation.
(APAM Department, Columbia University)

U.S. Department of Energy Fusion Energy Sciences Postdoctoral Research Program appointment, May 2009.
The Fusion Energy Postdoctoral Research Program offers recent doctoral degree recipients the opportunity to conduct research in the U.S. Department of Energy's fusion energy research and development programs.
(Office of Fusion Energy Sciences, U.S. Department of Energy)

Extraordinary Teaching Assistant Award, December 2005.
Awarded for exceptional effort as a teaching assistant and excellence in undergraduate education.
(School of Engineering and Applied Science, Columbia University)

AMEP Leadership Prize, May 2004.
Awarded yearly to outstanding students pursuing a degree in Applied Mathematics, Engineering, and Physics (AMEP). (University of Wisconsin–Madison)