JULIE C. VANDERHOFF

Brigham Young University, Department of Mechanical Engineering
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EDUCATION

Ph.D., Engineering Sciences (Mechanical Engineering)
University of California, San Diego (2007)

M.S., Engineering Sciences (Mechanical Engineering)
University of California, San Diego (2004)

B.S., Mechanical Engineering *University of Denver* (2002)

TEACHING EXPERIENCE

Assistant Professor, *Brigham Young University*, Dept of Mechanical Engineering (Oct 2007-present)

Teaching Assistant, *University of California, San Diego,* Dept of Mechanical and Aerospace Engineering (2004-2007)

- Served as T.A. for upper-division undergraduate courses: Thermodynamics (2 quarters), Fluid Mechanics, I (5 quarters), Fluid Mechanics, II (4 quarters)
- Received excellent student evaluations each quarter
- Improved student understanding of coursework by preparing and presenting discussion sections, holding office hours, answering emails and preparing and presenting review sessions.
- Served as head TA for 250 student class with 4 TA's and 5 graders, organizing TA and grader workload.
- Prepare homework solution sets.

Teaching Consultant, *Individual Adjunct Professors* (see references, Dr. Rohr) (2005-present)

- Review professor lectures for accurate content and appropriate length.
- Create homework assignments and solutions.
- Create quizzes, tests, and solutions testing students' knowledge over homework and lecture material.

TEACHING INTERESTS

Thermodynamics	Heat Transfer	Fluid Mechanics
Environmental Engineering	Numerical Methods	Computational Fluid Dynamics

RESEARCH EXPERIENCE

Graduate Research, *Dept of Mechanical and Aerospace Engineering, UCSD* (2002-2007)

- *Advisor: Professor James W. Rottman.* Oceanic and atmospheric internal wave propagation through time independent and time dependent shears leading to changes in internal wave energy distribution and possible energy dissipation.

- *Accomplishments:* In depth analysis of dynamics at location of wave interactions, including amplitude, frequency, and energy changes; statistical analysis of many realistic wave-wave interactions; three-dimensional ray tracing of wave-wave interactions

- *Selected computational skills:* ray tracing using ray theory, computational fluid dynamics through numerical modeling with spectral and finite differencing codes.

Research Intern, *SPAWAR* (summer 2005 and 2006)
- *Principal Investigator: Dr. James Rohr.* Modeling and analysis of bioluminescent organisms flashing in pipe flow using Matlab.
- *Selected computational skills:* microfluidics flow in a pipe.

Graduate Fieldwork, *Scripps Institute of Oceanography* (2002, 2006)
- *Advisor: Professor Rob Pinkel.* Two trips to Pacific Ocean (total of 7 weeks) to collect data on internal wave propagation. A part of the Hawaiian Ocean Mixing Experiment.
- *Selected technical skills:* housing and deployment systems for current-temperature-density probes.

Undergraduate Research, *University of Denver* (2001-2002)
- *Advisor: Professor Corinne Lengsfeld.* Importance of electric potential gradient and charge density in droplet breakdown.
- *Selected technical skills:* atomization spray techniques.

UNIVERSITY SERVICE AND OUTREACH

- NSF Panel Reviewer, March 2008
- Fluids and Thermodynamics graduate exam committee (2008)
- APS DFD Annual Meeting Session Chair, November 2007
- Department Undergraduate research proposal reviewer (2007)
- University sponsored faculty development series, including seminars and projects aimed to enhance new faculty progress (October 2007 – present)
- Present engineering projects to local middle and high schools, recently Gompers Middle School (a UCSD partnership charter school) Community Outreach Science Night (2007)
- Graduate Student Panelist for prospective graduate students (2004)
- Featured on UCSD Jacobs School of Engineering website discussing research to entice prospective graduate students (2002)

AWARDS AND FELLOWSHIPS

2006-2007 *Outstanding Teaching Assistant*, Dept of Mechanical and Aerospace Engineering, UCSD
2005, 2006 *Travel Award*, Dept of Mechanical and Aerospace Engineering, UCSD
2002-2003 *Freshman Fellowship*, Dept of Mechanical and Aerospace Engineering, UCSD

PUBLICATIONS, CONFERENCE AND SCHOLARLY PRESENTATIONS

Vanderhoff, J. C., K. K. Nomura, J. W. Rottman, and C. Macaskill (2008), *Doppler spreading of internal gravity waves by an inertia-wave packet*, J. Geophys. Res., 113, C05018, doi:10.1029/2007JC004390.

Vanderhoff, J. *A numerical and observational investigation of short and long internal wave interactions.* Department of Mechanical and Aerospace Engineering, Doctoral Dissertation, University of California, San Diego, 2007.

Vanderhoff, J., *Propagation of topographically generated internal waves in the atmosphere.* 13th Conference on Mountain Meteorology, Whistler, B.C., Canada. August, 2008.

Vanderhoff, J., Rottman, J., Nomura, K., and Broutman, D. *Internal wave frequency spectrum dependence on inertial wave interactions.* To be submitted.

Vanderhoff, J. C. *Internal Wave Dynamics in the Atmosphere*, University of Utah, Department of Meteorology. November 10, 2008. Invited Mountain Meteorology Practicum talk.

Vanderhoff, J., *Small-scale internal wave propagation through time-dependent shear in the Ocean.* Pattullo Conference, Charleston, South Carolina. May, 2008. Conference talk.

Vanderhoff, J., Rottman, J., Nomura, K. *Numerical and observational investigation of small-scale wave interactions with time-dependent shears in the ocean.* American Physical Society Division of Fluid Dynamics Annual Meeting, Salt Lake City, Utah. November, 2007. Conference talk.

Vanderhoff, J., Rottman, J., Nomura, K. *Scattering of small-scale internal waves by near-inertial wavepackets in the ocean.* American Physical Society Division of Fluid Dynamics Annual Meeting, Tampa Bay, Florida. November, 2006. Conference talk.

Vanderhoff, J., Rottman, J., Nomura, K. *Evolution of a small-scale internal wave-packet through a time varying shear.* UCSD Research Expo, February, 2006. Poster Session.

Vanderhoff, J., Rottman, J., Nomura, K. *Doppler spreading of internal gravity waves in the ocean.* American Physical Society Division of Fluid Dynamics Annual Meeting, Chicago, Illinois. November, 2005. Conference talk.

Vanderhoff, J., Rottman, J., Nomura, K. *Doppler spreading of internal gravity waves by an inertia-wave packet.* UCSD Research Expo, February, 2005. Poster Session.

Nomura, K.K., Tsutsui, H., Mahoney, D., Crockett, J., Rottman, J.W. *Evolution of a counter-rotating vortex Pair in a stably stratified fluid.* Third International Symposium on Turbulence and Shear Flow Phenomena, Sendai, Japan. 2003.

Nomura, K., Mahoney, D., Tsutsui, H., Crockett, J., Rottman, J. *Effects of stable stratification on the short wave instability in a vortex pair.* APS Meeting of the Division of Fluid Dynamics, Dallas, Texas. 2002.

REFERENCES

Professor James W. Rottman
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La Jolla, CA 92093-0411
E-mail: jrottman@ucsd.edu
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