

## TETJANA ROSS

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### RESEARCH INTERESTS

Acoustic scattering from oceanic zooplankton, turbulence, double diffusive interfaces and biological/physical thin layers; small-scale bio-physical interactions; importance of double-diffusion in Polar Regions; distinguishing acoustic scatter from biotic and physical sources; turbulence theory.

### EDUCATION

**PhD., *Ocean Physics***, University of Victoria, *Sound scattering from oceanic turbulence*, 2003  
**B.Sc., *Physics (First Class Honours)***, University of Manitoba, 1998

### ACADEMIC AND RESEARCH POSITIONS

2005-present **Assistant Professor and NSERC UFA** (Oceanography, Dalhousie University)  
2003-2005 **Postdoctoral Scholar** (Woods Hole Oceanographic Institution)  
2000-2003 **Doctoral Candidate** (University of Victoria)  
1998-2000 **Masters Candidate** (University of Victoria)  
1997 **University of Manitoba Summer Student**, Computer modeling of a Condensed Matter System (University of Manitoba)  
1996 **Research Assistant**, Influence of Hydrogen on the Magnetoresistance of Nb/Fe Multilayers (Hahn-Meitner-Institut, Berlin, Germany)  
1994&1995 **NSERC Summer Student**, Parity Violation in Proton-Proton Scattering (TRIUMF, University of British Columbia)

### AWARDS AND DISTINCTIONS

- Will be promoted to **Associate Professor with tenure** on July 1, 2011
- **NSERC University Faculty Award** at Dalhousie University (2005-present)
- Awarded **full support to attend the IMPETUS 2008: Techniques in Polar Ocean Observation and Monitoring workshop** in St. Petersburg, Russia (2008)
- Invited to act as an **advisor for the \$309 million (US) Ocean Research Interactive Observatory Networks (ORION) program** as part of the Sensors committee (2006)
- Invited to participate in the **Dissertation Initiative for the Advancement of Limnology and Oceanography (DIALOG) VI Symposium** (2004)
- **Acoustical Society of America Young Investigator Travel Grant** (2004)
- **Woods Hole Oceanographic Institution Postdoctoral Fellowship** (2003-05)

- Invited to participate in the **Physical Oceanography Dissertation II Symposium** (2003)
- **AGU Outstanding Student Paper Award** (for poster at 2002 Ocean Sciences Meeting)
- **University of Victoria Howard E. Petch Research Scholarship** (2001-02)
- **Canadian Meteorological and Oceanographic Soc. Postgraduate Scholarship** (2000-02)
- **Department of Fisheries and Oceans Postgraduate Scholarship** (2000)
- **NSERC Postgraduate Scholarships (PGS A & B)** (1998-02)
- **University of Victoria President's Research Scholarship** (1998-02)
- **Maritime Awards Society of Canada Graduate Fellowship** (1998)
- **Undergraduate awards** (1994-98) including: Samuel M. Neamtan Memorial, University of Manitoba Student Union, University of Manitoba Undergraduate Research, Women in the Physical Sciences, Isbister, and NSERC Targeted Undergraduate Research Scholarships

**REFEREED PUBLICATIONS** (underlined names are students I have advised)

**Tetjana Ross** and Andone Lavery, “Acoustic detection of oceanic double-diffusive convection: A feasibility study”, *27*:580–593, *Journal of Oceanic and Atmospheric Technology*.

Jessica Sameoto, **Tetjana Ross**, and Anna Metaxas, “The effect of flow on larval vertical distribution of the sea urchin, *Strongylocentrotus droebachiensis*”, *Journal of Experimental Marine Biology and Ecology*, **383**:156–163, 2010.

**Tetjana Ross** and Andone Lavery, “Laboratory observations of double-diffusive convection using high-frequency broadband acoustics”, *Experiments in Fluids*, **46**:355–364, 2009.

Andone Lavery and **Tetjana Ross**, “Acoustic scattering from double-diffusive microstructure”, *Journal of the Acoustical Society of America*, **122**:1449-1462. 2007.

**Tetjana Ross**, Isabelle Gaboury and Rolf Lueck, “Simultaneous acoustic observations of turbulence and zooplankton in the ocean”, *Deep Sea Research I*, **54**:143-153, 2007.

**Tetjana Ross** and Rolf Lueck, “Estimating turbulent dissipation rates from acoustic backscatter”, *Deep Sea Research I*, **52**:2353–2365, 2005.

**Tetjana Ross**, Chris Garrett and Rolf Lueck, “On the turbulent co-spectrum of two scalars and its effect on acoustic scattering from oceanic turbulence”, *Journal of Fluid Mechanics*, **514**:107-119, 2004.

**Tetjana Ross** and Rolf Lueck, “Sound scattering from oceanic turbulence”, *Geophysical Research Letters*, **30**, 1343, doi:10.1029/2002GL016733, 2003.

**Tetjana Ross**, Chris Garrett and Pierre-Yves Le Traon, “Western Mediterranean sea-level rise: changing exchange flow through the Strait of Gibraltar”, *Geophysical Research Letters*, **27**:2949-2952, 2000.

*Submitted:*

Doris Leong, **Tetjana Ross** and Andone Lavery, “Anisotropy in broadband acoustic scattering from internal solitary waves”, submitted to *Journal of the Acoustical Society of America*.

**Tetjana Ross** and Andone Lavery, “High-frequency acoustic scattering from density and sound speed gradients: Applications to oceanic pycnoclines”, submitted to *Journal of the Acoustical Society of America*.

*In Preparation:*

**Tetjana Ross**, Wu-Jung Lee, Julie Keister and Ana Lopez, “Classifying scattering layers in Saanich Inlet, British Columbia using high-frequency broadband acoustics”, in preparation for *Journal of the Acoustical Society of America* (for submission in June 2011).

#### INVITED PRESENTATIONS

- **161st Meeting of the Acoustical Society of America** (in an Educational Session) (2011)
- **Institut des sciences de la mer de Rimouski, Université du Québec à Rimouski** (2011)
- **44<sup>rd</sup> Ann. Canadian Meteorological and Oceanographic Soc. Congress, Ottawa** (2010)
- **University of Hawai'i at Manoa, Honolulu** (2005)
- **University of Victoria, Victoria** (2005)
- **Invited speaker at the DIALOG VI Symposium** (2004)
- **Memorial University of Newfoundland, St. John's** (2004)
- **Dalhousie University, Halifax** (2004)
- **University of Massachusetts, Dartmouth** (2003)
- **Invited speaker at the Physical Oceanography Dissertation Symposium** (2003)
- **Oregon State University, Corvallis** (2003)
- **Woods Hole Oceanographic Institution** (2003)

#### CONFERENCE PRESENTATIONS (only first authored and in last 5 years)

- **Tetjana Ross**, Wu-Jung Lee, Ana Lara Lopez, Julie Keiser and Charles Greene, “Broadband acoustics on the VENUS observatory in Saanich Inlet”. 44th Annual Canadian Meteorological and Oceanographic Society Congress, Ottawa, Ontario, June 1 - 4, 2010, *invited talk*.
- **Tetjana Ross** and Andone Lavery, “A weak-scattering model for high-frequency backscattering from oceanic pycnoclines”. 44th Annual Canadian Meteorological and Oceanographic Society Congress, Ottawa, Ontario, June 1 - 4, 2010.
- **Tetjana Ross**, Candace Smith and Beth MacEachern, “Co-incident in-situ observations of turbulence and zooplankton with a new biophysical profiler”. 42<sup>nd</sup> Liège Colloquium on Ocean Dynamics "Multiparametric observation and analysis of the Sea", Liège, Belgium, April, 26-30, 2010.
- **Tetjana Ross** and Gareth Lawson, **Long-term broadband acoustic observations of zooplankton scattering layers in Saanich Inlet, British Columbia**. 43rd Annual Canadian Meteorological and Oceanographic Society Congress, Halifax, Nova Scotia, May 31 - June 4, 2009 **and** the 157th Meeting of the Acoustical Society of America, Portland, Oregon, 18-22 May 2009.
- **Tetjana Ross** and Andone Lavery, **High-frequency broadband acoustics for investigating double-diffusive convection**. IMPETUS 2008: Techniques in Polar Ocean Observation and Monitoring, St. Petersburg, Russia, November 19-22, 2008 **and** Second ASA-EAA joint conference Acoustics'08 Paris, France, June 29 – July 4, 2008.
- **Tetjana Ross**, Isabelle Gaboury and Rolf Lueck, **Simultaneous acoustic observations of turbulence and zooplankton**. Second ASA-EAA joint conference Acoustics'08 Paris, France, June 29 – July 4, 2008.
- **Tetjana Ross**, Anna Metaxas, Jessica Sameoto and Andria Logan, **The mysterious behavior of green sea urchin larvae**. 2008 Ocean Sciences Meeting, Orlando, Florida, March 2-7, 2008.

- **Tetjana Ross**, Andone Lavery and Ray Schmitt, **Acoustic scattering from double-diffusive staircases: News from the Lab**. 2006 Ocean Sciences Meeting, Honolulu, Hawaii, February 20-24, 2006.

### GRANTS (in last 5 years)

#### *Principal Investigator:*

2009-2013	Canadian Foundation for Innovation, Infrastructure Operating Fund	5,000 p/a
2008-2012	NSERC Discovery Grant	20,000 p/a
2008	Nova Scotia Office of Economic Development Cooperative Employment Program Project	3,311
2008	Canadian Foundation for Innovation, Leaders Opportunity Fund	312,500
2007	NSERC Research Tools and Instrumentation	78,579
2005-2007	NSERC Discovery Grant	18,800 p/a

#### *Co-applicant:*

2010-2012	NSERC Strategic Project Grants PI: Paul Hill, other co-applicant: Alex Hay	345,240
2010-2012	Canadian Foundation for Innovation, Special Operating Funds PI: Verena Tunnicliffe, 10 other co-applicants	1,249,985 p/a
2009	Canadian Foundation for Innovation, Leading Edge Fund PI: Verena Tunnicliffe, 39 other co-applicants	10,970,088
2008	German Federal Ministry of Education and Research travel funds PI: IMPETUS	~3,000
2006	US Office of Naval Research PI: A. Lavery, other co-PI: L. Goodman	325,600
Pending	NSERC Collaborative Research and Training Experience Program PI: Alex Hay, 6 other co-applicants	300,000 p/a

### JOURNALS/ORGANIZATIONS FOR WHICH I HAVE ACTED AS A REVIEWER

Limnology and Oceanography; Geophysical Research Letters; Journal of the Acoustical Society of America; Annales Geophysicae; National Science Foundation; National Science and Engineering Research Council.

### OCEANOGRAPHIC FIELD EXPERIENCE

- **participated in ten large oceanographic cruises and numerous smaller cruises**
- **proficient with standard oceanographic equipment:** echosounders, Acoustic Doppler Current Profilers, Conductivity, Temperature and Depth sensors, and plankton nets
- **familiar with specialized equipment** such as the Towed Ocean Microstructure Instrument, the CTD-mountable Microstructure Profiling System, the Microstructure Sampling System, Vertical Microstructure Profiler and two zooplankton imaging system (ZOOVIS and VPR)
- **helped prepare, deploy and recover moorings** (with bottom mounted Acoustic Doppler Current Profilers, current meters and thermistor chains)

- **directed the design and testing of a novel new instrument:** a combination of microstructure profiler and Video Plankton Recorder (VPR)

## TEACHING

- **Dalhousie University, Assistant Professor, (2005–present).**  
**OCEA/PHYC 4311/5311 Fluid Dynamics I** Fall 2007, 2009  
**OCEA 5240 Special Topics in Oceanography** Winter 2008-2011  
 I developed and coordinate a new graduate course allowing students to broaden their studies with a mix-and-match of three month-long “mini-courses”, two of which I teach.
- **WHOI/MIT Joint Program in Oceanography, Postdoctoral Teaching Fellow (2004)**  
**Introduction To Observational Physical Oceanography (12.808)**
- **University of Victoria, Dept. of Physics and Astronomy, Teaching Assistant (1998-2002)**
- **University of Manitoba, Department of Mathematics, Teaching Assistant (1996-1998)**

## SUPERVISORY EXPERIENCE

- **Supervisor**  
 Candace Smith M.Sc (Sept. 2009-present)  
 Doris Leong M.Sc (Sept. 2006- Apr. 2009)  
 Beth MacEachern Undergraduate co-op student (Winter 2010, Biology)  
 Ivan Kostylev Undergraduate co-op student (Summer 2008, Physics)  
 Caitlin Gerber Undergraduate co-op student (Summer 2006, Marine Biology)
- **Co-supervisor**  
 Robert Paterson Undergrad. co-op student (Winter 2011, Mechanical Engineering)  
 Amy Roy Combined Marine Biology/Oceanography Honours (2009-2010)  
 Edward Marchant Combined Marine Biology/Oceanography Honours (2009-2010)  
 Andria Logan Combined Marine Biology/Oceanography Honours (2005-2006)

## SCIENCE OUTREACH (2005-present)

- presenting “Sound in the ocean” to grade 4 and 4/5 classes at Le Marchant Street and Inglis Street Schools (2010)
- performing a curriculum review for a high school science chapter on Ocean Currents for the Center for Science Education (EDC, Inc., Newton, MA) (2008)
- visiting Creative Kids Elementary School (in Hammonds Plain) to talk to grades K-6 about sea ice and marine animals in the Arctic (2008)
- interviewee for a segment on the tides for an episode on the Moon as part of the History Channel’s series entitled “The Universe” (2007)
- acting as an “expert” (i.e. answering student submitted questions) for the **MadSci Network**
- taking part in the **Scientists and Innovators in the Schools** program in Halifax, NS (2005-present)
- participating in the **Woods Hole Science and Technology Education Partnership** (2003-2005)

## LEAVES

- Pregnancy/Parental (Oct. 12, 2006 – May 22, 2007)