

***Carol Paty***

Department of Earth and Space Sciences  
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**Education**

University of Washington, Seattle, WA,  
Ph.D. student in Earth and Space Sciences, 2001- present, adviser: Robert Winglee  
(Expected Defense Date, April 2006)

Bryn Mawr College, Bryn Mawr, PA,  
B.A. Physics and Astronomy, Magna Cum Laude with Departmental Honors, 2001,  
adviser: Peter Beckmann

University of St. Andrews, St. Andrews, Scotland,  
Junior Semester Study Abroad, Winter/Spring 2000

**Research****Current Research :**

*Research on the magnetic signature of Ganymede* *January 2002-present*  
Worked on 3-dimensional multi-fluid simulations to quantify the weakly magnetized/heavy ion/sub-Alfvénic interaction occurring between Ganymede's magnetosphere embedded within the Jovian magnetosphere. (Adviser: Robert Winglee, University of Washington, Dept. of Earth and Space Sciences)

*Research on the energization of plasma at Ganymede* *April 2004-present*  
Developed a technique for generating synthetic spectrograms from multi-fluid simulations for actual and hypothetical spacecraft trajectories in order to study the heating and energization of various plasma species from the Jovian magnetosphere and ionosphere of Ganymede. This can be used to identify plasma species, sources, and boundary layers observed by Galileo as well as investigate the low energy plasma population. (Adviser: Robert Winglee, University of Washington, Dept. of Earth and Space Sciences)

**Previous Research :** September 2001-January 2002, Analysis of DROPPS sounding rocket data, identifying lightning signatures in electric/magnetic field data. (Adviser: Bob Holzworth, University of Washington, Dept. of Earth and Space Sciences)

September 2000-May 2001, Low Frequency NMR experiments of organic molecules in crystal lattices to determine spin relaxation rates based on position and structure. (Adviser: Peter Beckmann, Bryn Mawr College, Physics Department)

June 2000-August 2001, Liquid water stability in pore spaces of soil and rock in a Mars-like environment. (P.I. Christopher McKay, Astrobiology Academy, NASA Ames Research Center)

June 1999-August 1999, Power efficiency analysis of SNAPLITE LED arrays and other potential light sources for bioregenerative life support systems. (P.I. Scott Young, Space Life Sciences Training Program, Kennedy Space Center)

### **Lecture Experience/Teaching/Mentoring**

#### **Invited Lectures/Seminars:**

- Southwest Research Institute Space Science Seminar entitled: 'A Tale of Two Magnetospheres: Understanding the Interaction between Ganymede's and Jupiter's Magnetospheres' (January 31, 2006, SwRI)
- Los Alamos National Lab ISR-1 Seminar entitled: 'Understanding the Complex Interaction between Ganymede's and Jupiter's Magnetospheres' (November 8, 2005, LANL)
- NASA Research Seminar Series: Rocks and Stars entitled: 'Planetary Magnetospheres; Understanding the Complex Relationship Between the Sun our Magnetosphere and Us' (April 22, 2004, University of Washington)
- NASA Research Seminar Series: Rocks and Stars entitled: 'Planetary Magnetospheres; Surviving Space Weather' (May 19, 2005, University of Washington)
- Applied Physics Lab Seminar Series: The importance of being O+: The role of heavy ions in shaping Ganymede's Magnetosphere' (June 9, 2005, University of Washington)

#### **Class Lectures:**

Have given many lectures for several courses in Earth and Space Sciences (ESS102, 205, and 471-Intro to Space Plasma Physics) over the past four years (University of Washington)

#### **Teaching:**

- Introduction to Space and Space Travel (Earth and Space Sciences 102), Fall 2002, Fall 2004 TA (University of Washington)
- Assisted with Access to Space (Earth and Space Sciences 205), Spring 2003 (University of Washington)
- Introductory Physics (Physics 103/104), Fall 2000-Spring 2001, Head TA & lab instructor (Bryn Mawr College)
- Introductory Physics (Physics 103/104), Fall 1998-Spring 2000, TA & lab instructor (Bryn Mawr College)

#### **Mentoring:**

Have helped mentor 6 undergraduates, 5 of which were female. Two are currently in graduate school (one in Astrophysical and Planetary Sciences; the other in Applied Mathematics) and the other four are currently finishing their B.S. degrees.

### **Awards/Honors**

- Howard A. Coombs Fellowship (2005), Dept. of Earth and Space Sciences, University of Washington.

- Student Technology Fee Grant Proposal fully funded (from the University of Washington) for update of graduate student computing facilities in the Dept. of Earth and Space Sciences including new desktops, a new server, new laptops and digital cameras (\$30K, 2003).
- Graduated Magna Cum Laude with Departmental Honors from Bryn Mawr College (2001).

### **Memberships/Service/Committee Appointments:**

- Member of the AGU since 2002.
- Referee for papers submitted to Geophysical Research Letters (2005-present).
- Faculty Search Committee: (2004-05) Full voting committee member involved in reading, interviewing and assessment of a large number of applicants for an open tenure track position.
- Member of the Earth and Space Sciences educational outreach group, founded by graduate students to bring hands on lectures on Earth and Space Science topics to local elementary, middle and high schools (2005-present).
- Graduate Student Representative: (2004-present) Graduate student liaison between faculty and student bodies. Involves attending faculty meetings, bringing attention to student issues, organization of certain department-wide events.
- Research Institute for Space Exploration (RISE) website design/maintain (<http://www.ess.washington.edu/RISE/>).
- Student Tech Fee Committee: (2002-03 and at present) Co-authored a proposal to update the graduate student computing facilities via acquisition of new laptops, digital cameras and a server for student use. Proposal was fully funded at ~\$30,000. Currently still administrating use of loanable items (laptops and cameras).
- Building Committee: (2003-04) Involved with design decisions for teaching labs, TA offices, and grad student offices as well as making sure to address student issues/concerns in the new building.
- Prelim Exam Committee: (2003 exams) Participated as the student observer on the departmental qualifying exams (Prelim) and solicited comments/concerns/responses to the new exam procedures for the newly merged Dept. of Earth and Space Sciences (formerly Dept. of Geological Sciences and Dept. of Geophysics).

### **Publications: Papers**

A Beckmann, C Paty, E Allocco, M Herd, C Kuranz, and A L Rheingold, 2004. The relationship between crystal structure and methyl and t-butyl group dynamics in van der Waals organic solids. *J. Chem. Phys.*, 120, 5309-5314.

Paty, C, and R Winglee, 2004. Multi-fluid simulations of Ganymede's magnetosphere. *Geophys. Res. Lett.*, Vol. 31, No. 24, L24806 10.1029/2004GL021220.

Paty, C, and R Winglee, 2005. The role of ion cyclotron motion at Ganymede: Magnetic field morphology and magnetospheric dynamics. *Geophys. Res. Lett.* (in review)

Paty, C, W Paterson and R Winglee, 2005. The role of ion cyclotron motion at Ganymede: Ion energization (in prep. for *JGR Space Physics*)

### **Publications: Conference Abstracts (Oral & Poster Presentations)**

Paty, C, R Winglee and W Paterson (2005), Plasma Energization in Ganymede's Magnetotail, Eos Trans. AGU, 86(53), Fall Meet. Suppl., Abstract SM33C-0461.

Paty, C, and R Winglee (2005), Understanding magnetic field observations of Jupiter's icy moons: Implications for Ganymede's subsurface ocean. Second Astrobiology Graduate Conference, [4].

Paty, C, R Winglee and W Paterson (2005), Quantification of Ganymede's magnetosphere including the role of ion cyclotron and heavy ion effects. Magnetospheres of Outer Planets Conference, [45].

Paty, C, and R Winglee (2004), Multi-fluid Simulations of Ganymede's Magnetosphere: The Role of Heavy Ions in the Magnetotail, Eos Trans. AGU, 85(47), Fall Meet. Suppl., Abstract SM33A-1250.

\*Stickle, A, RM Winglee, E Harnett, and C Paty (2004), Plasma sources and lifetimes within the Jovian magnetosphere, Eos Trans. AGU, 85(47), Fall Meet. Suppl., Abstract SM33A-1251.

Paty, C, R Winglee, and E Harnett, 2004. Simulation/Data Comparisons of Ganymede's Magnetosphere, Eos Trans. AGU, 85(17), Jt. Assem. Suppl., Abstract SM51A-04.

Paty, C, R Winglee, and E Harnett, 2003. 3D Multi-fluid simulations of Ganymede's magnetosphere, Eos Trans. AGU, 84(46), Fall Meet. Suppl., Abstract SM22B-0244.

\*Rachmeler, L, RM Winglee, C Paty, and E Harnett, 2003. Structure of the Jovian magnetosphere as determined by 3-D multi-fluid simulations, Eos Trans. AGU, 84(46), Fall Meet. Suppl., Abstract SM22B-0241.

Paty, C, R Winglee, and E Harnett, 2002. 3D Multi-fluid simulations of the Jovian magnetosphere, Eos Trans. AGU, 83(47), Fall Meet. Suppl., Abstract SM21A-0527.

Paty, C, R Winglee, and E Harnett, 2002. Multi-fluid simulations of the Jovian magnetosphere. Magnetospheres of Outer Planets Conference, [22].

Paty, C, C McKay, D Catling, and J Heldmann, 2000. The Stability of Liquid Water in Porous Rocks in a Mars-like Environment. ASGSB 2000 Annual Meeting Abstracts [24].

Paty, C, S Young, 1999. Characterization of Light Emitting Diodes (LEDS) for Plant Growth: Power Conversion Efficiencies of SNAPLITE LED Systems and LEDs at Different Intensities and Wavelengths. ASGSB 1999 Annual Meeting Abstracts [9].

\* Indicates undergraduate researcher.