

## **Robert M. Winglee**

**Professor, Associate Chair**  
**Associate Director of Washington NASA Space Grant**  
**Director, Research Institute for Space Exploration**  
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### **Professional Preparation.**

Ph. D., University of Sydney, 1984 ; B. Sc. (Hons.), University of Sydney, 1980

### **Appointments.**

PROFESSIONAL CHRONOLOGY (Last 10 yrs): 3/01 – present, Professor and Associate Chair, Dept. of Earth and Space Sciences, UW; Associate Director, Washington NASA Space Grant Consortium; 9/00 – 3/01 Professor, Geophysics Program, Associate Director, Washington NASA Space Grant Consortium, Associate Chair, Geophysics, 9/96 – 9/00, Assoc. Professor, Geophysics Program, Univ. of Washington; 01/00 – present Adjunct Professor, Aeronautics and Astronautics; 12/99 - present, Adjunct. Professor, Dept. of Astronomy, Univ. of Washington; 5/93—present, Adjunct. Professor, Dept. of Physics, Univ. of Washington; 12/91 - 9/96, Assist. Professor, Geophysics Program, Univ. of Washington; 5/91 - 12/91, Professional Scientist, Department of Space Sciences, Southwest Research Institute; 12/89 - 4/91 Senior Research Associate, Department of Astro., Planet. and Atmos. Sci., University of Colorado at Boulder.

### **Awards.**

DISCOVER Magazine Awards for Technological Innovation, sponsored by the Christopher Columbus Fellowship Foundation, Aerospace category, 2001.

### **Published Over 120 papers:**

#### **Recent Publications Relevant to Proposal :**

- Winglee, R. M., D. Chua, M. Brittnacher, G. K. Parks and G. Lu, Global impact of ionospheric outflows on the dynamics of the magnetosphere and cross-polar cap potential, *J. Geophys. Res.*, **107**, 10.1029/2001JA000214, 2002.
- Harnett, E. M., and R.M. Winglee. 2.5D fluid simulations of the solar wind interacting with multiple dipoles on the surface of the Moon, *J. Geophys. Res.*, **108**, 10.1029/2002JA009617, 2003.
- Winglee, R. M., Circulation of ionospheric and solar wind particle populations during extended southward IMF, *J. Geophys. Res.*, **108**, 10.1029/2002JA009819, 2003.
- Winglee, R. M., W. Lewis, and G. Lu, Mapping of the heavy ion outflows as seen by IMAGE and multi-fluid global modeling for the April 17, 2002 storm, *J. Geophys. Res.*, **110**, A12S24, doi:10.1029/2004JA010909, 2005.
- Harnett, E. M., R. M. Winglee, and C. Paty, Multi-scale/multi-fluid simulations of the post plasmoid current sheet in the terrestrial magnetosphere, *Geophys. Res. Lett.*, **33**, L21110, doi:10.1029/2006GL027376, 2006.

#### **Recent Publications in Other Interests:**

- Winglee, R. M., J. Slough, T. Ziemba, and A. Goodson, Mini-magnetospheric plasma propulsion: Tapping the energy of the solar wind for spacecraft propulsion, *J. Geophys. Res.*, **105**, 21,067, 2000.

Winglee, R. M., T. Ziemba, P. Euripides and J. Slough, "Computer Modeling of the Laboratory Testing of Mini-Magnetospheric Plasma Propulsion (M2P2)", Proc. of 27th International Electric Propulsion Conference Proceedings, IEPC-01-200, 2001.

Winglee, R. M., P. Euripides, T. Ziemba, J. Slough, and L. Giersch, "Simulation of mini-magnetospheric plasma production (M2P2) interacting with an external plasma wind," AIAA paper No. 2003-5224, July, 2003.

Ziemba, T., P. Euripides, J. Slough, R. Winglee, L. Giersch, J. Cascaden, T. Schnackenberg, S. Isley, Plasma characteristics of a high power helicon discharge, *Plasma Source Sci. Tech.*, **15**, 517, 2006.

Winglee, R., T. Ziemba, L. Giersch, J. Prager, J. Carscadden, and B. R. Roberson, Simulation and Laboratory Validation of Magnetic Nozzle Effects for High Power Helicon (HPH) Thruster, *Physics of Plasmas*, submitted, 2006.

### **Recent Invited Talks.**

Winglee, R. M., Heavy ion and ion cyclotron effects on reconnection in the Magnetotail, International Association of Geomagnetism and Aeronomy, Toulouse France, July 18-29, 2005.

Winglee, R. M., T. Ziemba, J. Prager, B. R. Roberson, N. Stobie and J. Carscadden, High power helicon plasma propulsion using nonlinear helicon waves, National Radio Science Meeting, Boulder, Colorado, Jan. 4-7, 2006.

Winglee, R. M., Ion cyclotron and heavy ion effects on tail reconnection and substorm dynamics, Earth-Sun System Exploration: Energy Transfer, Kona, Hawaii, Jan. 16-20, 2006.

Paty, C. and, R. M. Winglee, Understanding the interaction between Ganymede's and Jupiter's magnetospheres through multi-fluid simulations and observations, European Geosciences Union, Vienna Austria, April 15-20, 2006.

### **Collaborators**

(a) Collaborators: M. Brittnacher (UW), J. Burch (SwRI), D. Chua (NRL), Goodson (Boeing), R. Elson (Boeing), G. Lu (HAO), J. D. Menietti (U.Iowa), G. K. Parks (UCBerkeley), M. Wilber (UCBerkeley), J. Slough (U of W), C. Paty (SwRI).

(b) Graduate and Postdoctoral Advisors : Prof. D. B. Melrose, Prof. N. Cramer, University of Sydney Australia; Post-doc Adviser: G. Dulk, M. Ashour-Abdalla

### **Students Supervised**

10 PhD's: M. McKean, Z. Zhu, R. Elsen, A. Goodson, M. Wilber, S. Matt, E. Harnett, T. Ziemba, L. Giersch, C. Paty  
2 Masters: Q. Li, D. Collin

### **Current Graduate Students**

D. Snowden, A. Kidder, B. R. Roberson (ESS); J. Prager (Physics)

### **Undergraduate Students Mentored in Research**

J. Hughes, K. Princehouse. L. Winstrom, B. Warrick, M. Bentz, E. Suthers, H. Cummings, J. Cascaden, L. Rachmeler, M. Nivala, T. Schnackenberg, S. Isley, A. Stickle, E. Bell, M. Fabric, J. Porter