# James Edward Leake
## Astrophysicist, US Naval Research Laboratory
## Email: james.leake@nrl.navy.mil
## Website: www.mason.gmu.edu/~jleake


**Education History**

PhD in Physics. Space and Astrophysics Group, University of Warwick, UK, 2006.
MPhys in Mathematics and Physics (1st class), University of Warwick, UK, 2003.

**Employment History**

November 2014 to present: Astrophysicist, US Naval Research Laboratory.
September 2009 to November 2014: Research Assistant Professor, George Mason University.
August 2008 to August 2009: Postdoctoral Research Assistant, George Mason University.
October 2006 to August, 2008: Research Scientist, Proudman Oceanographic Laboratory, UK.

**Research Interests**

Dr. Leake's research in solar physics has centered on numerical and theoretical investigations of the dynamics and magnetism of the solar atmosphere. Current work is focused on theoretical and numerical models of the initiation of coronal mass ejections by the emergence of new magnetic flux at the solar surface. Other current work includes the effect of ion-neutral coupling in weakly ionized plasmas on magnetic reconnection and heating of the chromosphere, and the evolution of stellar chromospheres. Dr Leake has presented at domestic and international solar physics and astronomy conferences. He is also a member of an International Space Science Institute working team on the chromosphere, and has refereed articles in the Astrophysical Journal and Astronomy and Astrophysics Journal.

**Selected Publications**

- "*Ionized Plasma and Neutral Gas Coupling in the Sun's Chromosphere and Earth's Ionosphere/Thermosphere,"* Leake, J.E., DeVore, C.R., Thayer, J.P, et al., Space Science Reviews (2014), 184, p107-172.
- *"Distribution of Electric Currents in Solar Active Regions*," Torok, T. et al., Astophysical Journal (2014), 782, L10.
- "*Simulations of Emerging Magnetic Flux. II: The formation of unstable coronal flux ropes and the initiation of CMEs,*" Leake, J. E., Linton, M. G., Astrophysical Journal, (2014), 787, p46.
- "*Simulations of Emerging Magnetic Flux. I: The formation of stable coronal flux ropes,*" Leake, J.E., Linton, M. G., Torok, T., Astrophysical Journal, (2013), 778, p99.
- "*Magnetic Reconnection in a Weakly Ionized Plasma*," Leake, J. E., Lukin, V. S., Linton, M. G., Physics of Plasmas, (2013), 20, 061201.
- "*Effect of Ion-Neutral Collisions in Simulations of Emerging Active Regions,"* Leake, J. E., Linton, M. G., Astrophysical Journal, (2013), 764, 54.
- "*Multi-fluid Simulations of Chromospheric Magnetic Reconnection in a Weakly Ionized Reacting Plasma*," Leake, J. E., Lukin, V. S., Linton, M. G., Meier, E. T., Astrophysical Journal, (2012), 760, 109.
- "*Tests of Dynamical Flux Emergence as a Mechanism for Coronal Mass Ejection Initiation*," Leake, J. E., Linton, M. G., Antiochos, S. K., Astrophysical Journal, (2010), 722, 550.
- "*Emergence of a Flux Tube through a Partially Ionized Solar Atmosphere*," Arber,T.D., Haynes,M., Leake, J.E., Astrophysical Journal, (2007), 666, 541.
- "*The emergence of magnetic flux through a partially ionized solar atmosphere,*" Leake, J. E., Arber, T. D., Astronomy and Astrophysics, (2006), 450, 805.
- "*Collisional dissipation of Alfvén waves in a partially ionised solar chromosphere,"* Leake, J.E., Arber, T.D, Khodachenko, M.L., Astronomy and Astrophysics (2005), 442, 1091.

**Invited presentations**

- Asia-Oceania Geophysical Society Meeting, Singapore, 2015, *"Modeling the solar chromosphere: Beyond the ideal MHD description."*
- International Astronomy Union Meeting, Honolulu, HI, 2015, *"Modeling the solar chromosphere: Beyond the ideal MHD description."*
- Hinode/LWS Meeting, Portland, OR, 2014, *"The role of the chromosphere in the energization of the corona."*

**Collaborators**

Mark Linton, Vyacheslav Lukin, Naval Research Laboratory.
Spiro Antiochos, Jim Klimchuk, Holly Gilbert, NASA Goddard Space Flight Center.
Tibor Torok, Zoran Mikic, Predictive Science Inc.