

## **Dr. Aaron Michael Schinder**

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### **Overview:**

- Recent PhD with electric propulsion and experimental plasma physics experience. Seeking hands-on research and development position. Willing to relocate.

### **Experience:**

#### Sep 2016 - Present: Aerospace Engineer, Chemical and Thermal Propulsion Systems Branch, NASA Glenn Research Center (GRC/LTR0)

- Engineer and analyst working on the Orion project. Performed analysis, modeling, and engineering support for the development of the propulsion subsystem of the European Service Module. Modeled prop feed-system water-hammer, pressurization system and engine performance. Chief data analyst for European Service Module propulsion qualification test.

#### Fall 2011 - Sep 2016: PhD Student, High Power Electric Propulsion Lab, Georgia Institute of Technology

- Joint PhD student of Prof Mitchell Walker's High Power Electric Propulsion Lab, and Prof Julian Rimoli's Computational Solid Mechanics Lab.
- Studied the physical processes behind the erosion of channel wall materials in Hall effect thrusters (HETs). Computational and experimental basic research into plasma-material interactions with application to life limiting processes.
- Experience with electric propulsion devices, plasma device physics, space plasma physics, and modeling and simulation. Wrote POSIX threaded parallel C++ engineering simulations to predict surface features developed during plasma erosion of a heterogeneous borosil microstructure. Other simulation experience with molecular dynamic simulation of grain boundary energy in metals. C, C++, FORTRAN and Python experience, as well as experience with numerical libraries such as LAPACK.
- Coursework in fusion plasma physics, space plasma physics, spacecraft electric propulsion, laser physics, and advanced orbital mechanics.
- Assisted with data collection in testing of Hall effect thrusters. Experienced with Solidworks and 3-axis mill and lathe. Designed and machined test fixtures for research.

#### Summer 2011: Intern through Aerotek for Ball Aerospace, AFRL Laser Effects Research Branch.

- Developed FORTRAN plug-in and Python wrapper for ABAQUS FEM software, enabling the simulation of high energy laser burn-through of multi-wall structures.

#### Mar 2007 - Dec 2011: USAF Officer, Laser Effects Engineer, AFRL Laser Effects Research Branch

- Obtained DoD security clearance.
- Project officer and principal investigator for an exploratory study. Planned and executed a year-long multi-part test effort on coupon level samples, searching for an effect of interest to the Air Force.
- Project officer, analyst and experimenter for several tests. On the MANPADS test, a major outdoor testing program, I performed analysis on expectations for rocket thrust and nozzle ejection velocity, and briefed the air base wing commander and senior civilian division director on safety and risk mitigation for the test, enabling the test to proceed.
- Worked on both individual research and on large test teams.
- Optics and high-energy laser experience. Experience analyzing thermal infrared (LWIR, MWIR), NIR, and UV cameras.

## Education, Credentials, and Awards:

- PhD, Aerospace Engineering, Georgia Institute of Technology, Fall 2016.
- National Defense Science and Engineering Graduate Fellow, American Society of Engineering Education, Sep 2013 to Sep 2016.
- MS, Aeronautical Engineering, High Power Electric Propulsion Lab, Georgia Institute of Technology, Atlanta GA, 2013. GPA: 3.93.
- BS Astronautical Engineering, Major Concentration: Propulsion, Minor Concentration: Structures, Minor in Economics, Purdue University, West Lafayette IN, 2006. GPA 3.91.
- Engineer Intern License, ET30707657, Indiana Professional Licensing Agency
- Directed Energy Directorate, 3rd Quarter Scientist and Engineer Award, AFRL Directed Energy Directorate, Nov 2009.
- Directed Energy Directorate 4th Quarter Technical Teamwork Award, AFRL Directed Energy Directorate, Dec 2007.

## Skills, Interests, Activities:

- Experience programming, compiling, and running simulation software in Windows and Linux environments. C, C++, FORTRAN, Matlab, and Python languages. Developed engineering simulations, and designed websites: [www.republicedm.com](http://www.republicedm.com), [www.amssolarempire.com](http://www.amssolarempire.com), and others.
- Experience with Solidworks, Fluent, 3-axis mill and lathe. Designed and built test fixtures for experiments. Strain gages, thermocouples, plasma diagnostics, microscopes, and other lab instruments.
- Math tutor, Highland High-school, Albuquerque NM 2008-2011, currently tutoring one-on-one.
- Enrolled in flying lessons, anticipate award of private pilot's license summer 2016.
- Interests: 3D printing, cryptography, physics, space exploration.
- Chair of Albuquerque AIAA chapter, 2010-2011.

## Publications

- Publication: Schinder, Aaron, Walker, M., Rimoli, J. "3D Model for Erosion of a Hall Effect Thruster Discharge Channel Wall." *Journal of Propulsion and Power*, 2014. doi:10.2514/1.B35098.
- Publication: Schinder, Aaron, Walker, M., Rimoli, J., "3D Model for Atomic Sputtering of Heterogeneous Ceramic Compounds." *49th AIAA/ASME/SAE/ASEE Joint Propulsion Conference*. American Institute of Aeronautics and Astronautics, 2013. DOI 10.2514/6.2013-4127.

## References

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