

S. Solter (Hunt)

+1-(510)-500-2011; hunt@astroplane.org

EDUCATION **University of Iceland**, Reykjavík, Iceland
Doctorate in Plasma Physics

Embry-Riddle Aeronautical University, Remote
Master of Science in Software Engineering (GNC Algorithms), PPL, IFR, aerobatic training

University of California, Berkeley, Berkeley, CA
Bachelor of Science in Astrophysics

WORK

University of Iceland, Remote: *PhD Candidate, plasma physics* 1/2021 – Current

- Particle-in-cell Monte Carlo collision numerical modeling of electron and ion dynamics and processing of large datasets
- Simulation of ion populations and double layer dynamics (CMEs) in plasma physics discharges
- Cluster computer scripting and data management in Linux and Microsoft Visual Studio
- Analysis and modeling in MATLAB for plasmas in semiconductors, the ionosphere, and heliophysics

SearchPros, Remote: *Software Engineer and Consultant* 2/2022 – Current

- Web data management in SQL to optimize engineering changes, automation of engineering tasks, and airworthiness
- Azure DevOps and Git management of bugs, user change requests, UI development, and Agile continuous improvement
- Full-stack and back-end development of complex IDEs with numerous databases in Python, SQL, HTML, JavaScript
- Provide consulting for engineering root causes, single event effects, and radiation dosage of electronics

Astroplane, Seattle, WA: *Physics consultant and Founder* 01/2019 – Current

- Geomagnetic activity awareness outreach and mitigation for satellite, airline, and power grid operators
- Provide physics consulting and grant writing for aerospace and science organizations
- Automation and augmentics in partnership with The Institute for Human and Machine Cognition
- Geophysics and geolocation system development, feasibility, and test in Unity/Python
- Development and tuning of an EKF (Extended Kalman filter), Python data management system, flight test data analysis

Air Force Research Laboratory, Kirtland Air Force Base, Albuquerque, NM: *Research Associate* 6/2017 – 01/2020

- Optical emission excitation cross section calculations for collisional radiative modeling for plasma plume electron temperature diagnostics and ion populations using an Air Force supercomputer/Linux/C++/custom software packages
- Atmospheric and Low Earth Orbit chemistry data processing, experimentation, and simulation analysis
- Digital signal processing for radiofrequency technologies, UV cameras, spectrometers, and numerically controlled oscillators
- Gaussian spectral waveform analysis, noise reduction, calibration, fitting, and fourier transforms
- Daily work with high voltage, high pressure thermal and fluid systems and vacuum chambers involving propellant tanks, pressure regulators, turbo pumps, ion gauges, thermocouples, Wien filters, Faraday Cups, quadrupoles, Retarding Potential Analyzers, Channeltrons & kerosene cooling systems, while optimizing the safety of such systems/operations
- Colliding and combining foreign propellants and subsequent chemical monitoring and analysis transitioned to stakeholders
- Managing and operating complex software and hardware experimental testbed and completing data modeling, involving high-performance supercomputing simulations and managing large data sets in C++, Igor Pro, LabVIEW, SIMION, Diatomic, & LAMMPS
- Advanced propulsion system R&D for HETs, colloid thrusters, RF thrusters, and hydrazine interactions
- Design of on-board NEA (negative electron affinity) oxygen and diamond drag sensors to improve the location reliability of Air Force satellites

NASA Space Sciences Laboratory, UC Berkeley, CA: *Stardust Space Mission Researcher* 11/2012 – 1/2014

- Analysis and aerogel extractions of comet grains and interstellar medium particles from the SRC (sample return capsule)
- CNC (computer numerical control) MATLAB micromanipulator design, test, and implementation for aerogel cutting
- Used the Advanced Light Source synchrotron at the Lawrence Berkeley National Laboratory and scanning and transmission electron microscopes to determine the chemical composition and structure of these samples via spectroscopy

RESEARCH & INTERNSHIPS

- **L3Harris** Wrote and ran test procedures on spaceflight hardware and magnetic shielding for the world's largest hall effect thrusters and ion propulsion engines
- **FAA** Managed the NextGen Flight Testbed to complete Phase 1 of an IFR mission to increase flight efficiency for simultaneous, closely spaced parallel landings of commercial airliners, "Paired Approach"
- **Yale University** Conducted observational astrophysics, performed analysis and applied complex algorithms to celestial objects at many observatories (ALMA, the VLT, Gemini, Cerro Calan, La Silla), and discovered supernovae
- **Leuschner Observatory** Compiled a Hubble sequence of galaxies, observed and imaged complex astronomical objects with IDL and Linux, monitored telescope use, and resolved calibrating issues with the dome and telescope

PUBLICATIONS *Chemi-luminescence Measurements of Hyperthermal Oxygen and Xenon Collision Systems*, *Solvated Ion Cluster Dissociation Rates for Ionic Liquid Electrospray Propellants*, *Potential Perturbation of the Ionosphere from Megaconstellations and Corresponding Artificial Reentry Plasma Dust*

TECHNICAL PROFICIENCIES MATLAB/Simulink, C++, SQL, SQL Server Management Studio, Microsoft Visual Studio IDE, Python, PyCharm, Flask API, Git, Subversion, LabVIEW, Linux, Unix, Agile, Microsoft Azure, Unity, grant writing

CURRENT TEXTBOOKS *Principles of Plasma Discharges and Materials Processing* (Lieberman and Lichtenberg), *Fundamentals of Plasma Physics* (Bellan), *Earth's Magnetosphere: Formed by the Low-Latitude Boundary Layer* (Keith and Heikkila), *The Handbook of the Solar-Terrestrial Environment* (Kamide and Chian)

INTERESTS plasma physics, heliophysics, satellite pollution, space industry pollution, solar energetic particles, solar physics, geomagnetic monitoring and mitigation, astrodynamics, solar cells, climate, plasma etching, CMEs, solar flare propulsion, astronavigation, OES (optical emission spectroscopy), MCNP (Monte Carlo N-particle simulations), laboratory generation of astrophysical plasmas

CAREER GOALS Encourage multidisciplinary physics, pursue development of laboratory generated heliophysics, raise awareness and increase regulation of space industry pollution, pursue global mitigation of severe geomagnetic activity, pursue the development of multidisciplinary and heliophysics research institutes, pursue the increase of solar and magnetic observatories

TEACHING

- NASA heliophysics teacher for high school girls from 2013 - 2015
- Smithsonian planetarium speaker, code developer, and script writer from 2014 - 2016
- Graduate teaching assistant for wind tunnel laboratory 2016 - 2017

AWARDS

- Full scholarship to UC Berkeley for 4 years
- Partial FAA scholarship to ERAU for 1 year
- Polar Suborbital Science in the Upper Mesosphere Astronaut-Scientist Class 1702
 - Astronaut development program to test spacesuits/space flight simulators, complete hypoxia training and zero-g flights
- Multiple patent awards

MEDIA

- Op-ed for The Guardian: <https://www.theguardian.com/commentisfree/2024/apr/16/dead-satellite-space-earth-magnetic-field>
- Articles and interviews for Space.com, Spaceweather.com, Live Science, etc