LUBOS BRIEDA

Falls Church, VA, 661-202-9812, lbrieda@yahoo.com

QUALIFICATIONS

Scientific computing, computational fluid dynamics, plasma physics, rarefied gas transport, spacecraft contamination control, data visualization, web design

EMPLOYMENT

2009-Present, Contamination Engineer, MEI, ***NASA Goddard SFC****, Greenbelt, MD*
Contamination support for GOES-R space weather instrument suite including analysis of molecular transport and environmental test support. Analysis of particulate contamination transport for Magnetospheric MultiScale (MMS) mission. Part-time position.

2008-Present, President, ***Particle In Cell Consulting LLC****, Falls Church, VA*
Development of codes for analyzing plasma and rarefied gas flows, including a 2D solver Starfish. Technical support for AFRL Draco 3D electric propulsion plume analysis code.

2005-2008, Senior Engineer, ERC Inc., ***Air Force Research Laboratory****, Edwards, CA*
Primary developer of an electrostatic particle-in-cell code for modeling plasma plumes and their interaction with spacecraft components (Coliseum/Draco). Support of A/F electric propulsion flight project including plume modeling, spacecraft interaction modeling, and validation using experimental data. Sysadmin of a 32-CPU Linux cluster.

EDUCATION

2012, Ph.D., Mech. and Aero. Eng., *The George Washington University*, Washington, D.C.
Thesis: *Multiscale Modeling of Hall Thrusters*

2005, M.S. Aerospace Engineering, *Virginia Tech*, Blacksburg, VA
Thesis: *Development of the DRACO ES-PIC Code and Fully-Kinetic Simulation of Ion Beam Neutralization*

2003, B.S. Aerospace Engineering, Minor Mathematics, *Virginia Tech*, Blacksburg, VA

2000, Transfer Credits, Space Science, *Florida Institute of Technology*, Melbourne, FL

SKILLS

Advanced knowledge of Java, C/C++, Matlab, and various web-based platforms (PHP, SVG, SQL, etc.). Exposure to Python, Fortran, and Perl.

Extensive knowledge of numerical methods for simulating rarefied gases and plasmas, including Particle In Cell (PIC), Monte Carlo Collisions (MCC / DSMC), computational fluid and magnetohydrodynamics (CFD / MHD), mesh generation, finite difference / volume

Experience with MPI, multithreading, and OpenMP, basic knowledge of CUDA. Developer of several VTK-based visualization tools. Experience using Paraview, Tecplot, and Siemens NX.

RESEARCH

2008-2012, Doctoral Student, ***The George Washington Univ.****, Dr. Michael Keidar*
Multiscale modeling of electron transport in magnetically confined plasmas with application to Hall Effect thrusters. Studied propagation of chemically reacting cold atmospheric plasma

jets. Numerical support to an ongoing effort to characterize and space-qualify a novel vacuum arc thruster for microsatellites.

2002-2005, Graduate Research, ***Virginia Tech****, Advisor: Dr. Joseph Wang*
Developed plasma simulation code for modeling electric propulsion plumes and their interaction with spacecraft components, Draco. Utilized cut cell approach to resolve complex geometries. Performed fully-kinetic study of ion beam neutralization in an ion thruster. Also studied plume contamination on the Dawn spacecraft. Developed 3D data visualization software, capVTE for collaborative immersed visualization of scientific data.

OTHER

Member of AIAA, Sigma Gamma Tau, and Tau Beta Pi

Fluent in English and Slovak; intermediate Spanish and Russian; elementary German and Mandarin. US citizen.

Founder of Particle In Cell Consulting LLC (particleincell.com), consulting group dedicated to hybrid particle/fluid based approaches to solving challenging fluid dynamic problems. Also a blog dedicated to scientific computing and data visualization.

Founder of Slovak Cooking (slovakcooking.com), the world's largest English-language Slovak recipe site. Currently working on a cookbook to be released by Christmas 2012.

Active in the Washington D.C. community, co-organizer for D.C. area Slovak Meetup group, hike leader for several hiking clubs, member of various professional associations

Reviewer for AIAA Journal of Thermophysics and Heat Transfer

SELECTED PUBLICATIONS

L. Brieda, S. Pai, and M. Kiedar, "Kinetic Analysis of Electron Transport in a Cylindrical Hall Thruster", *IEEE Transaction in Plasma Science,* 6th special issue on Images in Plasma Science, vol. 39, no. 11, 2011

L. Brieda, and M. Keidar, "Plasma-wall interaction in Hall thrusters with magnetic lens configuration", *Journal of Applied Physics*, vol. 111, no. 123302, 2012

L. Brieda, A Barrie, D. Hughes, and T. Errigo, "Analysis of particulate contamination during launch of the MMS mission," *SPIE Optics and Photonics*, August 1-5, 2010, San Diego, CA, SPIE-7794-23

L. Brieda and M. Keidar, "One Dimensional Model of Atmospheric Low Temperature Plasma Jet," *37th International Conference on Plasma Sciences*, June 20-24, 2010, Norfolk, VA, ICOPS-2010-3P-56 (poster)

L. Brieda, and J. Wang, "Modeling Ion Thruster Beam Neutralization Using a Fully Kinetic ES-PIC Code," *41st Joint Propulsion Conference*, Tucson, AZ, July 2005, AIAA-2005-4045

L. Brieda, J. Pierru, R. Kafafy, and J. Wang, "Development of the Draco Code for Modeling Electric Propulsion Plume Interactions," *40th Joint Propulsion Conference*, Ft. Lauderdale, FL, July 2004, AIAA-2004-3633

J. Wang, L. Brieda, R. Kafafy, and J. Pierru, "A Virtual Testing Environment for Electric Propulsion-Spacecraft Interactions," *42nd AIAA Aerospace Sciences Meeting and Exhibit*, Reno, Nevada, Jan. 5-8, 2004, AIAA-2004-652