DREW RYAN JONES

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EDUCATION

PhD   The University of Texas at Austin, Aerospace Engineering, 4.0 GPA   2013
A Dynamical Systems Theory Analysis of Coulomb Spacecraft Formations
Advisor: Dr. Cesar Ocampo

MSE   The University of Texas at Austin, Aerospace Engineering, 3.86 GPA   2010

BSE   Arizona State University, Aerospace Engineering, 3.47 GPA   2008

Specialized Graduate Coursework: Numerical Optimization, Optimal Spacecraft Trajectories, Celestial Mechanics, Optimal Control Theory, Statistical Estimation Theory, Satellite Geodesy, Design Automation and Optimization, Nonlinear Dynamical Systems, and Orbit Determination.

EMPLOYMENT

Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA
Member of the Technical Staff, Mission Design and Navigation Section   2013-
Supervisors: Tung Han Yu, Tomas Martin-Mur
- Navigation analyst for Psyche, Maven, Mars2020, and RedDragon projects
- Orbit determination lead for Solar Probe Plus project
- Mission design capture-lead for 2015 Discovery opportunity proposal
- Mission design research technologist
- Principal architect of Nova (a multi-mission navigation software framework in Python)

Applied Physics Laboratory, Laurel, MD
NASA Internship, Supervisor: Dr. Robin Vaughan   2009-2009
- Mission design for multi-disciplinary feasibility study of a Uranus orbiter mission
- Guidance and control engineer for Radiation Storm Belt Probes project (Earth orbiter)

Honeywell Aerospace, Glendale, AZ
Subcontract Software Engineer, Supervisor: Larry Yust   2008-2008

Honeywell Aerospace, Tempe, AZ
Test Engineer Internship, Supervisor: Scott Martin   2005-2007

Arizona State University / NASA, Tempe, AZ
NASA Space Grant Internship, Supervisor: Candace Jackson   2003-2007

RESEARCH AND TEACHING EXPERIENCE

Research interests: Computational astrodynamics, dynamical systems theory, optimal control of cooperative spacecraft, low-thrust trajectory optimization, mixed-integer and branching techniques

applied to trajectory and space systems optimization.

Arizona State University, Tempe, AZ   2017
- **Invited guest seminar**
- Topics: Computational astrodynamics, trajectory design, and celestial mechanics

The University of Texas at Austin and NASA JSC, Austin, TX   2009-2010
- **Research Assistant**, Advisor: Dr. Cesar Ocampo
- Develop methods/software for targeting anytime, fuel optimal, Moon to Earth trajectories

The University of Texas at Austin, Austin, TX   2008-2010
- **Teaching Assistant,** Department of Aerospace Engineering
- Performed lectures to 40+ students, assisted in grading, and held regular office hours
- Courses: Statics, Flight Controls, Celestial Mechanics, and Spacecraft Dynamics

AWARDS AND RECOGNITIONS

Winning team - 7th International Global Trajectory Optimisation Competition	2014
NASA RHG Exceptional Achievement in Engineering - MAVEN Team	2014
NDSEG Graduate Research Fellowship National award from the Department of Defense	2010-2013
Cockrell School of Engineering Graduate Fellowship	2008-2010
Fulton Undergraduate Research Fellowship	2007-2008
ASU Provost Scholarship	2003-2008
Worth and Dot Howard Scholarship	2003-2008

PROFESSIONAL INVOLVEMENT

Society Affiliations:

- American Institute of Aeronautics and Astronautics Member   2006-
- American Astronautical Society Member   2010-

External Reviewer:

- AIAA Journal of Guidance, Control, and Dynamics
- IEEE Transactions on Aerospace and Electronic Systems
- ASCE Journal of Aerospace Engineering

COMPUTER SKILLS AND FLUENCIES

Astrodynamics Software: MONTE and SPICE/NAIF toolkits (JPL), Copernicus, GMAT, STK/Astrogator, SOAP, SGP4 propagation, and various optimization and targeting libraries

Programming: Linux/Windows/MacOS, Python, Git, Subversion, C-shell, Bash, Fortran, C++, Java, Matlab, Simulink, LaTeX, and Mathematica

PUBLICATIONS

Journal Articles:

D.R. Jones, "Probability of a Spacecraft Collision at Mars," submitted to *Journal of Guidance, Control, and Dynamics,* January 2018.

D.R. Jones, "Trajectories for Flyby Sample Return at Icy Moons," *Journal of Spacecraft and Rockets,* Vol. 55, No. 3, 2018, pp. 529-540.

M. Jesick, S. Demcak, B. Young, **D.R. Jones**, et al. "Navigation Overview for the Mars Atmosphere and Volatile Evolution Mission," *Journal of Spacecraft and Rockets,* Vol. 54, No. 1, 2017, pp. 29-43.

D.R. Jones and H. Schaub, "Collinear Three-Craft Coulomb Formation Stability Analysis and Control," *Journal of Guidance, Control, and Dynamics,* Vol. 37, No. 1, 2014, pp. 224-232.

D.R. Jones and H. Schaub, "Periodic Relative Orbits of Two Spacecraft Subject to Differential Gravity and Electrostatic Forcing," *Acta Astronautica,* Vol. 89, August-September 2013, pp. 21-30.

D.R. Jones and H. Schaub, "Optimal Reconfigurations of Two-Craft Coulomb Formations along Manifolds, *Acta Astronautica*, Vol. 83, February-March 2013, pp. 108-118.

D.R. Jones and C. Ocampo, "Optimization of Impulsive Trajectories between a Circular Orbit and a Hyperbolic Asymptote," *Journal of Guidance, Control, and Dynamics,* Vol. 35, No. 1, January-February 2012, pp. 234-244.

Conference Papers:

S. Hernandez, S. Campagnola, and **D.R. Jones**, " An Analytical Approach to the Ballistic Cycler Problem," *AAS/AIAA Spaceflight Mechanics Meeting*, Ka'anapali, HI, January 2019.

P. Valerino, P. Thompson, **D.R. Jones**, et al., "Charting a Course to the Sun: Flight Path Control for Parker Solar Probe," *AAS/AIAA Spaceflight Mechanics Meeting*, Ka'anapali, HI, January 2019.

D.R. Jones, S. Hernandez and M. Jesick, "Low Excess Speed Triple Cyclers of Venus, Earth, and Mars," *AAS/AIAA Astrodynamics Specialists Conference*, Stevenson, WA, August 2017.

D.R. Jones, P. Thompson, T. Goodson, et al., "Orbit Determination Covariance Analyses for the Parker Probe Mission," *AAS/AIAA Astrodynamics Specialists Conference*, Stevenson, WA, August 2017.

S. Hernandez, **D.R. Jones** and M. Jesick, "One Class of Io-Europa-Ganymede Triple Cyclers," *AAS/AIAA Astrodynamics Specialists Conference*, Stevenson, WA, August 2017.

P. Thompson, **D.R. Jones**, T. Goodson, et al., "Parker Solar Probe Navigation: One Year From Launch", *AAS/AIAA Astrodynamics Specialists Conference*, Stevenson, WA, August 2017.

P. Valerino, P. Thompson, **D.R. Jones**, et al., "Flight Path Control Analysis for Parker Solar Probe", *AAS/AIAA Astrodynamics Specialists Conference*, Stevenson, WA, August 2017.

A. Petropoulos, D. Grebow, **D.R. Jones**, et al., "GTOC9: Methods and Results from the Jet Propulsion Laboratory Team," *31st International Symposium on Space Technology and Science*, Matsuyama, Japan, June 2017.

J. Thangavelautham, A. Rhoden and **D.R. Jones**, "The Opportunities and Challenges of GNC on a Europa Cubesat," *AAS Guidance and Control Conference*, Breckenridge, CO, February 2017.

D.R. Jones, T. Goodson, P. Thompson, P. Valerino and J. Williams, "Solar Probe Plus: Unique Navigation Modeling Challenges," *AIAA Astrodynamics Specialists Conference*, Long Beach, CA, September 2016.

D.R. Jones, "Trajectories for Europa Flyby Sample Return," *AIAA Astrodynamics Specialists Conference*, Long Beach, CA, September 2016.

D.R. Jones, "Trajectories for Flyby Sample Return at Saturn's Moons," *AIAA Astrodynamics Specialists Conference*, Long Beach, CA, September 2016.

M. Jesick, S. Demcak, B. Young, **D.R. Jones**, et al. "Maven Navigation Overview," *AAS Space Flight Mechanics Meeting,* Napa, CA, February 2016.

D.R. Jones, T. Lam, N. Trawny and C. Lee, "Using MAVEN Onboard Telemetry for Orbit Determination," *AAS Space Flight Mechanics Meeting,* Williamsburg, VA, January-February 2015.

D.R. Jones and H. Schaub, "Periodic Relative Orbits of Two Spacecraft Subject to Differential Gravity and Coulomb Forces," *5th International Conference on Spacecraft Formation Flying Missions and Technologies*, Munich, Germany, May 2013.

D.R. Jones and H. Schaub, "Collinear Three-Craft Coulomb Formation Stability Analysis and Control," *AIAA/AAS Astrodynamics Specialist Conference*, Minneapolis, MN, August 2012.

D.R. Jones, "Optimal Reconfigurations of Coulomb Formations along Invariant Manifolds," *AAS Space Flight Mechanics Meeting,* Charleston, SC, January-February 2012.

D.R. Jones and C. Ocampo, "Optimal Impulsive Escape Trajectories from a Circular Orbit to a Hyperbolic Excess Velocity Vector," *AAS/AIAA Astrodynamics Specialist Conference*, Toronto, Canada, August 2010.

COMMUNITY OUTREACH

Seminar to students and faculty of Arizona State University, Tempe, AZ   2017
An interactive lecture about orbital mechanics jointly with ASU's College of Engineering and College of Earth and Space Exploration.

Subject Matter Expert for NASA Digital Learning Network, Pasadena, CA   2014-

Classroom 'virtual visits' to discuss science and encourage the next generation of scientific minds.

University of Texas Women in Engineering *GLUE Program*, Austin, TX   2012-2012
Mentor in program to expose undergraduate women to technical research.

NASA Space Grant, Phoenix, AZ   2006-2007
Self-developed project to instruct underprivileged children in the fundamentals of rocketry.