

David K. Geller
Utah State University
Mechanical and Aerospace Engineering Department
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PROFESSIONAL EXPERIENCE:

2004-present **Utah State University**, Logan, UT
Assistant Professor, Mechanical and Aerospace Engineering
Teaching and research in spacecraft guidance systems, navigation systems,
and trajectory design for rendezvous, docking, and atmospheric entry.

Grants and Awards

- “GN&C Linear Covariance Analysis For Autonomous Landing and Hazard Avoidance Technology (ALHAT)”, NASA, 2007, **\$56,543**
- “Autonomous Space Quality Imagery for LEO/GEO Operations”, AFOSR, 2007, **\$133,547**
- “Performance of Concepts and Technology Areas Related to Spacecraft Maneuvering and Formation Flying”, NRO, 2006, **\$39,640**
- “Rapid GNC Analysis For Space Missions”, NASA, 2006, **\$167,300**
- “Engagement Scenarios for Space Situational Awareness”, SDL/ARFL, 2006, **\$36,026**
- “GN&C Linear Covariance Analysis For Autonomous Landing and Hazard Avoidance Technology ”, UT/NASA, 2006, **\$30,000**
- “GN&C Algorithm Development and Mission Design for Orbital Inspection and Rendezvous”, Lockheed Martin, 2006, **\$99,113**

Teaching

- Advanced Dynamics (MAE 3320)
- Space Navigation (MAE 6560)
- Advanced Astrodyanmics (MAE 6540)
- Optimal Spacecraft Guidance (MAE 6930)
- Beginning Algebra (Math 0900 Distance Education)

- 2006 **NASA/Headquarters, Washington, D.C.**
Consultant for NASA's Independent Program Assessment Office (IPAO): Served on the Magnetospheric MultiScale Mission (MMS) Independent Review Team (IRT)
- 2005 **NASA/Headquarters, Washington, D.C.**
Consultant for NASA's Independent Program Assessment Office (IPAO): Served on the Hubble Robotic Servicing and De-orbit Mission (HRSDM) Independent Review Team (IRT)
- 1998-2004 **The Charles Stark Draper Laboratory, Cambridge, MA**
Senior Member Technical Staff
Trajectory design and guidance, navigation and control system design and analysis for civilian and military space applications (Mars Science Laboratory/JPL, Orbital Express/DARPA, Mars Sample Return/JPL, Mars Airplane/LaRC)
- 1993-1998 **Rice University, Houston, TX**
Ph.D. studies and research (see Education Section below)
- 1990-1993 **NASA's Johnson Space Center, Houston, TX**
Deputy Chief, Spacecraft Performance Analysis Branch
Trajectory design, guidance, navigation and control system design and analysis for the Lunar Mars Exploration Program
- 1984-1990 **NASA's Johnson Space Center, Houston, TX**
Aerospace Engineer
Trajectory design, guidance, navigation and control system design and analysis for civilian applications (Space Shuttle, Space Station, Advanced Launch System, GPS)

EDUCATION:

- May 1999 **Rice University, Houston, TX**
Ph.D. in Space Physics and Astronomy
Dissertation: "Classical Electron-Ion Scattering in Strongly Magnetized Plasmas: A Generalized Coulomb Logarithm and Gaunt Factor"
Supervisor: Dr. Jon Weisheit
- May 1984 **The University of Texas at Austin, Austin, TX**
M.S. in Aerospace Engineering and Engineering Mechanics
Master's Thesis: "Computer Aided Control System Design"
Supervisor Dr. Jason Speyer
- May 1982 **B.S.** in Aerospace Engineering and Engineering Mechanics
Areas of Concentration: Numerical Methods, Orbital Mechanics

PUBLICATIONS

S. Jenkins, D. Geller, "A Performance Comparison of Navigation and Targeting Algorithms for Orbital Rendezvous and Proximity Operations", Submitted to the Journal of Guidance, Dynamics, and Control, September 2007

D. Geller, "Advancements in Linear Covariance Analysis Techniques with Applications to Orbital Rendezvous", Submitted to the Journal of Guidance, Dynamics, and Control, August 2007

D. Woffinden, D. Geller, "Observability Criteria for Angles-Only Navigation", Submitted to IEEE Transactions on Aerospace and Electronic Systems, August 2007

D. Woffinden, D. Geller, "Navigating the Road to Autonomous Orbital Rendezvous", Journal of Spacecraft and Rockets, Vol. 44, No. 4, 2007

D. Woffinden, D. Geller, "Relative Angles-Only Navigation and Pose Estimation for Autonomous Orbital Rendezvous", Journal of Guidance, Control and Dyn., Vol. 30, No. 5, 2007.

N. Stastny, D. Geller, "Autonomous Optical Navigation at Jupiter: A Linear Covariance Analysis", Accepted to the Journal of Spacecraft and Rockets, October 2006

D. Geller, "A Brief Study of Ground Controlled Orbital Rendezvous: When is Autonomy Required?", Journal of Guidance, Control and Dyn., Vol. 30, No. 4, 2007.

D. Geller, "Analysis of the Relative Attitude Estimation and Control Problem for Satellite Inspection and orbital Rendezvous", Journal of Astronautical Sciences, Vol. 54, No. 3, 2007

D. Geller, "Linear Covariance Techniques for Orbital Rendezvous Analysis and Autonomous Onboard Mission Planning", Journal of Guidance, Control and Dyn., Vol. 29, No. 6, 2006.

D. Geller, J. Weisheit, "Classical Electron-Ion Scattering in Strongly Magnetized Plasmas". Paper published in the Physics of Plasmas Journal, Vol. 4, December, 1997.

K. Byun, B. Wie, D. Geller, J. Sunkel, "Robust H(infinity) Control Design for the Space Station with Structured Parameter Uncertainty", Journal of Guidance, Control and Dyn., Vol. 14, No. 6, 1991.

B. Wie, K. W. Byun, V. W. Warren, D. Geller, D. Long, J. Sunkel, "New Approach to Attitude/Momentum Control for the Space Station", Journal of Guidance, Control and Dynamics, Vol. 12, No. 5, 1989.

W. Warren, B. Wie, D. Geller, "Periodic-Disturbance Accommodating Control of the Space Station for Asymptotic Momentum Management". Journal of Guidance, Control and Dynamics, Vol. 13, No. 6, 1990.

PAPERS AND PRESENTATIONS:

B. Bingham, D. Geller, "Preliminary Orbit Determination or Orbital Rendezvous Using Gauss' Method", AIAA/AAS Astrodynamics Specialists Conference, Mackinac Island, MI, August 2007

S. Jenkins, D. Geller, "A Performance Comparison of Navigation and Targeting Algorithms for Orbital Rendezvous and Proximity Operations", AIAA/AAS Astrodynamics Specialists Conference, Mackinac Island, MI, August 2007

D. Woffinden, D. Geller, "Observability Criteria for Angles-Only Navigation", AIAA/AAS Astrodynamics Specialists Conference, Mackinac Island, MI, August 2007

D. Woffinden, D. Geller, "Navigating the Road to Autonomous Orbital Rendezvous", AIAA/AAS Astrodynamics Specialists Conference, Mackinac Island, MI, August 2007

D. Geller, "Linear Covariance Analysis for Lunar Powered Descent and Landing", AAS Guidance and Control Conference, Breckenridge, CO, February, 2007

D. Geller, "A Brief Study of Ground Controlled Orbital Rendezvous: When is Autonomy Required?", AIAA/AAS GN&C Conference, Keystone, CO, August 2006

D. Woffinden, D. Geller, "Relative Angles-Only Navigation and Pose Estimation For Autonomous Orbital Rendezvous", AIAA/AAS GN&C Conference, Keystone, CO, August 2006

N. Stastny, D. Geller, "Autonomous Optical Navigation at Jupiter: A Linear Covariance Analysis", AIAA/AAS GN&C Conference, Keystone, CO, August 2006

D. Geller, "Analysis of the Relative Attitude Estimation and Control Problem for Satellite Inspection and orbital Rendezvous", AAS Guidance and Control Conference, Breckenridge, February 2006

D. Geller, "Linear Covariance Techniques for Orbital Rendezvous Analysis and Autonomous Onboard Mission Planning", AIAA Guidance, Navigation, and Control Conference, San Francisco, August 2005

D. Geller, A. Vaughan, "An Analysis Plan for the Mars Telecommunications Orbiter Rendezvous and Autonomous Navigation Flight Experiment", AAS 05-214, presented at the AAS/AIAA Space Flight Mechanics Conference, Copper Mountain, CO, 2005.

D. Woffinden, D. Geller, T. Mosher, J. Kwong “On-Orbit Satellite Rendezvous Inspection”, presented at the AAS/AIAA Space Flight Mechanics Conference, Copper Mountain, CO, 2005.

T. Brand, L. Fuhrman, D. Geller, P. Hattis, S. Paschall, Y. C. Tao, “GN&C Technology Needed to Achieve Pinpoint Landing Accuracy at Mars”. Paper presented at the 2004 AIAA GN&C Conference, Providence, RI, August 2004.

J. E. Riedel, J. Guinn, M. Delpech, J. B., Dubois, D. Geller, P. Kachmar, “A Combined Open—Loop and Autonomous Search and Rendezvous Navigation System for the CNES/NASA Mars Premier Orbiter”, AAS 03-012 presented at the 26th Annual AAS Guidance and Control Conference, Breckenridge Co, February, 2003.

R. J. Chari, D. K. Geller, H. L. Norris, C. N. D’Souza, T. J. Brand, “Autonomous Orbital Rendezvous Using Angles-Only Navigation”. AAS 01-479 presented at the 2001 AAS/AIAA Astrodynamics Conference, Quebec City, Canada, August 2001.

G. Carman, D. Ives, D. Geller, “Apollo-Derived Mars Precision Lander Guidance”. AIAA 98-4570 presented at the AIAA Atmospheric Flight Mechanics Conference, Boston, August, 1998.

D. Geller, J. Weisheit, “Classical Electron-Ion Scattering in Strongly Magnetized Plasmas”., Presented at the AIP Atomic Processes in Plasmas Conference, San Francisco, January, 1996

AWARDS AND FELLOWSHIPS:

2007	Outstanding Teacher Award, Utah State University
1997	The Rice University William F. Marlar Outstanding Scholar Award
1996	NASA/Texas Space Grant Consortium Fellowship
1996	Outstanding Student Paper/Poster Award, AIP Atomic Processes in Plasmas Conference, San Francisco
1993-1997	Rice University Fellowship
1987-1992	4 NASA/Johnson Space Center Outstanding Performance Awards