Relative Spacecraft Dynamics Research
at the Air Force Research Laboratory

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Abstract
This presentation summarizes research and technology development in satellite guidance, navigation, and control in the Space Vehicles Directorate of the Air Force Research Laboratory (AFRL). The emphasis will be on applications involving relative motion between two or more space objects. These applications include guidance/maneuver planning and relative navigation for close proximity missions (e.g. cluster/formation flying or rendezvous and proximity operations), as well as rapid orbit determination of space objects from space-based sensors. Dr. Lovell will particularly discuss ongoing research involving students and faculty.

Dr. Thomas Alan Lovell is a Research Aerospace Engineer in the Spacecraft Component Technology Branch within the Space Vehicles Directorate of the U.S. Air Force Research Laboratory located at Kirtland Air Force Base in New Mexico. He received his B.S. from Georgia Tech in 1991, his M.S. from Arizona State University in 1994, and his Ph.D. from Auburn University in 2001; all three degrees are in Aerospace Engineering. He has authored or co-authored over 60 conference papers and a dozen journal articles on Astrodynamics and Spacecraft Guidance, Navigation, and Control. He recently contributed to the 3rd edition of the book Fundamentals of Astrodynamics by David Vallado. He is a Senior Member of AIAA and AAS, serves on the AIAA Astrodynamics Technical Committee, and has recently been nominated for AIAA Associate Fellow. He is also an Associate Editor for the AIAA Journal of Guidance, Control, and Dynamics. His research interests include astrodynamics, orbit determination, trajectory optimization, and feedback control design. He has been involved in the AFRL Scholars Summer Internship Program as a mentor since 2002, and served as Director from 2007-2009. He has also served as a mentor in the ASEE Summer Faculty Fellowship Program and the NRC Research Associate Program since 2010.