



## Résumé: Daniel R. Adamo

workshop final report co-author (reference

<http://www.lpi.usra.edu/sbag/documents/NEOfinalReport.pdf>).

- Supported NASA-Exploration Systems Mission Directorate's *Blue Sky* workshop on near-Earth object (NEO) exploration held October 2010.
- Under contract to NASA-JSC in 2010, performed space mission trajectory targeting and performance research primarily relating to human and robotic exploration of NEOs.
- At the 2010 International Space Development Conference, supported a 3-hour multi-media presentation of a human mission concept targeting the martian moon Deimos (reference <http://www.youtube.com/watch?v=X10GAqA4Ky4>).
- Supported development of a Flexible Path option for space exploration beyond Earth orbit by the Review of U.S. Human Space Flight Plans Committee in 2009.
- Proposed Lunar Surface Rendezvous exploration architecture to NASA based on two Ares V heavy-lift launches.
- Designed precision round-trip trajectories between Earth and near-Earth asteroids in support of NASA's Constellation Program.
- Served as space mission planning mentor to high school and college students.
- Designed, implemented, tested, published user documentation, and copyrighted orbit prediction, trajectory targeting, and Space Shuttle launch simulation software.
- Commercially distributed software and provided continuous Internet-based support. Users included NASA, NRL, ham radio operators, and educators and space enthusiasts worldwide.
- Provided customized trajectory designs for schools simulating missions in space.
- Fulfilled software development and delivery requirements under contract to NASA-GSFC in 1988 and NASA-JSC in 1992.
- United Space Alliance (August 1986 to August 2008) 600 Gemini Blvd., Houston, Texas 77058
  - Starting in 1989, obtained 4 NASA Mission Control Center (MCC) certifications as a "front room" flight controller. Supported 60 Space Shuttle missions under these certifications; 10 in a lead or co-lead capacity for the trajectory discipline. Regularly participated in trajectory design, software tool, flight rule, and operations concept development, together with contingency analyses and MCC data reconfiguration.
  - Served as a primary trajectory expert in establishing joint conventions and operational procedures with counterparts in MCC-Moscow during Shuttle-Mir and International Space Station operations.
  - Beginning in 1990, functioned as editor and a major contributing author of a 1000-page integrated text-and-graphics handbook documenting Mission Control trajectory operations and associated console procedures.
  - Served as astrodynamics mentor to new trainees, conducting dozens of seminars and simulations in coordinate transformations, orbit prediction, rigid

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- body motion, contingency rendezvous recovery, and deep space trajectory design.
- Coordinated and served as guide on dozens of NASA-JSC facility tours by the general public, schools, and official NASA visitors.
  - Functioned as technical lead and project manager for Space Shuttle crew-operated PC-based trajectory software development, documentation, flight crew training, and program integration through 1988.
  - The Singer Company, Link Flight Simulation Division (March 1979 to August 1986) 2222 Bay Area Blvd., Houston, Texas 77058
    - Designed, coded, certified, documented, and operated real time equations-of-motion applications software for Space Shuttle flight crew and Mission Control console operator training on the Shuttle Mission Simulator (SMS).
    - Developed, documented, and executed software tools and procedures for SMS reconfiguration to a desired trajectory state within minutes of its specification.
  - The Perkin-Elmer Corporation, Electro-Optical Division (July 1975 to February 1979) 77 Danbury Rd., Wilton, Connecticut 06897
    - Developed and operated proof-of-concept software for computer controlled polishing of optical elements from 30" to 100" aperture.
    - Designed, fabricated, and tested optical thin film multi-layers for thermal control, HEAO-B X-ray telescope mirrors, and Space Telescope prototypes.

### **Education:**

- MS Physical Sciences - University of Houston / Clear Lake City (1981)
- BS Optical Engineering - University of Rochester, Rochester, NY (1975)
- High School - Exeter High School, Exeter, NH 03833 (1971)

### **Publications:**

- "A Class Of Selenocentric Retrograde Orbits With Innovative Applications To Human Lunar Operations", AIAA/AAS Astrodynamics Specialist Conference, 2014.
- "*Aquarius*, A Reusable Water-Based Interplanetary Human Spaceflight Transport", personal publication, 2014.
- "Potentially Hazardous Object (PHO) 2013 TV<sub>135</sub>", personal publication, 2013.
- "Selenocentric Distant Retrograde Orbit Stability Assessments", personal publication, 2013.
- "Trajectory Challenges Faced By Reusable Infrastructure In Earth Orbit Supporting Multiple Departures For Mars", personal publication, 2013.
- "Chelyabinsk Bolide Trajectory Reconstruction", personal publication, 2013.
- "The 'Horseshoe' Orbit Of Near-Earth Object 2013 BS<sub>45</sub>", personal publication, 2013.
- "The Near-Earth Object Human Space Flight Accessible Targets Study: An Ongoing Effort to Identify Near-Earth Asteroid Destinations for Human Explorers, Planetary Defense Conference, 2013.
- "A Notional Round Trip To The Translunar Libration Point (EML2)", personal publication, 2012.

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- "Earth Departure Trajectory Reconstruction of Apollo Program Components Undergoing Disposal in Interplanetary Space", report delivered in fulfillment of a consulting agreement with JPL's Solar System Dynamics Group, 2012.
- "Interplanetary Human Habitat Passive Radiation Shielding Mass", spacecraft design reference donated to NASA-JSC's High School Aerospace Scholars educational outreach program, 2011.
- "Interplanetary Cruising", trajectory design reference donated to NASA-JSC's High School Aerospace Scholars educational outreach program, 2011.
- "A Simplified, Low Risk Strategy for the Exploration of Near-Earth Objects", 62nd International Astronautical Congress, 2011.
- "Why Atens Enjoy Enhanced Accessibility For Human Space Flight", AAS/AIAA Astrodynamics Specialist Conference, 2011.
- "Asteroid Destinations Accessible For Human Exploration: A Preliminary Survey In Mid-2009", *AIAA Journal of Spacecraft and Rockets*, Vol. 47, No. 6, 2010.
- "Scientific Exploration of Near-Earth Objects Via the Orion Crew Exploration Vehicle", *Meteoritics & Planetary Science*, Vol. 44, No. 12, 2009.
- "The Elusive Human Maximum Altitude Record", *Quest: The History of Spaceflight Quarterly*, Vol. 16, No. 4, 2009.
- "Piloted Missions at a Near Earth Object (NEO)", *Acta Astronautica*, Vol. 65, 2009.
- "A Notional Lunar Surface Rendezvous Mission In 2019", personal publication, 2009.
- "Revisited Virtues of Lunar Surface Rendezvous (LSR)", posted by Review of U.S. Human Space Flight Plans Committee to [http://www.nasa.gov/pdf/373994main\\_036%20-%2020090608.17.LSRvirtuesR6.pdf](http://www.nasa.gov/pdf/373994main_036%20-%2020090608.17.LSRvirtuesR6.pdf), 2009.
- "Apollo 13 Trajectory Reconstruction Via State Transition Matrices", *AIAA Journal of Guidance, Navigation, and Control*, Vol. 31, No. 6, 2008.
- "A 2-Stage Earth Return Targeting Strategy From Polar Low Lunar Orbit", personal publication, 2008.
- "Science Opportunities Enabled by NASA's Constellation Systems: Exploration of Near-Earth Objects via the Crew Exploration Vehicle", presented to the National Research Counsel, 2008.
- "A Translunar Targeting Demonstration", personal publication, 2007.
- "A Lunar Mission Architecture Proposal With EML1 Infrastructure", personal publication, 2007.
- "ISS Rendezvous Phasing Considerations Pertaining To Optimal STS-114/LF1 Launch Opportunities", AIAA Guidance, Navigation, and Control Conference and Exhibit, 2005.
- "A Meaningful Relative Motion Coordinate System For Generic Use", AAS/AIAA Astrodynamics Specialist Conference, 2005.
- "A Precision Orbit Predictor Optimized For Complex Trajectory Operations", AAS/AIAA Astrodynamics Specialist Conference, 2003.
- "Accelerated Stumpff Function Evaluations Associated With Universal Kepler's Equation Solutions", AAS/AIAA Astrodynamics Specialist Conference, 2001.
- "Contingency ISS Rendezvous Recovery Planning by Houston and Moscow Control Centers", AAS/AIAA Astrodynamics Specialist Conference, 1999.

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- "User's Guide to MacMECO v1.0", personal publication, 1998.
- "STS-88 Joint Underspeed Recovery (JURe) Capability White Paper", NASA-JSC publication, 1998.
- "Evaluation of J2-Perturbed Apsis Height Computation Methods", AAS/AIAA Astrodynamics Specialist Conference, 1997.
- "User's Guide to MacSPOC v1.5", personal publication, 1993.
- "User's Guide to MacMission Control v3.2", personal publication, 1989.
- "Transformation of NORAD Elements to an M50 State Vector", personal publication, 1987.
- "User's Guide to the FZ SMS Initialization Subsystem", NASA-JSC publication, 1986.
- "A Study of SMS Target RCS Plume Impingement Models", NASA-JSC publication, 1984.
- "A Uniform Solution of the Lambert Problem Derived from Sperling's Equation", masters degree thesis, 1981.
- "Optical Coating Techniques for Wolter-Type Substrates", *Proceedings of the Society of Photo-Optical Instrumentation Engineers*, Vol. 184, 1979.

### Awards And Certifications:

- *U.S. Human Space Flight Plans Committee* NASA Group Achievement Award (2009)
- *Constellation Enabled Mission: NEO* NASA Group Achievement Award (2008)
- *STS-120/10A Prelaunch Conjunction Screening Team* NASA-JSC Group Achievement Award (2008)
- *STS-117/13A Trajectory Team* NASA-JSC Group Achievement Award (2007)
- *STS-116/12A.1 Pre-Launch Trajectory Analysis Team* NASA-JSC Group Achievement Award (2007)
- *STS-121/ULF 1.1 Flight Dynamics and International Space Station Trajectory Operations Team* NASA-JSC Group Achievement Award (2006)
- MacHILT v0.5 Copyright Registration (2006)
- United Space Alliance Quest Performance Award (2006)
- *STS-114 Launch and Rendezvous Phasing Team* NASA-JSC Group Achievement Award (2005)
- *WeavEncke Orbit Predictor* NASA Tech Brief Publication Certificate of Recognition (2005)
- United Space Alliance Quest Performance Award (2005)
- United Space Alliance Quest Performance Award (2002)
- *STS-101/2A.2a Flight Dynamics Team* NASA-JSC Group Achievement Award (2000)
- STS-101/2A.2a Flight Director Office Hang The Plaque Award (2000)
- Silver Snoopy Astronauts' Personal Achievement Award (2000)
- *STS-88/2A Flight Design and Ballistics Team* NASA-JSC Group Achievement Award (1999)
- Phase 1 Program Team NASA Group Achievement Award (1998)
- *Phase 1 Ascent Flight Dynamics Officers and Rendezvous Flight Dynamics Officers* NASA-JSC Group Achievement Award (1998)

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- MacMECO v1.0 Copyright Registration (1998)
- *STS-80 Multi-Spacecraft Motion Flight Dynamics and Design Team* NASA-JSC Group Achievement Award (1997)
- *STS-72 Rendezvous and Prox Ops Design Team* NASA-JSC Group Achievement Award (1996)
- MCC Rendezvous Flight Dynamics Officer Certification (1993)
- MacSPOC v1.3 Copyright Registration (1992)
- *STS-40 Spacelab Life Sciences-1* NASA-JSC Group Achievement Award (1992)
- MCC Deploy Flight Dynamics Officer Certification (1991)
- MCC Orbit Flight Dynamics Officer Certification (1991)
- MCC Orbit Trajectory Officer Certification (1990)
- MacMission Control v3.2 Copyright Registration (1989)

### **Miscellaneous:**

- Citizenship - USA
- Security Clearance - None
- Member of AIAA since 1983
- Other Interests - Astronomy, Photography, Wine Tasting