

# 2005 *Journal of Spacecraft and Rockets* Index

## How to Use the Index

In the Subject Index, pages 1138–1143, each technical paper is listed under a maximum of three appropriate headings. Note the locating number in boldface type preceding each paper title, and use that number to find the paper in the Chronological Index. The Author Index, pages 1144–1145, lists all authors associated with a given technical paper. The locating numbers are identical to those in the Subject Index. The Chronological Index, pages 1146–1151, also lists all papers by their locating numbers. This listing contains titles, authors and their affiliations, and volume, issue number, and page where the paper appeared. It also gives the AIAA paper number, if any, on which the article was based.

## Subject Index

### AIRCRAFT TECHNOLOGY, CONVENTIONAL, STOL/VTOL

#### *Aerodynamics*

**A05-029** Navier–Stokes Computations for a Spinning Projectile from Subsonic to Supersonic Speeds

**A05-030** Aerodynamic Performances of Lifting-Body Configurations for a Reentry Vehicle

**A05-003** Aerodynamics of Low-Blowing-Ratio Fuselage Injection into a Supersonic Freestream

**A05-031** 2005 Version of the Aeroprediction Code (AP05)

**A05-023** Effect of Kinetic Energy Projectile Inertia upon Precision

**A05-074** Construction of a Unified Continuum/Kinetic Solver for Aerodynamic Problems

**A05-055** Modeling Reaction-Control-System Effects on Mars Odyssey

**A05-108** Prediction of the Pitch-Damping Coefficients Using Sacks's Relations

#### *Aerospace Plane*

**A05-027** Aerothermodynamic Environments and Thermal Protection for a Wave-Rider Second Stage

**A05-006** Laser-Supported Directed-Energy "Air Spike" in Hypersonic Flow

#### *Configuration Design*

**A05-081** Airframe-Propulsion Integration Methodology for Waverider-Derived Hypersonic Cruise Aircraft Design Concepts

#### *Military Missions*

**A05-060** Orbital Debris Effects from Space-Based Ballistic Missile Interception

#### *Noise*

**A05-078** Fairing Noise Control Using Tube-Shaped Resonators

#### *Powerplant Integration*

**A05-081** Airframe-Propulsion Integration Methodology for Waverider-Derived Hypersonic Cruise Aircraft Design Concepts

#### *Testing, Flight and Ground*

**A05-097** Hypersonic Experimental Facility for Magnetoaerodynamic Interactions

#### *Vibration*

**A05-045** Multiple Sensors and Actuators for Vibration Suppression of an Inflated Torus

### COMPUTING, INFORMATION, AND COMMUNICATION

#### *Autonomous Systems*

**A05-142** Angular Rate Estimation Using Fixed and Vibrating Triaxial Acceleration Measurements

### ENERGY

#### *Laser Integration/Systems*

**A05-062** Cold-Flow Testing of Subscale Model Exhaust System for Space-Based Laser

#### *Photovoltaic Power*

**A05-119** Degradation of High-Voltage Solar Array Due to Arcing in Plasma Environment

**A05-091** Number of Arcs Estimated on Solar Array of a Geostationary Satellite

**A05-137** Development, Design, and Testing of PowerSphere Multifunctional Ultraviolet-Rigidizable Inflatable Structures

**A05-089** Operational Workarounds for the Space Station Beta Gimbal Anomaly

**A05-067** Solar Arrays for Direct-Drive Electric Propulsion: Arcing at High Voltages

#### *Solar Power*

**A05-020** Electrical Performance from Bifacial Illumination International Space Station Photovoltaic Array

### FLIGHT SIMULATOR SYSTEMS

#### *Intelligent Systems*

**A05-142** Angular Rate Estimation Using Fixed and Vibrating Triaxial Acceleration Measurements

### FLUID DYNAMICS

#### *Aeroacoustics*

**A05-013** Numerical Simulation of Aeroacoustic Phenomena in a Solid Rocket Booster

#### *Boundary Layers and Heat Transfer-Laminar*

**A05-025** Nonequilibrium Viscous Shock-Layer Heat Transfer with Arbitrary Surface Catalyticity

#### *Boundary Layers and Heat Transfer-Turbulent*

**A05-072** Control of Hypersonic Turbulent Skin Friction by Boundary-Layer Combustion of Hydrogen

#### *Boundary-Layer Stability and Transition*

**A05-125** Hypersonic Shear Layer Stability Experiments

**A05-058** Rapid Engineering Approach to Modeling Hypersonic Laminar-To-Turbulent Transitional Flows

**A05-009** Streamwise Vortex Instability and Transition on the Hyper-2000 Scramjet Forebody

### **Computational Fluid Dynamics**

**A05-029** Navier–Stokes Computations for a Spinning Projectile from Subsonic to Supersonic Speeds

**A05-036** Self-Pressurization of Large Spherical Cryogenic Tanks in Space

**A05-033** Numerical Study of Turbulent Flows over Launch Vehicle Configurations

**A05-058** Rapid Engineering Approach to Modeling Hypersonic Laminar-To-Turbulent Transitional Flows

**A05-071** Numerical Simulation of Compressible Separated Turbulent Flows over Inclined Slender Body

**A05-098** Stabilization of Blunt Nose Cavity Flows by Using Energy Deposition

**A05-101** Direct Simulation Monte Carlo Investigation of Hyperthermal Oxygen Beam Exposures

### **Hypersonic Flow**

**A05-125** Hypersonic Shear Layer Stability Experiments

**A05-027** Aerothermodynamic Environments and Thermal Protection for a Wave-Rider Second Stage

**A05-097** Hypersonic Experimental Facility for Magnetoaerodynamic Interactions

**A05-058** Rapid Engineering Approach to Modeling Hypersonic Laminar-To-Turbulent Transitional Flows

**A05-002** Flat-Faced Leading-Edge Effects in Low-Density Hypersonic Wedge Flow

**A05-073** Aerothermodynamic Performance Analysis of Hypersonic Flow on Power Law Leading Edges

**A05-096** Fluid Structure Interaction on a Generic Body-Flap Model in Hypersonic Flow

**A05-028** Calculation of Shock Wave Structure over Power Law Bodies in Hypersonic Flow

**A05-005** Analysis of Magnetoplasmadynamic Interaction in the Boundary Layer of a Hypersonic Vehicle

**A05-001** Stationary Coupling of Hypersonic Nonequilibrium Flows and Thermal-Protection-System Structure

**A05-006** Laser-Supported Directed-Energy “Air Spike” in Hypersonic Flow

### **Inlet, Nozzle, Diffuser, and Channel Flows**

**A05-062** Cold-Flow Testing of Subscale Model Exhaust System for Space-Based Laser

### **Jets, Wakes, and Viscid-Inviscid Flow Interactions**

**A05-004** Jet Interaction in Supersonic Flow with a Downstream Surface Ramp

**A05-128** Sub-Boundary-Layer Disturbance Effects on Supersonic Base-Pressure Fluctuations

### **Plasmadynamics and MHD**

**A05-005** Analysis of Magnetoplasmadynamic Interaction in the Boundary Layer of a Hypersonic Vehicle

**A05-006** Laser-Supported Directed-Energy “Air Spike” in Hypersonic Flow

**A05-097** Hypersonic Experimental Facility for Magnetoaerodynamic Interactions

### **Rarefied Flows**

**A05-074** Construction of a Unified Continuum/Kinetic Solver for Aerodynamic Problems

**A05-125** Hypersonic Shear Layer Stability Experiments

**A05-101** Direct Simulation Monte Carlo Investigation of Hyperthermal Oxygen Beam Exposures

**A05-056** Plume Modeling and Application to Mars 2001 Odyssey Aerobraking

**A05-028** Calculation of Shock Wave Structure over Power Law Bodies in Hypersonic Flow

**A05-084** Trajectory and Attitude Simulation for Aerocapture and Aerobraking

**A05-073** Aerothermodynamic Performance Analysis of Hypersonic Flow on Power Law Leading Edges

**A05-002** Flat-Faced Leading-Edge Effects in Low-Density Hypersonic Wedge Flow

### **Reacting Flows and Combustion**

**A05-025** Nonequilibrium Viscous Shock-Layer Heat Transfer with Arbitrary Surface Catalyticity

### **Separated Flows**

**A05-071** Numerical Simulation of Compressible Separated Turbulent Flows over Inclined Slender Body

**A05-128** Sub-Boundary-Layer Disturbance Effects on Supersonic Base-Pressure Fluctuations

### **Shock Waves and Detonations**

**A05-004** Jet Interaction in Supersonic Flow with a Downstream Surface Ramp

### **Supersonic Flow**

**A05-003** Aerodynamics of Low-Blowing-Ratio Fuselage Injection into a Supersonic Freestream

**A05-030** Aerodynamic Performances of Lifting-Body Configurations for a Reentry Vehicle

**A05-098** Stabilization of Blunt Nose Cavity Flows by Using Energy Deposition

**A05-128** Sub-Boundary-Layer Disturbance Effects on Supersonic Base-Pressure Fluctuations

### **Transonic Flow**

**A05-030** Aerodynamic Performances of Lifting-Body Configurations for a Reentry Vehicle

**A05-033** Numerical Study of Turbulent Flows over Launch Vehicle Configurations

### **Unsteady Flows**

**A05-098** Stabilization of Blunt Nose Cavity Flows by Using Energy Deposition

### **Vortices**

**A05-048** Vane-Type Suppressor to Prevent Vortexing During Draining from Cylindrical Tanks

## **GUIDANCE, CONTROL, AND DYNAMICS TECHNOLOGY**

### **Astrodynamics**

**A05-114** Optimal Invariant Spacecraft Formation Deployment with Collision Risk Management

**A05-055** Modeling Reaction-Control-System Effects on Mars Odyssey

**A05-050** 2001 Mars Odyssey Orbit Determination During Interplanetary Cruise

**A05-115** Powered Earth-Mars Cyclers with Three-Synodic-Period Repeat Time

**A05-135** Orbital Evolution of Cloud Particles from Explosions of Geosynchronous Objects

**A05-120** Near-Optimal Solar-Sail Orbit-Raising from Low Earth Orbit

**A05-022** Generalized Model for Solar Sails

**A05-085** Toward a Standard Nomenclature for Earth-Mars Cyclers Trajectories

**A05-064** Method for Parking-Orbit Reorientation for Human Missions to Mars

**A05-038** Orbit Transfer via Tube Jumping in Planar Restricted Problems of Four Bodies

**A05-110** Artificial Gravity and Abort Scenarios via Tethers for Human Missions to Mars

**A05-083** Guidance Strategy for Radially Accelerated Trajectories

**A05-141** Optimal Control Laws for Axially Symmetric Solar Sails

### **Control System Design**

**A05-018** Robust Control for Microgravity Vibration Isolation System

**A05-090** Design and Testing of a Control Moment Gyroscope Cluster for Small Satellites

### **Control System Effectors**

**A05-126** Aerodynamic Yaw Controller for the Space Shuttle Orbiter

### **Dynamics**

**A05-103** Improved Method of Mixed-Boundary Component-Mode Representation for Structural Dynamic Analysis

**A05-065** Multibody Dynamics Modeling of Segmented Booms of the Mars Express Spacecraft

**A05-066** Nutation Time Constant Determination of On-Axis Diaphragm Tanks on Spinner Spacecraft

### **Flight Mechanics**

**A05-083** Guidance Strategy for Radially Accelerated Trajectories

**A05-082** Flight Reconstruction of the Mars Pathfinder Disk-Gap-Band Parachute Drag Coefficients

**A05-023** Effect of Kinetic Energy Projectile Inertia upon Precision

**A05-053** Development and Evaluation of an Operational Aerobraking Strategy for Mars Odyssey

**A05-051** 2001 Mars Odyssey Aerobraking

### **Launch Vehicle Dynamics**

**A05-078** Fairing Noise Control Using Tube-Shaped Resonators

**A05-080** Dynamic Design of Octostrut Platform for Launch Stage Whole-Spacecraft Vibration Isolation

### **Launch Vehicle Guidance and Control**

**A05-010** Optimal Design of Two-Stage-To-Orbit Space Planes with Airbreathing Engines

### **Missile Dynamics**

**A05-023** Effect of Kinetic Energy Projectile Inertia upon Precision

**A05-109** Lateral Motion of Free-Rolling Tail Rockets in Free Flight

**A05-060** Orbital Debris Effects from Space-Based Ballistic Missile Interception

### **Navigation**

**A05-038** Orbit Transfer via Tube Jumping in Planar Restricted Problems of Four Bodies

**A05-050** 2001 Mars Odyssey Orbit Determination During Interplanetary Cruise

**A05-022** Generalized Model for Solar Sails

**A05-069** Estimating Parameterized Post-Newtonian Parameters from Spacecraft Radiometric Tracking Data

**A05-049** Mars Odyssey Navigation Experience

### **Optimization Techniques**

**A05-082** Flight Reconstruction of the Mars Pathfinder Disk-Gap-Band Parachute Drag Coefficients

**A05-086** Optimization of a Tetrahedral Satellite Formation

### **Pointing Systems**

**A05-090** Design and Testing of a Control Moment Gyroscope Cluster for Small Satellites

### **Redundancy Management**

**A05-040** Restoring Redundancy to the Wilkinson Microwave Anisotropy Probe Propulsion System

### **Spacecraft Dynamics**

**A05-066** Nutation Time Constant Determination of On-Axis Diaphragm Tanks on Spinner Spacecraft

**A05-065** Multibody Dynamics Modeling of Segmented Booms of the Mars Express Spacecraft

**A05-090** Design and Testing of a Control Moment Gyroscope Cluster for Small Satellites

**A05-060** Orbital Debris Effects from Space-Based Ballistic Missile Interception

**A05-034** Stability of Flexible Spacecraft During a Shallow Aeroassist

**A05-080** Dynamic Design of Octostrut Platform for Launch Stage Whole-Spacecraft Vibration Isolation

**A05-112** Orbit Determination Strategy Using Single-Frequency Global-Positioning-System Data

**A05-046** Dynamics of Rotating Linear Array Tethered Satellite System

### **Spacecraft Guidance and Control**

**A05-132** Spacecraft Rendezvous on Small Relative Inclination Orbits Using Tethers

**A05-052** Aerodynamic Safing Approach for the 2001 Mars Odyssey Spacecraft During Aerobraking

**A05-126** Aerodynamic Yaw Controller for the Space Shuttle Orbiter

**A05-047** Time-Optimal Three-Dimensional Trajectories for Solar Photon Thruster Spacecraft

**A05-015** Ionospheric Instability Observed in Low Earth Orbit Using Global Positioning System

**A05-016** Preliminary Design of Earth-Mars Cyclers Using Solar Sails

**A05-066** Nutation Time Constant Determination of On-Axis Diaphragm Tanks on Spinner Spacecraft

**A05-040** Restoring Redundancy to the Wilkinson Microwave Anisotropy Probe Propulsion System

**A05-083** Guidance Strategy for Radially Accelerated Trajectories

**A05-129** Closed-Loop Trajectory Simulation for Thermal Protection System Design for Neptune Aerocapture

### **State Estimation**

**A05-007** Spin Axis Attitude Estimation by a Controlled Correlation Method

**A05-069** Estimating Parameterized Post-Newtonian Parameters from Spacecraft Radiometric Tracking Data

**A05-118** Uncertainty Analysis of Propellant Gauging System for Spacecraft

**A05-050** 2001 Mars Odyssey Orbit Determination During Interplanetary Cruise

### **Structural Control**

**A05-045** Multiple Sensors and Actuators for Vibration Suppression of an Inflated Torus

**A05-018** Robust Control for Microgravity Vibration Isolation System

### **System Identification**

**A05-008** Dynamic Model Establishment of a Deployable Missile Control Fin with Nonlinear Hinge

### **Trajectory Optimization**

**A05-016** Preliminary Design of Earth-Mars Cyclers Using Solar Sails

**A05-063** Trajectory and System Analysis For Outer-Planet Solar Electric Propulsion Missions

**A05-017** Geometric Analysis of Free-Return Trajectories Following a Gravity-Assisted Flyby

**A05-047** Time-Optimal Three-Dimensional Trajectories for Solar Photon Thruster Spacecraft

**A05-120** Near-Optimal Solar-Sail Orbit-Raising from Low Earth Orbit

**A05-132** Spacecraft Rendezvous on Small Relative Inclination Orbits Using Tethers

**A05-114** Optimal Invariant Spacecraft Formation Deployment with Collision Risk Management

**A05-129** Closed-Loop Trajectory Simulation for Thermal Protection System Design for Neptune Aerocapture

**A05-141** Optimal Control Laws for Axially Symmetric Solar Sails

**A05-131** Trajectory Analysis and Staging Trades for Smaller Mars Ascent Vehicles

## **INTERDISCIPLINARY TOPICS**

### **Analytical and Numerical Methods**

**A05-074** Construction of a Unified Continuum/Kinetic Solver for Aerodynamic Problems

**A05-024** Nonfree Space Radiating Fin Optimum Dimension and Efficiency Correlations

**A05-082** Flight Reconstruction of the Mars Pathfinder Disk-Gap-Band Parachute Drag Coefficients

**A05-093** Integrating System-Level and Component-Level Designs Under Uncertainty

### **Atmospheric and Space Sciences**

**A05-087** Lidar Backscatter Properties of  $\text{Al}_2\text{O}_3$  Rocket Exhaust Particles

**A05-133** Correlation of Double Star Anomalies with Space Environment

### **Environmental Effects**

**A05-136** Toolkit for Updating Interplanetary Proton Cumulated Fluence Models

**A05-107** Using NASA Standard Breakup Model to Describe Low-Velocity Impacts on Spacecraft

**A05-039** Secondary Discharges on Solar Arrays: Vacuum Arcs Across Adjacent Biased Cells

**A05-091** Number of Arcs Estimated on Solar Array of a Geostationary Satellite

**A05-015** Ionospheric Instability Observed in Low Earth Orbit Using Global Positioning System

**A05-133** Correlation of Double Star Anomalies with Space Environment

### **Lasers and Laser Applications**

**A05-062** Cold-Flow Testing of Subscale Model Exhaust System for Space-Based Laser

### **Multidisciplinary Design Optimization**

**A05-048** Vane-Type Suppressor to Prevent Vortexing During Draining from Cylindrical Tanks

**A05-010** Optimal Design of Two-Stage-To-Orbit Space Planes with Airbreathing Engines

**A05-093** Integrating System-Level and Component-Level Designs Under Uncertainty

**A05-017** Geometric Analysis of Free-Return Trajectories Following a Gravity-Assisted Flyby

### **Reliability, Maintainability, and Logistics Support**

**A05-093** Integrating System-Level and Component-Level Designs Under Uncertainty

**A05-140** Impact of Subsystem Reliability on Satellite Revenue Generation and Present Value

### **Sensor Systems**

**A05-138** Zero- and One-g Comparison of Surface Profile in Single-Curved Parabolic Membrane

## **LAUNCH VEHICLE AND MISSILE (LV/M) TECHNOLOGY**

### **Aerodynamics**

**A05-108** Prediction of the Pitch-Damping Coefficients Using Sacks's Relations

**A05-127** Effect of Intake Geometry on Longitudinal Aerodynamics of Airbreathing Vehicles

**A05-126** Aerodynamic Yaw Controller for the Space Shuttle Orbiter

**A05-031** 2005 Version of the Aeroprediction Code (AP05)

**A05-032** Aerodynamic Predictions, Comparisons, and Validations Using Missile DATCOM (97) and Aeroprediction 98 (AP98)

**A05-004** Jet Interaction in Supersonic Flow with a Downstream Surface Ramp

**A05-033** Numerical Study of Turbulent Flows over Launch Vehicle Configurations

### **Command and Information Systems**

**A05-044** Performance of Spread-Spectrum Communication for Satellite-Based Range Services

### **Configuration Design**

**A05-010** Optimal Design of Two-Stage-To-Orbit Space Planes with Airbreathing Engines

### **Launch Vehicle and Sounding Rocket Systems**

**A05-070** Air-Launching Earth to Orbit: Effects of Launch Conditions and Vehicle Aerodynamics

### **Missile Systems**

- A05-031** 2005 Version of the Aeroprediction Code (AP05)  
**A05-032** Aerodynamic Predictions, Comparisons, and Validations Using Missile DATCOM (97) and Aeroprediction 98 (AP98)

### **Propulsion and Propellant Systems**

- A05-048** Vane-Type Suppressor to Prevent Vortexing During Draining from Cylindrical Tanks  
**A05-116** Lessons Learned During Redesign of Shuttle Reaction Control Thruster Pilot Seat Assembly  
**A05-042** Molecular Dynamics from Remote Observation of CO(a) from Space Shuttle Plumes

### **Testing, Flight and Ground**

- A05-012** Nonlinear Dynamic Analysis to Extend the Value of Liquid Rocket Qualification Test  
**A05-099** Material Characterization of Shuttle Thermal Protection System for Impact Analyses

### **Thermal Protection Systems**

- A05-026** Simulation of Foam-Impact Effects on the Space Shuttle Thermal Protection System  
**A05-059** Transpiration Cooling Performance in LOX/Methane Liquid-Fuel Rocket Engines  
**A05-096** Fluid Structure Interaction on a Generic Body-Flap Model in Hypersonic Flow  
**A05-104** Thermal Buckling of Metal Foam Sandwich Panels for Convective Thermal Protection Systems

### **Trajectories and Tracking Systems**

- A05-112** Orbit Determination Strategy Using Single-Frequency Global-Positioning-System Data  
**A05-070** Air-Launching Earth to Orbit: Effects of Launch Conditions and Vehicle Aerodynamics

### **Vibration**

- A05-139** Pendulum Mode Control of Free-Free Launcher Structural Models in Gravity Fields  
**A05-117** Simplified Vibration Model of Solid-Rocket Motor Coupled with Solid Propellant  
**A05-080** Dynamic Design of Octostrut Platform for Launch Stage Whole-Spacecraft Vibration Isolation

## **PROPULSION**

### **Advanced Space Propulsion**

- A05-077** Fabrication and Operation of Micro-fabricated Emitters as Components for a Colloid Thruster  
**A05-022** Generalized Model for Solar Sails  
**A05-094** Discharge Frequency Modulation of Pulsed Plasma Thruster  
**A05-132** Spacecraft Rendezvous on Small Relative Inclination Orbits Using Tethers

### **Electric Propulsion**

- A05-019** Pulsed Plasma Thruster System for Microsatellites  
**A05-094** Discharge Frequency Modulation of Pulsed Plasma Thruster  
**A05-095** Engine-Switching Strategies for Interplanetary Solar-Electric-Propulsion Spacecraft  
**A05-077** Fabrication and Operation of Micro-fabricated Emitters as Components for a Colloid Thruster

- A05-068** Solar Arrays for Direct-Drive Electric Propulsion: Electron Collection at High Voltages  
**A05-067** Solar Arrays for Direct-Drive Electric Propulsion: Arcing at High Voltages

### **Engine Cooling and Heat Transfer**

- A05-059** Transpiration Cooling Performance in LOX/Methane Liquid-Fuel Rocket Engines

### **Engine Materials**

- A05-116** Lessons Learned During Redesign of Shuttle Reaction Control Thruster Pilot Seat Assembly

### **Engine Performance**

- A05-042** Molecular Dynamics from Remote Observation of CO(a) from Space Shuttle Plumes

### **Hypersonic Propulsion**

- A05-081** Airframe-Propulsion Integration Methodology for Waverider-Derived Hypersonic Cruise Aircraft Design Concepts

### **Liquid Rocket Engines**

- A05-012** Nonlinear Dynamic Analysis to Extend the Value of Liquid Rocket Qualification Test

### **Micro Propulsion and Power**

- A05-019** Pulsed Plasma Thruster System for Microsatellites  
**A05-094** Discharge Frequency Modulation of Pulsed Plasma Thruster

### **Solid Rocket Motors**

- A05-117** Simplified Vibration Model of Solid-Rocket Motor Coupled with Solid Propellant  
**A05-013** Numerical Simulation of Aeroacoustic Phenomena in a Solid Rocket Booster  
**A05-087** Lidar Backscatter Properties of Al<sub>2</sub>O<sub>3</sub> Rocket Exhaust Particles

### **Supersonic Combustion**

- A05-072** Control of Hypersonic Turbulent Skin Friction by Boundary-Layer Combustion of Hydrogen

## **REAL-TIME SYSTEMS**

### **Sensor Systems**

- A05-142** Angular Rate Estimation Using Fixed and Vibrating Triaxial Acceleration Measurements

## **SPACE TECHNOLOGY**

### **Aerobraking Configurations/ Aerothermodynamics**

- A05-052** Aerodynamic Safing Approach for the 2001 Mars Odyssey Spacecraft During Aerobraking  
**A05-056** Plume Modeling and Application to Mars 2001 Odyssey Aerobraking  
**A05-057** Aeroheating Thermal Model Correlation for Mars Global Surveyor Solar Array  
**A05-130** Parametric Study of Aerocapture for Missions to Venus

### **Aerobraking Flight Mechanics**

- A05-130** Parametric Study of Aerocapture for Missions to Venus

- A05-034** Stability of Flexible Spacecraft During a Shallow Aeroassist

- A05-084** Trajectory and Attitude Simulation for Aerocapture and Aerobraking

- A05-056** Plume Modeling and Application to Mars 2001 Odyssey Aerobraking

- A05-055** Modeling Reaction-Control-System Effects on Mars Odyssey

- A05-054** Application of Accelerometer Data to Mars Odyssey Aerobraking and Atmospheric Modeling

- A05-052** Aerodynamic Safing Approach for the 2001 Mars Odyssey Spacecraft During Aerobraking

- A05-051** 2001 Mars Odyssey Aerobraking

- A05-053** Development and Evaluation of an Operational Aerobraking Strategy for Mars Odyssey

- A05-049** Mars Odyssey Navigation Experience

### **Global Positioning System**

- A05-112** Orbit Determination Strategy Using Single-Frequency Global-Positioning-System Data

- A05-015** Ionospheric Instability Observed in Low Earth Orbit Using Global Positioning System

### **International Space Station**

- A05-020** Electrical Performance from Bifacial Illumination International Space Station Photovoltaic Array

- A05-089** Operational Workarounds for the Space Station Beta Gimbal Anomaly

### **Mission Design and Analysis**

- A05-110** Artificial Gravity and Abort Scenarios via Tethers for Human Missions to Mars

- A05-086** Optimization of a Tetrahedral Satellite Formation

- A05-014** Mission and Constellation Design for Low-Cost Weather Observation Satellites

- A05-130** Parametric Study of Aerocapture for Missions to Venus

- A05-063** Trajectory and System Analysis For Outer-Planet Solar Electric Propulsion Missions  
**A05-064** Method for Parking-Orbit Reorientation for Human Missions to Mars

- A05-038** Orbit Transfer via Tube Jumping in Planar Restricted Problems of Four Bodies

- A05-053** Development and Evaluation of an Operational Aerobraking Strategy for Mars Odyssey

- A05-051** 2001 Mars Odyssey Aerobraking

- A05-037** Cost-Benefit Analysis of the Aerocapture Mission Set

- A05-111** Trajectory Options for Manned Mars Missions

- A05-069** Estimating Parameterized Post-Newtonian Parameters from Spacecraft Radiometric Tracking Data

- A05-085** Toward a Standard Nomenclature for Earth-Mars Cycler Trajectories

- A05-095** Engine-Switching Strategies for Interplanetary Solar-Electric-Propulsion Spacecraft

- A05-115** Powered Earth-Mars Cycler with Three-Synodic-Period Repeat Time

- A05-113** Tundra Constellation Design and Stationkeeping

- A05-131** Trajectory Analysis and Staging Trades for Smaller Mars Ascent Vehicles

- A05-141** Optimal Control Laws for Axially Symmetric Solar Sails

### ***Mission Trajectories (Earth and Interplanetary)***

- A05-131** Trajectory Analysis and Staging Trades for Smaller Mars Ascent Vehicles  
**A05-049** Mars Odyssey Navigation Experience  
**A05-114** Optimal Invariant Spacecraft Formation Deployment with Collision Risk Management  
**A05-115** Powered Earth-Mars Cycler with Three-Synodic-Period Repeat Time  
**A05-070** Air-Launching Earth to Orbit: Effects of Launch Conditions and Vehicle Aerodynamics  
**A05-095** Engine-Switching Strategies for Interplanetary Solar-Electric-Propulsion Spacecraft  
**A05-120** Near-Optimal Solar-Sail Orbit-Raising from Low Earth Orbit  
**A05-085** Toward a Standard Nomenclature for Earth-Mars Cycler Trajectories  
**A05-111** Trajectory Options for Manned Mars Missions  
**A05-047** Time-Optimal Three-Dimensional Trajectories for Solar Photon Thruster Spacecraft  
**A05-064** Method for Parking-Orbit Reorientation for Human Missions to Mars  
**A05-063** Trajectory and System Analysis For Outer-Planet Solar Electric Propulsion Missions  
**A05-016** Preliminary Design of Earth-Mars Cyclers Using Solar Sails  
**A05-086** Optimization of a Tetrahedral Satellite Formation  
**A05-084** Trajectory and Attitude Simulation for Aerocapture and Aerobraking  
**A05-110** Artificial Gravity and Abort Scenarios via Tethers for Human Missions to Mars  
**A05-017** Geometric Analysis of Free-Return Trajectories Following a Gravity-Assisted Flyby

### ***Space Experiments***

- A05-042** Molecular Dynamics from Remote Observation of CO(a) from Space Shuttle Plumes  
**A05-018** Robust Control for Microgravity Vibration Isolation System

### ***Space Systems***

- A05-068** Solar Arrays for Direct-Drive Electric Propulsion: Electron Collection at High Voltages  
**A05-041** Low-Cost Cold-Gas Reaction Control System for the Slosat FLEVO Small Satellite  
**A05-014** Mission and Constellation Design for Low-Cost Weather Observation Satellites  
**A05-119** Degradation of High-Voltage Solar Array Due to Arcing in Plasma Environment  
**A05-140** Impact of Subsystem Reliability on Satellite Revenue Generation and Present Value  
**A05-046** Dynamics of Rotating Linear Array Tethered Satellite System

### ***Spacecraft Attitude Determination***

- A05-007** Spin Axis Attitude Estimation by a Controlled Correlation Method

### ***Spacecraft Communication***

- A05-044** Performance of Spread-Spectrum Communication for Satellite-Based Range Services  
**A05-140** Impact of Subsystem Reliability on Satellite Revenue Generation and Present Value

### ***Spacecraft Contamination/Sterilization***

- A05-021** Changes in the Optical Properties of Simulated Shuttle Waste Water Deposits: Urine Darkening

### ***Spacecraft Power***

- A05-119** Degradation of High-Voltage Solar Array Due to Arcing in Plasma Environment  
**A05-020** Electrical Performance from Bifacial Illumination International Space Station Photovoltaic Array  
**A05-089** Operational Workarounds for the Space Station Beta Gimbal Anomaly  
**A05-067** Solar Arrays for Direct-Drive Electric Propulsion: Arcing at High Voltages  
**A05-039** Secondary Discharges on Solar Arrays: Vacuum Arcs Across Adjacent Biased Cells  
**A05-137** Development, Design, and Testing of PowerSphere Multifunctional Ultraviolet-Rigidizable Inflatable Structures

### ***Spacecraft Propulsion System Integration***

- A05-036** Self-Pressurization of Large Spherical Cryogenic Tanks in Space  
**A05-068** Solar Arrays for Direct-Drive Electric Propulsion: Electron Collection at High Voltages  
**A05-041** Low-Cost Cold-Gas Reaction Control System for the Slosat FLEVO Small Satellite  
**A05-040** Restoring Redundancy to the Wilkinson Microwave Anisotropy Probe Propulsion System  
**A05-019** Pulsed Plasma Thruster System for Microsatellites

### ***Spacecraft Radiation Protection***

- A05-136** Toolkit for Updating Interplanetary Proton Cumulated Fluence Models  
**A05-133** Correlation of Double Star Anomalies with Space Environment

### ***Spacecraft Sensor Systems***

- A05-118** Uncertainty Analysis of Propellant Gauging System for Spacecraft  
**A05-092** Optimal Frequency Configuration for Dual One-Way Ranging Systems

### ***Spacecraft Structural Configuration, Design, and Analysis***

- A05-061** Thermal Design of Liquid Droplet Radiator for Space Solar-Power System  
**A05-026** Simulation of Foam-Impact Effects on the Space Shuttle Thermal Protection System  
**A05-035** Effective Modeling and Nonlinear Shell Analysis of Thin Membranes Exhibiting Structural Wrinkling  
**A05-034** Stability of Flexible Spacecraft During a Shallow Aeroassist

### ***Spacecraft Test and Evaluation***

- A05-124** Mars Exploration Rover Transverse Impulse Rocket Cover Thermal Protection System Design Verification  
**A05-091** Number of Arcs Estimated on Solar Array of a Geostationary Satellite  
**A05-039** Secondary Discharges on Solar Arrays: Vacuum Arcs Across Adjacent Biased Cells  
**A05-076** Debonding Failure of Sandwich-Composite Cryogenic Fuel Tank with Internal Core Pressure  
**A05-102** Oxidation Behavior of Siliconcarbide-Based Materials by Using New Probe Techniques

### ***Spacecraft Thermal Management***

- A05-021** Changes in the Optical Properties of Simulated Shuttle Waste Water Deposits: Urine Darkening  
**A05-104** Thermal Buckling of Metal Foam Sandwich Panels for Convective Thermal Protection Systems  
**A05-061** Thermal Design of Liquid Droplet Radiator for Space Solar-Power System  
**A05-057** Aeroheating Thermal Model Correlation for Mars Global Surveyor Solar Array

## **STRUCTURAL MECHANICS AND MATERIALS**

### ***Dynamic Model Analysis***

- A05-012** Nonlinear Dynamic Analysis to Extend the Value of Liquid Rocket Qualification Test  
**A05-008** Dynamic Model Establishment of a Deployable Missile Control Fin with Nonlinear Hinge  
**A05-139** Pendulum Mode Control of Free-Free Launcher Structural Models in Gravity Fields  
**A05-103** Improved Method of Mixed-Boundary Component-Mode Representation for Structural Dynamic Analysis

### ***Flexible and Active Structures***

- A05-045** Multiple Sensors and Actuators for Vibration Suppression of an Inflated Torus  
**A05-075** Electroactive-Polymer Actuators for Controlling Space Inflatable Structures  
**A05-065** Multibody Dynamics Modeling of Segmented Booms of the Mars Express Spacecraft  
**A05-106** Dynamic Wrinkle Reduction Strategies for Cable-Suspended Membrane Structures  
**A05-138** Zero- and One-g Comparison of Surface Profile in Single-Curved Parabolic Membrane

### ***Materials Structural Properties***

- A05-099** Material Characterization of Shuttle Thermal Protection System for Impact Analyses  
**A05-079** Through-Thickness Connection of Matrix Cracks in Laminate Composites for Propellant Tank  
**A05-043** Experimental Cryogenic Gas Leakage Through Damaged Composite Laminates for Propellant Tank Application

### ***Structural Composite Materials***

- A05-043** Experimental Cryogenic Gas Leakage Through Damaged Composite Laminates for Propellant Tank Application  
**A05-078** Fairing Noise Control Using Tube-Shaped Resonators  
**A05-079** Through-Thickness Connection of Matrix Cracks in Laminate Composites for Propellant Tank  
**A05-076** Debonding Failure of Sandwich-Composite Cryogenic Fuel Tank with Internal Core Pressure  
**A05-075** Electroactive-Polymer Actuators for Controlling Space Inflatable Structures  
**A05-137** Development, Design, and Testing of PowerSphere Multifunctional Ultraviolet-Rigidizable Inflatable Structures

### ***Structural Design***

- A05-011** Variational Coupled Loads Analyses: Reducing Risk in Development of Space-Flight Hardware

**A05-106** Dynamic Wrinkle Reduction Strategies for Cable-Suspended Membrane Structures

***Structural Durability (Including Fatigue, Fracture, and Environmental Degradation)***

**A05-026** Simulation of Foam-Impact Effects on the Space Shuttle Thermal Protection System

**A05-076** Debonding Failure of Sandwich-Composite Cryogenic Fuel Tank with Internal Core Pressure

**A05-079** Through-Thickness Connection of Matrix Cracks in Laminate Composites for Propellant Tank

**A05-088** Photostability of Reflecting Coatings Based on the  $\text{ZrO}_2$  Powders Doped with  $\text{SrSiO}_3$

**A05-043** Experimental Cryogenic Gas Leakage Through Damaged Composite Laminates for Propellant Tank Application

**A05-116** Lessons Learned During Redesign of Shuttle Reaction Control Thruster Pilot Seat Assembly

***Structural Dynamics and Characterization***

**A05-103** Improved Method of Mixed-Boundary Component-Mode Representation for Structural Dynamic Analysis

**A05-105** Dynamic Characteristic Prediction of Large Satellite Antennas by Component Tests

**A05-139** Pendulum Mode Control of Free-Free Launcher Structural Models in Gravity Fields

**A05-117** Simplified Vibration Model of Solid-Rocket Motor Coupled with Solid Propellant

**A05-011** Variational Coupled Loads Analyses: Reducing Risk in Development of Space-Flight Hardware

**A05-106** Dynamic Wrinkle Reduction Strategies for Cable-Suspended Membrane Structures

***Structural Finite Elements***

**A05-035** Effective Modeling and Nonlinear Shell Analysis of Thin Membranes Exhibiting Structural Wrinkling

**A05-096** Fluid Structure Interaction on a Generic Body-Flap Model in Hypersonic Flow

***Structural Modeling***

**A05-035** Effective Modeling and Nonlinear Shell Analysis of Thin Membranes Exhibiting Structural Wrinkling

***Structural Optimization***

**A05-011** Variational Coupled Loads Analyses: Reducing Risk in Development of Space-Flight Hardware

***Thermal Effects***

**A05-124** Mars Exploration Rover Transverse Impulse Rocket Cover Thermal Protection System Design Verification

**A05-104** Thermal Buckling of Metal Foam Sandwich Panels for Convective Thermal Protection Systems

**A05-122** Modeling of Mechanical Ablation in Thermal Protection Systems

**THERMOPHYSICS AND HEAT TRANSFER**

***Ablation, Pyrolysis, Thermal Decomposition and Degradation***

**A05-122** Modeling of Mechanical Ablation in Thermal Protection Systems

**A05-121** Navier–Stokes Solutions with Finite Rate Ablation for Planetary Mission Earth Reentries

**A05-101** Direct Simulation Monte Carlo Investigation of Hyperthermal Oxygen Beam Exposures

***Aerothermodynamics/Thermal Protection***

**A05-121** Navier–Stokes Solutions with Finite Rate Ablation for Planetary Mission Earth Reentries

**A05-102** Oxidation Behavior of Siliconcarbide-Based Materials by Using New Probe Techniques

**A05-027** Aerothermodynamic Environments and Thermal Protection for a Wave-Rider Second Stage

**A05-123** High-Temperature Thermodynamic Properties of Mars-Atmosphere Components

**A05-072** Control of Hypersonic Turbulent Skin Friction by Boundary-Layer Combustion of Hydrogen

**A05-124** Mars Exploration Rover Transverse Impulse Rocket Cover Thermal Protection System Design Verification

**A05-129** Closed-Loop Trajectory Simulation for Thermal Protection System Design for Neptune Aerocapture

***Cryogenics***

**A05-036** Self-Pressurization of Large Spherical Cryogenic Tanks in Space

***Heat Conduction***

**A05-001** Stationary Coupling of Hypersonic Nonequilibrium Flows and Thermal-Protection-System Structure

***Nonintrusive Diagnostics***

**A05-087** Lidar Backscatter Properties of  $\text{Al}_2\text{O}_3$  Rocket Exhaust Particles

***Radiation Interchange Between Surfaces***

**A05-001** Stationary Coupling of Hypersonic Nonequilibrium Flows and Thermal-Protection-System Structure

***Thermal Control***

**A05-061** Thermal Design of Liquid Droplet Radiator for Space Solar-Power System

**A05-088** Photostability of Reflecting Coatings Based on the  $\text{ZrO}_2$  Powders Doped with  $\text{SrSiO}_3$

***Thermal Modeling and Analysis***

**A05-024** Nonfree Space Radiating Fin Optimum Dimension and Efficiency Correlations

**A05-059** Transpiration Cooling Performance in LOX/Methane Liquid-Fuel Rocket Engines

**A05-057** Aeroheating Thermal Model Correlation for Mars Global Surveyor Solar Array

**A05-122** Modeling of Mechanical Ablation in Thermal Protection Systems

***Thermochemistry and Chemical Kinetics***

**A05-123** High-Temperature Thermodynamic Properties of Mars-Atmosphere Components

**A05-102** Oxidation Behavior of Siliconcarbide-Based Materials by Using New Probe Techniques

**A05-121** Navier–Stokes Solutions with Finite Rate Ablation for Planetary Mission Earth Reentries

***Thermophysical Properties***

**A05-123** High-Temperature Thermodynamic Properties of Mars-Atmosphere Components