

Daniele Mortari Symposium Program

December 11: Morning sessions,

Time	Speaker	Title
08:25	D. Lagoudas (A&M)	Symposium Welcome Address
08:30	A. Negrete, S. Choi, O. Abdelkhalik (Iowa State)	Shape-based Approximation for Low-Thrust Spacecraft Trajectory Using Chebyshev Polynomials
08:50	M. Romano (TUM)	Time-Optimal Control of Linear Time Invariant Systems with Application to Spacecraft Relative Maneuvering
09:10	S. Calabrese, D. Mortari (A&M)	Solving Approximate ODEs using Theory of Functional Connections: Application to Soil Moisture Dry-Down Estimation
09:30	R. Miles (A&M)	Red Rotating Laser Beacon for Collision Warning and Avoidance
09:50	F. Criscola, D. Canales, A. Farres (Embry-Riddle)	Stability Analysis and Applications of Quasi-Periodic Motion Around Earth-Moon L_4 Short-Period Orbits
10:10	20-min coffee break	

Session 1: **Chair: Yalchin Efendiev**

Time	Speaker	Title
10:30	S. Choi, O. Abdelkhalik (Iowa State)	Shape-Based Low-Thrust Δv Prediction Using Deep Neural Networks
10:50	F. D’Onofrio, R. Zanetti (UT)	Particle flow filtering on SE(3) for pose estimation
11:10	R. Furfaro (UoA)	From TFC to X-TFC: A Mortari-Inspired Journey to Physics-Informed Optimal Control for Spaceflight
11:30	F. Giraldo-Grueso, C. D’Souza (JSC)	Vent Modeling as Point Processes For Crewed Missions
11:50	G. Chamitoff (A&M)	Space Teams PRO: A Digital Twin of the Space Environment for Space Mission Design, Analysis, Planning and Operations
12:30	90-min catering lunch	

Session 2: **Chair: Richard Linares**

December 11: Afternoon sessions,

Time	Speaker	Title
14:00	W. Lee, T. Twellman, G. Chamitoff (A&M)	Sigma-Point-Informed Imagery for Landing Terrain-Relative Navigation
14:20	A. Sein, G. Chamitoff (A&M)	The Stellar Positioning System for Small Body Exploration
14:40	R. Mamich, K. Michaelson, R. Zanetti (UT)	Adaptive Relative Spacecraft Navigation in Proximity Operations with Unmodeled Target Behavior
15:00	Y. Efendiev (A&M)	Multicontinuum Homogenization for Macroscopic Modeling of Complex Multiscale Processes
15:20	A. Negrete, O. Abdelkhalik (Iowa State)	On Optimal Control of Dynamic Systems
15:40	20-min coffee break	

Session 3: **Chair: Chris D'Souza**

16:00	A. Rigato, R. Zanetti (UT)	Attitude Estimation using Redundant Gyroscopes
16:20	J. Junkins, K. Yamamoto, A. Bire (A&M)	Adaptive Multi-Resolution Input-Output Modeling in n-Dimensions
16:40	L. Iess (La Sapienza)	Novel Tracking Systems for Orbit Determination and Planetary Geodesy
17:00	R. Bhattacharya (A&M)	Robust Cislunar Navigation with Performance Guarantees
17:20	R. Linares (MIT)	From Flower Constellations to Orbital Capacity: Structuring the Crowded Sky
18:00	Dinner on your own	

Session 4: **Chair: Maruthi Akella**

December 12: Morning sessions,

Time	Speaker	Title
08:30	S. Ziegler (Space Kinetic)	From Defense to Dual-Use: Applying the Nitze Criteria to Commercial Space for Effectiveness, Survivability and Cost Effectiveness
08:50	S. Aliberti, M. Romano (TUM)	Lyapunov-Based Low-Thrust Control and Stabilization of a Tethered Satellite System in Arbitrary Attitude Configurations
09:10	T. White, D. Mortari (A&M)	Solving Discontinuous Differential Equations using The Theory of Functional Connections
09:30	A. Aguilar, D. Selva (A&M)	Decentralized Autonomous Operation Methods for Agile Earth-Observing Satellite Constellations under Dynamic Event Monitoring Missions
09:50	J. Joshi, R. Zanetti, R. Russel (UT)	Angle-Based Star Occultation Measurements for Spacecraft Navigation
10:10	20-min coffee break	

Session 5: **Chair: Marcello Romano**

Time	Speaker	Title
10:30	S. Choi, T. Gibson, O. Abdelkhalik (Iowa State)	Learning-Based Prediction of Deep Space Maneuver Positions for Rendezvous Missions
10:50	A. Carrasco, R. Linares (MIT)	Fine-tuning LLMs for Autonomous Spacecraft Control: A Case Study Using Kerbal Space Program
11:10	I. Paranjape, S. Chakravorty (A&M)	Probabilistic Methods for Initial Orbit Determination and Target Tracking in Cislunar Space
11:30	L. Federici, F. Curti (UoA)	A Pulse-Width Modulated Thruster Control for Autonomous Docking via Reinforcement Learning
11:50	A. Zamora, K. DeMars (A&M)	Stability and Implementation of the Square Root Reproducing Kernel Hilbert Space Extended Kalman Filter for Robust Spacecraft Navigation and Tracking
12:30	90-min catering lunch	

Session 6: **Chair: Renato Zanetti**

December 12: Afternoon sessions,

Time	Speaker	Title
14:00	B. Dunbar (A&M)	A Study on the Effect of Reduced Gravitational Acceleration (Moon and Mars) and Solid Surface Energies on Fluid Two Phase Buoyancy
14:20	J. Connolly (A&M)	TAMU-SPIRIT – A&M’s Satellite Campus in Space
14:40	M. Maadani, E. Butcher (UoA)	A Containment-Motivated Numerical Algorithm for Computing the Mean of Rotations on SO(3)
15:00	P. Lealiiee, M. Akella (UT)	Information-Driven Spacecraft Trajectory Planning for Inspection of Uncooperative Space Vehicles
15:20	K. Karunakaran (Mason)	Modeling Contrail Formation Via an SIR-Framework
15:40	20-min coffee break	

Session 7: **Chair: Raktim Bhattacharya**

16:00	K. Gupta, A. D’Ambrosio, A. Scorsoglio, R. Furfaro (UoA)	Physics-informed Deep Neural Operators for xGEO Angles-only Initial Orbit Determination
16:20	B. Mahajan (JSC)	Regularized Universal Lambert Solver using Kustaanheimo-Stiefel Transformation
16:40	B. Spratling (SingAccord)	Any-3-Star Identification Performance Improvements
17:00	M. Majji, T. Ahrens (A&M)	The Norm Dependent Wahba Problem - Some Solutions
17:20	K. Chadha et al. (A&M)	Propellant Efficiency Optimization for Starship-Class Earth-Mars Trajectories: Comparative Analysis of Propulsion Maneuver Options and Refueling Infrastructure Configurations
17:50	J. Junkins (A&M)	Plenary Talk Introduction
18:00	D. Mortari (A&M)	Plenary Talk
19:00	Dinner in Chevron	

Session 8: **Chair: Roberto Furfaro**