

International Conference on Flight Vehicles, Aerothermodynamics and Re-entry Missions & Engineering

FAR 2019

30 September - 3 October 2019, Monopoli, Italy



Sunday 29th September 2019					
17:00 => 20:00	REGISTRATION				
19:00 => 21:00	WELCOME COCKTAIL				
Monday 30th September 2019					
8:30	REGISTRATION				
9:00	WELCOME COFFEE				
ROOM	PLENARY SESSION – Torre Cintola / Sala Cupola				
10:00	CONFERENCE OPENING (G. Ortega, ESA)				
10:30	KEYNOTE SPEECH: As "FAR" as Italy can go... (G. Saccoccia, ASI)				
11:00	KEYNOTE SPEECH: Leonardo: the Flight and the Moon: Why the Apulian Science Academy is celebrating Leonardo (Prof. L. Borzacchini and Prof. E. Scandale, University of Bari)				
11:30	KEYNOTE SPEECH: Critical data analysis of an hypersonic speed departure: the Space Shuttle Columbia last flight (General Roberto Vittori, Italian Government)				
12:00	LUNCH				
14:00	KEYNOTE SPEECH: The Space Rider Development Programme (J. Longo, ESA)				
14:30	PLENARY ROUND TABLE: Enabling Sub-orbital Flight: Perspectives, Challenges, and Opportunities G.Saccoccia (ASI), M. Sippel (DLR), A. Cassell (NASA), F. Cupertino (University of Bari), T. Hideyuki (JAXA), G. Ortega (ESA)				
15:30	COFFEE BREAK				
	Session 1.1 - Expendable Space Transportation Systems and Exploration Vehicles	Session 1.2 - Re-usable Space Transportation Systems	Session 1.3 - Supersonic and Hypersonic Flight Missions and Vehicles	Session 1.4 - Decelerators	
ROOM	Torre Cintola/Sala Cupola	Levante	Primo Piano (L)	Primo Piano (S)	Saletta meno uno
Chairpersons	Jorgen Bru (ESA) Alejandro M. San Martin (JPL)	Helmut Ciezki (DLR), Don Ellerby (NASA) Mariano Sanchez (Deimos)	Tanno Hideyuki (JAXA) Nicole Viola (Politechnic of Torino) Jean-Francois Perelgritz (Airbus DS)	Pierluigi Pirrelli (SITAEL) Steve Lindgard (Vorticity) Philippe Tran (ArianeGroup)	
16:00	Particle Size In Solid Rocket Motor Plume: New Experimental Method (Filippo Maggi, Politecnico Di Milano)	Analysis of VTVL and VTHL Reusable Launch Vehicle Configurations (Leonid Bussler, DLR)	Adaptive Deployable Entry Placement Technology (Adept)Sounding Rocket Flight Test (Alan Cassell, NASA Ames Research Center)	Development and Testing of the Parachute Recovery System for the Reusable PLD Space Miura 1 Suborbital Rocket (Charles Lowry, Airborne Systems North America)	
16:20	High Altitude Drop Tests of the Exomars Rsp Parachute System (John Underwood, Vorticity Ltd)	Space Rider Critical Reusability Challenges (Angelo Denaro, Thales Alenia Space S.p.a.)	Preliminary Safety Assessment of Candidate Stratofly Vehicle Configurations (Khooshboo Dani, University of Southern California)	Design and Qualification Testing of Two European Parachute Mortars for the Esa Exomars 2020 Mission (Rudi Matthijssen, APP ArianeGroup)	
16:40	Feasibility of Development of Green Throttleable Liquid Propulsion for Exploration and Space Transportation (Adam Okninski, Institute of Aviation)	Noise and Vibration Simulation and Measurement In High Speed Vehicles (Nicholas Eaton, Space Acoustics GmbH)	Numerical Simulation of the HYPHOT Li Combustor for Hypersonic Propulsion (Pietro De Palma, Politecnico di Bari)	Mechanically Deployable Aero-Decelerators for Mars Entry (Lisa Peacocke, Imperial College London)	
17:00	Flight Vehicle Design of A Manned Mars Entry System (Csaba Jéger, ESA)	Aurora – A New Pioneering RLV Concept (Wolfgang Fischer, POLARIS)	Sratofly Project Approaches for Innovative Structural Schemes and Modelization of Hypersonic Aircraft and Space Vehicles (Jacobo Diaz, Universidade da Coruña)	Evolution and Evaluation of the DARE Large Envelope Advanced Parachute System (Lars Pepermans, Delft Aerospace Rocket Engineering)	
17:20		The FLPP-LPSR (Liquid Propulsion Stage Recovery) Project: Description and Results (Francisco Garcia, Payload Aerospace S.L.)		CFD / FSI Simulaton of Parachute Inflation (John Underwood, Vorticity Ltd)	
17:40	END OF DAY 1				
19:00 => 21:00	WELCOME COCKTAIL sponsored by SITAEL (P. Pirelli, SITAEL) and AWARD to the Best Conference Paper (J. Longo, ESA)				

Tuesday 1st October 2019					
	Session 2.1 - Re-usable Space Transportation Systems	Session 2.2 - Supersonic and Hypersonic Flight Missions and Vehicles	Session 2.4 - Testing Facilities, Verification and Validation Methods		Session 2.3 - Thermal Protection Systems TPS
ROOM	Torre Cintola/Sala Cupola	Levante	Primo Piano (L)	Primo Piano (S)	Saletta meno uno
Chairpersons	Jorgen Bru (ESA) Gerrie Mullen (Reaction Engines) Damien Gille (Arianespace)	Kazuhisa Fujita (JAXA) Rodrigo Haya Ramos (SENER) Nicole Viola (Politechnic of Torino)	Stijn Lemmens (ESA) Alessandro Gabrielli (ASI) Gérard Ordonneau (ONERA)		Thomas Reimer (DLR) Jean-Marc Bouilly (ArianeGroup) Heiko Ritter (ESA)
9:10	Subsonic and Supersonic Ground Experiments for the Callisto VTVL Launcher Demonstrator (Johannes Rieher, DLR)	Development of A Novel Mass Flow Measurement Device for High Speed Intake Testing (Luke Doherty, University of Oxford)	Performance Capability Experiments In T6: A Hypervelocity, Transient and Multi-Mode Ground Test Facility for High-Enthalpy Aerothermodynamics Research (Peter Collen, University of Oxford)		European Solutions for Heatshields of High Energy Entry Probes (Jean-Marc Bouilly, ArianeGroup Sas)
9:30	Characterization of SRM Plumes With Alumina Particulate In Subscale Testing (Dominik Saile, DLR)	The Influence of Mach Waves On Laminar-Turbulent Transition for Supersonic Flow (Ivan Egorov, TSAGI)	Experimental Investigation of Supersonic Panel Flutter (Alessandro D'aguanno, Delft University of Technology)		Overview of Heatshield for Extreme Entry Environment Technology (HEEET) (Don Ellerby, NASA)
9:50	A Sub-Orbital Testbed Vehicle for Engine-Assisted Braking On Re-Entry (Renato Salles, Omnidea Lda.)	Modeling and Simulation of Supersonic Combustion and Plasma Assisted Combustion (Christa Fureby, the Swedish Defense Research Agency - FOI)	Aerospace TPS Material Characterizations At CIRA By Means of SLI Radioactive Beam Tracer, IBA and IR-thermography (Mario De Cesare, CIRA)		Ballistic Entries for Saturn, Uranus, and Neptune With HEEET TPS (Dinesh Prabhu, Ama, Inc.)
10:10	Thermal and Mechanical Analysis of the Body Flap Assembly of Space Rider Re-Entry Module (Roberto Sciciliano, CIRA)	From Hypersonic Aircraft To Ascent and Re-Entry Vehicles: European Technology Roadmaps for Future Reusable Space Transportation Systems (Roberta Fusaro, Politecnico di Torino)	Refurbishment and Characterisation of the Oxford Low Density Hypersonic Wind Tunnel (Nathan Donaldson, University of Oxford)		Preliminary Heatshield Design for A Potential European Probe To An Outer Planet (Heiko Ritter, ESA)
10:30	Ultra-Fast Passenger Transport Options Enabled By Reusable Launch Vehicles (Martin Sippel, DLR)	Stratofly Vehicle: A Test Bed for Integrated Solid Metals Heat Pipes Technology (Roberta Fusaro, Politecnico di Torino)	Volume Reconstruction of Optically Thin Plasma Flows By 3-D Light Field Deconvolution (Martin Eberhart, University of Stuttgart / Institute of Space Systems)		Study of Functionally Graded Ablative Material With Density Gradient (Toshiyuki Suzuki, JAXA)
10:50	Miura-1 Avionics System: An Affordable and Reliable Approach (Emanuele Di Sotto, GMV)	Stratofly thermal and Energy Management Concept: Enabling Technology Towards Reusable Access To Space and Reentry Vehicles (Roberta Fusaro, Politecnico di Torino)	Solid Carbon Produced During Titan Entry Simulation By An Arc-Driven Flow Facility (Antonio Esposito, University of Naples Federico II)		Development of A Low-Density Phenolic-Impregnated Fibrous Ablator (Christian Zuber, DLR)
11:10	COFFEE BREAK				
	Session 2.5 - Re-usable Space Transportation Systems and Sub-orbital and Small Launch Systems	Session 2.6 - Supersonic and Hypersonic Flight Missions and Vehicles	Session 2.8 - Testing Facilities, Verification and Validation Methods		Session 2.7 - Thermal Protection Systems TPS
ROOM	Torre Cintola/Sala Cupola	Levante	Primo Piano (L)	Primo Piano (S)	Saletta meno uno
Chairpersons	Jorgen Bru (ESA) Burkard Esser (DLR) Mariano Sanchez Nogales (Deimos Space)	Kazuhisa Fujita (JAXA) Rodrigo Haya Ramos (SENER) Nicole Viola (Politechnic of Torino)	Thierry Magin (VKI) Marco Marini (CIRA) Gérard Ordonneau (ONERA)		Thomas Reimer (DLR) Jean-Marc Bouilly (ArianeGroup) Heiko Ritter (ESA)
11:30	PLD Space Reusable Small Launchers: Recovery System Strategy for Two Rocket Developments (Francisco Garcia, Payload Aerospace S.L.)	Main Challenges and Goals of the H2020 Stratofly Project (Roberta Fusaro, Politecnico di Torino)	Planned Wind Tunnel Experiments At DLR Köln for the Reusability Flight Experiment (REFEX) (Andreas Flock, DLR)		Cork P50 and TPS3L Ablation Experiments for the Demise Observation Capsule Including An Adhesive Bonded TPS3L Structure (Bernd Helber, Von Karman Institute)
11:50	New Suborbital Rocket Demonstrator - Ilr-33 Amber (Michal Pakosz, Institute of Aviation)	Experimental Investigation of Fluidic Thrust Vectoring for Scramjets (Christopher Hambidge, University of Oxford)	Total Temperature Measurements In the Oxford High Density Tunnel (Tobias Herrmann, University of Oxford)		Characterization of the thermal Degradation of Carbon-Phenolic Materials: An Experimental Effort On the ZURAM® Ablator (Francisco Torres Herrador, Von Karman Institute)
12:10	Small-Launchers Platforms Comparison (Jasmine Rimani, Politecnico Di Torino)	Assessment of Combustion Models for thermodynamic Modeling of the Engines for Hypersonic Propulsion (Ali Can Ispir, Von Karman Institute)	3D Focused Schlieren Imaging Using A Plenoptic Camera (Philipp Kerth, University of Oxford)		Towards High Resolution Photogrammetric Surface Analysis of Ablation Processes In High-Enthalpy Air Plasma Flow (Felix Grigat, Institute of Space Systems IRS)
12:30		Optimization Framework Coupled With Ecosimpro Platform for the Propulsion Power Plant of A Hypersonic Aircraft (Ali Can Ispir, Von Karman Institute)	A Novel Approach To Flight-To-Ground Scaling In Plasma Facilities: Axisymmetric To Planar Transformation (David Leiser, University of Stuttgart)		Carbon/Phenolic Composites and Phenolic Impregnated Carbon Ablators based on ex-PAN carbon fibers (Maurizio Natali, University of Perugia)
12:50	LUNCH				
ROOM	PLENARY SESSION – Torre Cintola / Sala Cupola				
14:30	PLENARY ROUND TABLE: Micro and Nano-launcher Systems				
	T. Kranz (ESA), J. Bru (ESA), A. Gabrielli (ASI), G. Avanzini (Distretto Tecnologica Aerospaziale DTA/UniSalento), M. Bello Mora (Deimos), A. Argemi Samso (PANGEA), J. Vila (ArianeWorks), F. Spaziani Brunella (AVIO ELV), T. Pardal (ONMIDEA), S. Caruel (Arianespace), C. Schmierer (HyImpulse), A. Boiron (NAMMO)				
16:00	COFFEE BREAK				
	Session 2.9 - Aerothermodynamics	Session 2.10 - Supersonic and Hypersonic Flight Missions and Vehicles	Session 2.12 - Testing Facilities, Verification and Validation Methods		Session 2.11 - Thermal Protection Systems TPS
ROOM	Torre Cintola/Sala Cupola	Levante	Primo Piano (L)	Primo Piano (S)	Saletta meno uno
Chairpersons	Burkard Esser (DLR) Marcello Amato (CIRA) Philippe Tran (Arianespace)	Kazuhisa Fujita (JAXA) Rodrigo Haya Ramos (SENER) Nicole Viola (Politechnic of Torino)	Thierry Magin (VKI) Marco Marini (CIRA) Gérard Ordonneau (ONERA)		Thomas Reimer (DLR) Jean-Marc Bouilly (ArianeGroup) Heiko Ritter (ESA)

16:20	Development of Non-Oscillatory Lattice Boltzmann Method for Shock Wave Flows (Zuheyr Alsalihi, Von Karman Institute)	Hydrogen-Based Thrusters for Supersonic and Hypersonic Flight: Experimental Characterization (Filippo Maggi, Politecnico Di Milano)	Finite Element thermal Modelling for Complex Isotropic Graphite Specimens Tested In the L3K Arc Heater (Matthew Ross, DSTL)		Surrogate Modeling Assisted Calibration of TACOT Material Database Through Bayesian Inference Using MSL Flight Data (Przemyslaw Rostkowski, University Of Illinois At Urbana-champaign)
16:40	Vibrational Energy Balance In Exchange and Non-Reactive Collisions of Nitric Oxide In Dissociated Air (Danil Andrienko, Texas A&M University)	Stratofly Project Challenges In the Fields of Airframe, Aerothermodynamics, High-Speed Propulsion and Energy Management Systems (Marco Marini, CIRA)	Experimental Investigation of Jet In Supersonic Cross-Flow By Means of PIV (Ferry Schrijer, Delft University of Technology)		Ablative-Material Numerical Test International Series (AblanTIS): An Experimental/Numerical Effort To Support the Validation of Material thermal-Response Tools (Alessandro Turchi, Von Karman Institute)
17:00		Propulsion Test Vehicles (Gerrie Mullen, Reaction Engines Ltd)	Need for Low-Noise High-Speed Facilities In Europe (Johan Steelant, ESA)		Multi-Scale Modeling of Low-Density Carbon-Phenolic Ablators (Michael Barnhardt, NASA)
	Session 2.13 - Aerothermodynamics	Session 2.14 - Supersonic and Hypersonic Flight Missions and Vehicles	Session 2.16- Testing Facilities, Verification and Validation Methods		Session 2.15 - Thermal Protection Systems TPS
ROOM	Torre Cintola/Sala Cupola	Levante	Primo Piano (L)	Primo Piano (S)	Saletta meno uno
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17:20	Detailed Chemistry Simulations of Diffusing Meteor Trails With Application To Radio Observations (Federico Bariselli, von Karman Institute for Fluid Dynamics)	Preliminary Numerical Characterization of Stratofly Vehicle'S Intake (Pietro Roncioni, CIRA)			Microscopic Imaging of Heatshield Oxidation In 4D (Francesco Panerai, University of Illinois at Urbana-champaign)
17:40	Technology Development and Infusion by NASA's Entry Systems Modeling Project (Michael Barnhardt, NASA)	Stratofly High-Speed Propelled Vehicle Preliminary Aero-thermal Design (Roberto SCIGLIANO, CIRA)			Exploring the Impact of the Initial Temperature Field Uncertainty On the Response of Ablative Materials Using Model Selection Techniques (Giulio Gori, INRIA - CMAP Ecole Polytechnique)
18:00	Calculation of Radiative Processes In Plasmas Using the Particle-Based Pic-Dsmc Code Piclas (Julian Beyer, University of Stuttgart)	Shock-Boundary Layer Interaction Phenomena In A Hydrogen Transpiration Cooled Supersonic Combustion Ramjet (Scramjet) (Friedolin Strauss, DLR)			Coupling Strategies for Modeling TPS (Alexandre Martin, University of Kentucky)
ROOM	PLENARY SESSION – Torre Cintola / Sala Cupola				
18:30	KEYNOTE SPEECH: ArianeWorks and the future of European Launchers (J. Vila, CNES)				
19:00	END OF DAY 2				
20:00 23:30	Poolside Dinner at the Beach Bar of Torre Cintola				
Wednesday 2nd October 2019					
ROOM	PLENARY SESSION – Torre Cintola / Sala Cupola				
8:30	KEYNOTE SPEECH: Space Passenger Transportation Systems: Comparison of SpaceLiner and SpaceX' BFR (M. Sippel, DLR)				
	Session 3.1 - Aerothermodynamics	Session 3.2 - Supersonic and Hypersonic Flight Missions and Vehicles and (Re)-Entry and Aero-Assisted Vehicles	Session 3.3 - Thermal Protection Systems TPS	Session 3.4 - Engineering Software Tools	Session 3.5 - Workshop on Technology Roadmaps to target Reusability
ROOM	Torre Cintola/Sala Cupola	Levante	Primo Piano (L)	Primo Piano (S)	Saletta meno uno
Chairpersons	Adam Okninski (Polish Institute of Aviation) Philippe Tran (ArianeGroup) Stein Lemmens (ESA)	Alejandro Miguel San Martin (JPL) Kazuhisa Fujita (JAXA) André Fueser (ArianeGroup)	David Glass (NASA) Jean-Marc Bouilly (ArianeGroup) Heiko Ritter (ESA)	Fabio Pinna (VKI) Jim Merrifield (Fluid Gravity) Mariano Sanchez Nogales (Deimos Space)	Jorgen Bru (ESA) Victor Fernandez Villace (ESA) Nicole Viola (POLITO)
9:10	State To State Vs Multi-Temperature Models for Simulating Hypersonic Flows (Francesco Bonelli, Politecnico Di Bari)	Experimental and Numerical Investigation On Static and Dynamic Stability of A Blunted Body Configuration – Project Overview (Thomas Gawehn, DLR)	From IXV To Space Rider : CMC thermal Protection System Evolutions (Jacques Valverde, ArianeGroup)	Advanced Approaches of Structural Safety Management In Multidisciplinary Optimization of Hypersonic Aircrafts and Space Vehicles (Aitor Baldomir, University of A Coruña)	Part 1 – Methodologies and Tools to support Strategic Decision Technology Roadmap Methodology at a Glance (N. Viola, POLITO)
9:30	Transition Prediction On Reentry-F Trajectory With Pse At Chemical Equilibrium (Jean-Philippe Brazier, ONERA)	Experimental Study On Static and Dynamic Stability of A Blunt Body Configuration (Thomas Gawehn, DLR)	Optimal Design of Multilayer thermal Protection Based On Materials Morphology (Aleksy Nenarokomov, Moscow Aviation Institute)	Trade-off and Models Generation for Small Launchers (Giuseppe Governale, Politecnico Di Torino)	TRIS - Technology Roamapping Strategy Tool (R. Fusaro, POLITO)
9:50	Development of A Vibration-Dissociation Model for High-Enthalpy Air (Tom Schwartzentruber, University of Minnesota)	Numerical Investigation of Wind Tunnel Test To Measure Dynamic Stability (Bodo Reimann, DLR)	Thermosensitive Coating Dedicated To Smart TPS for Very High Temperature - 850 °C To 1650°C (Lilian Martinez, NDT°physics)	A reduced discretization approach for a re-entry optimal control problem with minimum heating (Blanca Pablos, Universitaet der Bundeswehr Munich)	Methodology and Tools for Technology Roadmapping: Open Discussion Francesco Morsillo SITAEL; Fulvio Spaziani Brunella AVIO ELV; Jim Merrifield FGE; Marc Vales DASSAULT; Marco Marini CIRA; Mariano Sanchez Nogales DEIMOS; Rodrigo Haya Ramos SENER; Thilo Kranz ESA STS; Tiago Parda OMNIDEA
10:10	Aerothermodynamics Assessment of An Entry Descent and Landing System for A Penetrator Mission On Mars (Davy Chaillot, ArianeGroup)	Hybrid RANS/LES Computations of Pitch Damping Derivatives for A Blunt Body Configuration (Lars Tysell, Foi, Swedish Defence Research Agency)	Investigation of An RLV Cryogenic Tank Insulation Including A Purge Gap System (Carolin Rauh, DLR)	Automatic Derivation of Stability Equations and their Application To Hypersonic and High-Enthalpy Shear Flows (Fabio Pinna, Von Karman Institute)	Part 2 – European Technology Roadmap for hypersonic transportation European Past and Current Projects in Hypersonic Transportation (V. Fernandez, ESA / R. Fusaro, POLITO)
10:30	Direct Numerical Simulations of A Chemical Non-Equilibrium Hypersonic Flow On A Compression Corner With Roughness Elements (Giuseppe Chiapparino, Technical University of Munich)	Flying Qualities Analysis of DYNAST (Dynamic Stability of Capsules and Blunt Bodies At Angle of Attack) (Davide Bonetti, DEIMOS Space S.L.U.)	Research and Development of Plasma Sprayed UHTC Coatings for Hypersonic Applications (Mario De Stefano Fumo, CIRA)	Robust Optimal Planning of Controlled Re-Entry Trajectories With Atmospheric Uncertainties (Manuel Sanjurjo Rivo, Universidad Carlos III de Madrid)	Case study 1: Roadmap for the H2020 STRATOFly Project (N. Viola, POLITO)

10:50	Numerical Predictions of Dust-Induced Heat Flux Augmentation In Hypersonic Blunt-Body Flows Using A Discontinuous Galerkin Multiphase Flow Solver (Eric Ching, Stanford University)	Study of A Collector-Intake System for VLEO Air-Breathing Platforms (Damien Le Quang, Von Karman Institute)	High Enthalpy Testing of UHT-CMC Materials for Space Application (Burkard Esser, DLR)	Numerical Simulation of Transpiration Cooling with a Two-Dimensional Substructure (Imran Naved, University of Oxford)	The Future of Hypersonic Flight in Europe: Open discussion Bayindir Saracoglu VKI; Francesco Morsillo SITAEL; Fulvio Spaziani Brunella AVIO ELV; Helmut Ciezki DLR; Jim Merrifield FGE; Johan Steelant ESA; Marc Vales DASSAULT; Marco Marini CIRA; Mariano Sanchez Nogales DEIMOS; Philippe Tran ARIANE GROUP; Rodrigo Haya Ramos SENER; Thilo Kranz ESA; Tiago Pardal OMNIDEA
11:10	COFFEE BREAK				
	Session 3.6 - Aerothermodynamics	Session 3.7 - (Re)-Entry and Aero-Assisted Vehicles	Session 3.8 - Thermal Protection Systems TPS	Session 3.9- Engineering Software Tools and Testing Facilities	Session 3.10 - Workshop on Technology Roadmaps to target Reusability
ROOM	Torre Cintola/Sala Cupola	Levante	Primo Piano (L)	Primo Piano (S)	Saletta meno uno
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11:30	Measurements of Radiating Hypervelocity Air Shock-Layers In the T6 Aluminium Shock Tube (Peter Collen, University of Oxford)	Space Rider Mission Engineering (Davide Bonetti, DEIMOS Space S.L.U.)	Transpiration Cooling At Mach 5 Employing Porous UHTC (Hassan Saad Itti, University of Oxford)	Hypersonic Flow Simulation Using Lattice Boltzmann Method - A Feasibility Assessment Study (Thibaut Van Hoof, CENAERO)	Part 3 – Facing the Challenges of Reusability FLPP Reusable technologies (J. Bru, ESA)
11:50	Modeling Hydrogen Ionization In Hypersonic Shock Tube: the Self-Consistent State-To-State Approach (Gianpiero Colonna, CNR)	Challenges and Innovations In the Guidance, Navigation, and Control Sys-Tem for Entry, Descent and Landing of Nasa'S Mars 2020 Mission (Paul Brugarolas, California Institute of Technology)	Characterisation of Internal Heat Transfer Mechanisms In Transpiring Porous Media Using Optical Diagnostics (Kharthik Chakravarthy, University of Oxford)	Determination of Dynamic Derivatives of Re-Entry Vehicles Using Unsteady Cfd Simulations (Jan Vos, CFS Engineering)	Reusability – From a Propulsion Point of View (H. Ciezki, DLR)
12:10	Thermodynamic and Transport Properties of Silicon-Seeded Air Plasmas (Gianpiero Colonna, CNR)	On Orbit and Re-Entry Services Performed By Space Drones (Stefania Cantoni, CIRA)	Studying the Film Effectiveness of Transpiration Cooled Walls Using Pressure Sensitive Paint (MarcEwenz Rocher, University Of Oxford)	Multi-Disciplinary Vehicle Design Based On the Tools ASTOS and ESPSS (Andreas Wiegand, Astos Solutions GmbH)	THEMIS as a Reusable Launcher (J. Vila, ArianeWorks)
12:30	An ES-BGK Model for Rarefied Polyatomic Perfect Gases With Vibrational Relaxation (Yann Dauvois, CEA)	Evaluation of Destruction Criteria During Atmospheric Re-Entry Simulation (Bent Fritsche, Htg- Hyperschall Technologie Göttingen)	Determining the thermal Response of A Flexible TPS In A High Enthalpy Environment (Emma Johnstone, Fluid Gravity Engineering Ltd)	Validation of Wind Tunnel Test and CFD Techniques for Retro-Propulsion (Retpro) Within the FLPP (Daniel Kirchheck, DLR)	An updated Database Architecture to Support New Launchers Programmes (R. Fusaro, POLITO)
12:50		Performance Evaluation of A Dual-Mode Scramjet Combustor With Jet Fuel (Masahiro Takahashi, JAXA)	Probabilistic Risk Analysis and Margin Process for A Flexible thermal Protection System (Steven Tobin, NASA)		Reusability - Main Technical Challenges: Open Discussion Alessandro Gabrielli ASI; Francesco Morsillo SITAEL; Fulvio Spaziani Brunella AVIO ELV; Gerrie Mullen REACTION ENGINES; Helmut Ciezki DLR; Jerome Vila ARIANE WORKS; Jim Merrifield FGE; Manuel Sanjurjo Rivo U. CARLOS III; Marc Vales DASSAULT; Marco Marini CIRA; Mariano Sanchez Nogales DEIMOS; Philippe Tran ARIANE GROUP; Rodrigo Haya Ramos SENER; Thilo Kranz ESA; Tiago Pardal OMNIDEA; Ulf Palmnäs ADVISOR TO SSC
13:10	LUNCH				
ROOM	PLENARY SESSION – Torre Cintola / Sala Cupola				
14:30	PLENARY ROUND TABLE: Space Ports and Commercial Space Transportation D. Nicolini, (ESA), E. Odd Roger (ANDOYASPACE), U.Palmnäs (ESRANGE), Jorge A. Pardo (INTA), F. Morsillo (SITAEL), L Apolloni (CNES), M. Sanchez (Deimos), M. A. Bello-Mora (Deimos), S. Hammond (Shetland Space Centre), A. Gabrielli (ASI), A. Cramarossa (ASI), G. Di Antonio (ENAC), A. Zilli (Distretto Tecnologica Aerospaziale DTA)				
16:00	COFFEE BREAK				
	Session 3.11 - Aerothermodynamics	Session 3.12 - (Re)-Entry and Aero-Assisted Vehicles	Session 3.13 - Design for Demise and Clean Space	Session 3.14 - Testing Facilities, Verification and Validation Methods	Session 3.15 - Workshop on Technology Roadmaps to target Reusability
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16:20	Predicting Acoustic Loads With Direct CFD On GPUs (Oliver Gloth, enGits GmbH)	Boundary Layer Transition Studies On the Hexafly-Int Hypersonic Glide Vehicle (Alexander Wagner, DLR)	Plasma Wind Tunnel Demisability Testing of Spacecraft Equipment (James Beck, Belstead Research)	Aerothermal Characterization Data of Comars+ In L2K Martian Flow Environment (Lars Steffens, DLR)	Skylon Project (G. Mullen, REL)
16:40	Aerodynamic Characterization of Space Debris In the Vki Longshot Hypersonic Tunnel Using A Free-Flight Measurement Technique (Guillaume Grossir, Von Karman Institute)	Experimental Study of A Hypersonic Glide-Type Vehicle and A Re-Entering Cubesat With the Hypersonic Rarefied Wind Tunnel Marhy (Romain Jousot, CNRS, ICARE)	Progress In Probabilistic Assessment of Destructive Entry (James Beck, Belstead Research)	Pre-Commissioning Work for Reflected Shock Mode in the Oxford T6 Stalker Tunnel (Suria Subiah, University of Oxford)	Case study 2: Roadmap for a Reusable SSTO (R. Fusaro, POLITO)
17:00	Aerodynamic Testing of the Skylon Spaceplane (Andrew Hyslop, University of Oxford)	Modelling Capsule Stability Accounting for Shape Change (Dominik Neeb, DLR)	Aerothermodynamic Assessment of Atmospheric Emissions From Re-Entry Demise (James Beck, Belstead Research)	Test Facility To Investigate Plume-Regolith Interactions (Hossein Zare-behtash, University of Glasgow)	Reusability - Main Operational Challenges: Open Discussion Alessandro Gabrielli ASI; Francesco Morsillo SITAEL; Fulvio Spaziani Brunella AVIO ELV; Gerrie Mullen REACTION ENGINES; Helmut Ciezki DLR; Jerome Vila ARIANE WORKS; Jim Merrifield FGE; Manuel Sanjurjo Rivo UNIVERSITY CARLOS III; Marc Vales DASSAULT; Marco Marini CIRA; Mariano Sanchez Nogales DEIMOS; Philippe Tran ARIANE GROUP; Rodrigo Haya Ramos SENER; Tiago Pardal OMNIDEA; Ulf Palmnäs ADVISOR TO SSC
	Session 3.16 - Aerothermodynamics	Session 3.17 - (Re)-Entry and Aero-Assisted Vehicles	Session 3.18 - Design for Demise and Clean Space	Session 3.19 - Aerothermodynamics	Session 3.20 - Workshop on Technology Roadmaps to target Reusability
ROOM	Torre Cintola/Sala Cupola	Levante	Primo Piano (L)	Primo Piano (S)	Saletta meno uno

Chairpersons	Adam Okninski (Polish Institute of Aviation) Matthias Holzwarth (ArianeGroup) Stein Lemmens (ESA)	Alejandro Miguel San Martin (JPL) Kazuhisa Fujita (JAXA) André Fueser (ArianeGroup)	Stein Lemmens (ESA) Antonio Caiazzo (ESA)	Bernd Helber (VKI) Jim Merrifield (Fluid Gravity) Mariano Sanchez Nogales (Deimos Space)	Jorgen Bru (ESA) Victor Fernandez Villace (ESA) Nicole Viola (POLITO)
17:20	EHD and MHD Effects In Modification of Supersonic and Hypersonic Rarefied Flows for Reentry Applications (Romain Jousot, CNRS, ICARE)	Investigation of Ideal Magnetic Configurations for Advanced Reentry Control (Matthew Austin, Florida Institute of Technology)	Assessment of the Re-Entry Casualty Risk From Small Launcher Upper Stages (James Beck, Belstead Research)	Numerical Investigations of Charring Material Demisability In Atmospheric Entry Conditions (Pierre Schrooyen, CENAERO)	Part 4 – Future STEPS Upcoming Developments (R. Fusaro and N. Viola, POLITO)
17:40	Reduced-Order Kinetics and Radiation Modeling In Hypersonic Entries With US3D (Bruno Lopez, UIUC)	Monte Carlo Simulation of Aerocapture Trajectories for Small Science Missions At Venus, Mars, and Neptune Orbiter Missions (William Strauss, JPL)	Ground Testing Strategy for Space Debris Demise (Andrea Fagnani, Von Karman Institute)	Non-Catalytic Assessment and Blunt Body Stagnation Flow Replication In A Shock Tube (Yosheph Yang, Korea Advanced Institute of Science and Technology)	Final Discussion and Conclusions <i>(All, moderated by V. Fernandez, ESA)</i> <i>Fulvio Spaziani Brunella AVIO ELV; Helmut Ciezki DLR; Jim Merrifield FGE; Manuel Sanjurjo Rivo UNIVERSITY CARLOS III; Marc Vales DASSAULT; Marco Marini CIRA; Mariano Sanchez Nogales DEIMOS; Rodrigo Haya Ramos SENER; Tiago Pardal OMNIDEA</i>
18:00	How To Build Coarse-Grain Models Consistent From the Kinetic To Fluid Regimes (Thierry Magin, Von Karman Institute)	Heat-Shield Shape-Change Effects On Aerodynamic and Stability Characteristics of Re-Entry Capsules (Alessandro Turchi, Von Karman Institute)		Simulation of Unsteady Effects On Shock Speed In A Shock Tube (Matthew Satchell, the University of Oxford)	
18:20	END OF DAY 3				
19:00 23:30	Gala Dinner at the "Abazzia di San Lorenzo, Fasano" KEYNOTE SPEECH: Space Bussines Opportunities in the Apulia Region Giuseppe Aciermo (President of DTA) and Michele Emiliano (President of Apulia Region)				
Thursday 3rd October 2019					
ROOM	PLENARY SESSION – Torre Cintola / Sala Cupola				
8:30	KEYNOTE SPEECH: Enabling Entry Technologies for Robotic Science and Human Missions in the coming decades (Don Ellerby, NASA)				
	Session 4.1 - Aerothermodynamics	Session 4.2 - (Re)-Entry and Aero-Assisted Vehicles and Aerothermodynamics	Session 4.3 - Design for Demise and Clean Space	Session 4.4 - Multidisciplinary and Multi-physics Vehicle Design	
ROOM	Torre Cintola/Sala Cupola	Levante	Primo Piano (L)	Primo Piano (S)	Saletta meno uno
Chairpersons	Don Ellerby (NASA) Kazuhisa Fujita (JAXA) Burkard Esser (DLR)	Marcello Amato (CIRA) Thomas Reimer (DLR) Jean-Marc Bouilly (ArianeGroup)	Stein Lemmens (ESA) Antonio Caiazzo (ESA)	Johann Bals (DLR) Tiago Pardal (Omnidea) Sven Weikert (ASTOS)	
9:10	Diagnostics of Expansion Tube Flows By Laser Absorption Spectroscopy (Makoto Matsui, Shizuoka University)	European Flexible Heat Shields: Advanced TPS Design and Tests for Future In-Orbit Demonstration (EFESTO) (Davide Bonetti, DEIMOS Space S.L.U.)	Metallic Alloy and CFRP Demise Ablation Tests In the VKI Inductively-Coupled Plasmatron (Bernd Helber, Von Karman Institute)	Multi-Disciplinary and Multi-Fidelity Evaluation of VYVL and VTHL Reusable Launch Vehicle System Dynamics and Control (Låle Evrim Briese, DLR)	
9:30	Spatially Resolved Electron Density Measurement In Front of Shock Layer By Laser Interferometer (Makoto Matsui, Shizuoka University)	Measurement of Dynamic Stability of Earth Return Capsules In Low Supersonic and Transonic Conditions Using Balloon Tests (John Underwood, Vorticity Ltd)	Multiscale Heating Correlations Applied To Destructive Entry Methodologies (Jim Merrifield, Fluid Gravity Engineering Ltd)	Free-Flight CFD Simulations Ballistic Range and Flight Tests (Michael Barnhardt, Analytical Mechanics Associates)	
9:50	Coupled CFD Material thermal Response Analysis of A Cube At Simulated Wind-Tunnel and Flight Conditions (Jim Merrifield, Fluid Gravity Engineering Ltd)	Supersonic Parachute Testing Using A Maxus Sounding Rocket Piggy-Back Payload (John Underwood, Vorticity Ltd)	Study On the Demisability of Optical Payloads (Jim Merrifield, Fluid Gravity Engineering Ltd)	Robust Multi-Objective Optimisation of A Descent Guidance Strategy for A TSTO Spaceplane (Christie Maddock, University of Strathclyde)	
10:10	Molecular Beam Studies of Carbon and Silicon Carbide Ablation By Atomic Oxygen (Tom Schwartzentruber, Montana State University)	Mini-IRENE Flight Experiment – Stepwise Qualification Approach of A Deployable and Flexible Heat Shield for An Orbital Re-Entry Mission (Paolo Vernillo, CIRA)	Concepts and Considerations for Re-Entry Experiments To Inform Fragmentation Prediction for Destructive Entry (Jim Merrifield, Fluid Gravity Engineering Ltd)	Modern Techniques and Technologies for Space Flight Vehicle Engineering (Guillermo Ortega, ESA)	
10:30	Application of Particle-Based Continuum Methods To A Hypersonic Flow With Shock/Shock Interaction Around A Double Cone (Paul Nizenkov, boltzplatz - Numerical Plasma Dynamics)	The Importance of Bow Shock Adaption In CFD Simulations for Hypersonic Flows (Jan Vos, CFS Engineering)	Demisability of Novel Bio-Composite Material Under Experimentally Simulated Uncontrolled Re-Entry Conditions (Adam Pagan, University of Stuttgart)	Space Rider - Aerodynamics and Aerothermodynamics from hypersonic to subsonic flight (Olivier Lambert, Dassault-aviation)	
10:50	Translational Temperature Measurements of CO2 Flow In Expansion Tube (Satoshi Nomura, JAXA)	Nonequilibrium Dissociation Model for Hypersonic Flow Based On Computational Chemistry (Tom Schwartzentruber, University of Minnesota)	An ESA study on Design for Demise certification (Orr Cohen, ESA)	Effect of Ablation Shape Change In Transonic and Subsonic Aerodynamics for A High Speed Entry Capsule (Jorge Sancho, SENER)	
11:10	COFFEE BREAK				
	Session 4.5 - Aerothermodynamics	Session 4.6 - Aerothermodynamics	Session 4.7 - Aerothermodynamics and Testing	Session 4.8 - Flight Data Exploitation	
ROOM	Torre Cintola/Sala Cupola	Levante	Primo Piano (L)	Primo Piano (S)	Saletta meno uno
Chairpersons	Don Ellerby (NASA) Kazuhisa Fujita (JAXA) Burkard Esser (DLR)	Marcello Amato (CIRA) Thomas Reimer (DLR) Jean-Marc Bouilly (ArianeGroup)	Fabio Pinna (VKI) Jim Merrifield (Fluid Gravity) Mariano Sanchez Nogales (Deimos Space)	Manuel Sanjurjo Rivo (University Carlos III) Tiago Pardal (Omnidea) Sven Weikert (ASTOS)	
11:30	Modeling Heatshield Erosion Due To Dust Particle Impacts for A Martian Entry Vehicle (Grant Palmer, Ama, Inc.)	Thermodynamic Analysis of Boundary Layer Species During Ablation (Maitreyee Sharma Priyadarshini, University of Illinois, Urbana-Champaign)	IXV Flight Catalysis Determination In Inductively Coupled Plasma Facility (Alan Viladegut, Von Karman Institute)	Aerodynamic Database Development for A Future Reusable Space Launch Vehicle, the Orbital 500R (Tristan Stindt, Fluid Gravity Engineering)	
11:50	Construction of an Ab-Initio Based Non-Equilibrium Chemistry Model for Air Mixtures (Marco Panesi, University of Illinois at Urbana Champaign)	State-Resolved Transport for the O+O2 System Based On Ab Initio Potential Energy Surface Analysis (Kelly Stephani, University of Illinois At Urbana-champaign)	Hypersonic Boundary Layer Instability Measurements at Mach 7 and Flight Total Enthalpy (S. Wylie, University of Oxford)	Analysis of the AEDB Performance During the Exomars Schiaparelli Descent (Emma Johnstone, Fluid Gravity Engineering Ltd)	
12:10	Radiative Attenuation Through Heat Shield Doping: A Multi-Scale Approach From Ab Initio To CFD (Marco Panesi, University of Illinois at Urbana Champaign)	Experimental Radiation Measurement From CO2 Flow In Shock Tube and Expansion Tube (Hiroki Takayanagi, JAXA)	European Shock-Tube for High Enthalpy Research: Design and Instrumentation, Manufacturing, and Acceptance Testing (M. Lino da Silva, Universidade de Lisboa)	Exploitation of Flight Data From Balloon Drop Tests for Earth Return Capsules (Emma Johnstone, Fluid Gravity Engineering Ltd)	

12:30	A Stability Based Transition Prediction Criterion for Up To Mach 8 Hypersonic Flows (Jean Perraud, ONERA)	Force Measurement Comparison of Blunt Cones In High-Enthalpy Shock Tunnel Heg and Hiest (Hideyuki Tanno, JAXA)	Simulation of Exhaust Plumes in Rarefied Atmosphere (A. Award, ONERA)	Analysis of the Aerothermal and Material Performance During the Exomars Schiaparelli Descent (Emma Johnstone, Fluid Gravity Engineering Ltd)	
12:50	Experimental Characterization of the Hypersonic Flow Around Cubes (Thomas Rees, Imperial College London)	Aerothermodynamic and Trajectory Studies On Optimal Earth Re-Entry of A Capsule (Fabian Teschner, University of the Bundeswehr Munich)	Preliminary Design of an Origami Foldable De-orbiting Sail for a 3U CubeSAT (C. Vendittozzia, Universidade de Brasilia)	Numerical Computation of the Exomars Schiaparelli Communications Blackout Compared With Flight (Tristan Stindt, Fluid Gravity Engineering)	
13:10 ROOM	LUNCH				
PLENARY SESSION – Torre Cintola / Sala Cupola					
14:30	PLENARY ROUND TABLE: The Upcoming Exploration of the Moon				
	A. Casell (NASA), B. Foing (ESA), S. Schleichriem (DLR), F. Liucci (ESA), P. Bousquet (CNES), J. Merrifield (Fluid Gravity Engineering), J. Van Tooren (Arianegroup)				
16:00	COFFEE BREAK				
	Session 4.9 - Aerothermodynamics	Session 4.10- Aerothermodynamics	Session 4.11 - Deployable Aeroshells	Session 4.12 - Flight Data Exploitation	
ROOM	Torre Cintola/Sala Cupola	Levante	Primo Piano (L)	Primo Piano (S)	Saletta meno uno
Chairpersons	Don Ellerby (NASA) Kazuhisa Fujita (JAXA) Burkard Esser (DLR)	Marcello Amato (CIRA) Thomas Reimer (DLR) Jean-Marc Bouilly (ArianeGroup)	Thierry Magin (VKI) Marc Vales (Dassault)	Manuel Sanjurjo Rivo (University Carlos III) Adam Okninski (Polish Institute of Aviation) Matthias Holzwarth (ArianeGroup)	
16:20	Modelling and Simulation of Heterogeneous Reactions With Statistical Particle Methods (Wladimir Reschke, University of Stuttgart)	Direct Molecular Simulation of Dissociating Oxygen In 0D Adiabatic Reactor (Erik Torres, University of Minnesota)	European Studies To Advance Development of Deployable and Inflatable Aerodynamic Decelerators (John Underwood, Vorticity Ltd)	Overview of the Test-Flights of the KRUPS Capsule (Alexandre Martin, University of Kentucky)	
16:40	CFD Computations of Orbital and Super-Orbital Re-Entry Heating On Primitive Shapes (Jeroen Van Den Eynde, ESA)	Comparison of Chemical Modeling for High-Temperature Gas Effects With Direct Numerical Simulations of Roughness-Induced Transition In A Re-Entry Scenario of A Hemispherical Capsule (Friedrich Ulrich, Technical University of Munich)	Flight Demonstration of Deployable Aeroshell Technology Using Nano-Satellite Opportunity (Kazuhiko Yamada, JAXA)	Flight Data Analysis of the Multicolor Imaging Pyrometry Experiment On Esa'S Intermediate Experimental Vehicle IXV (Thomas Roesgen, ETH Zurich)	
PLENARY SESSION – Torre Cintola / Sala Cupola					
17:00	CONFERENCE CLOSURE (G. Ortega, ESA)				
18:00	END OF DAY 4				