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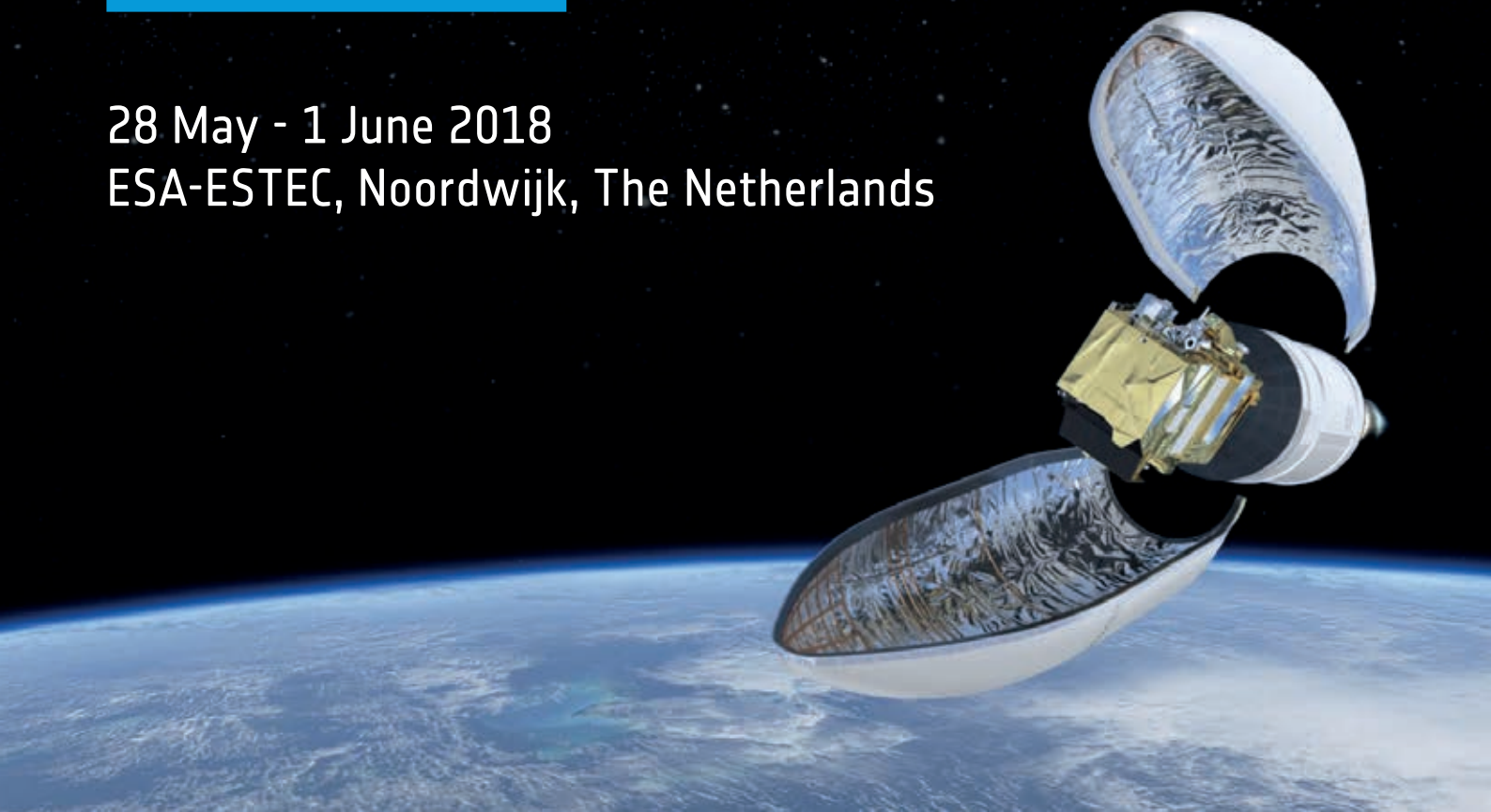
15TH EUROPEAN CONFERENCE ON SPACECRAFT STRUCTURES, MATERIALS AND ENVIRONMENTAL TESTING

28 May - 1 June 2018
ESA-ESTEC, Noordwijk, The Netherlands



15TH EUROPEAN CONFERENCE ON SPACECRAFT STRUCTURES, MATERIALS AND ENVIRONMENTAL TESTING

Day 1 - Monday 28 May 2018

09:00 - 13:00	**REGISTRATION WINTERGARDEN**	
13:00 - 14:00	**WELCOME AND INTRODUCTION SESSION**	
14:00 - 15:30	**KEYNOTES**	
	Keynote 1 **Forty years of satellite and launcher mechanical experiences** *Prof. Dr. C. Stavrinidis, Technical Director, IABG* **Keynote 2** **How to build more and more competitive and still robust Verification Plans for Structures** *Silvain Legrand, Mechanical Expert in the Technical Authorithy of the Competence Center Platform & Integration, Thales Alenia Space* **Keynote 3** **Mechanical System Testing on a Launcher Upper Stage** *Detlev Bülten, Team Leader "Dynamic & Testing" Mechanical Engineering, ArianeGroup*	
15:30 - 16:00	**BREAK**	
	NEWTON 1	**NEWTON 2**
16:00 - 18:30	**Spacecraft Design Architecture**	**Launcher Structures**
	Chair: G. Kling - P. Martimort	**Chair: P. Mourey - T. Ghidini**
16:00 - 16:30	**S2TEP - A New Scalable Satellite Platform** *S. Reershemius[1], T. Spröwitz, M. Jetzschmann, F. Dannemann* *[1]German Aerospace Center (DLR), Germany*	**Airbus DS Ariane 6 Structures** *A. Sanchez[1]* *[1]Airbus Defence & Space Spain, Spain*
16:30 - 17:00	**MetOp-SG ICI Mechanical Architecture** *D. Sanchez-Pascuala Valencia[1]* *[1]Airbus Defence & Space, Spain*	**New CFRP Basin Bulkhead Concept for Ariane 6: Shape Optimization** *M. G. Cosío[1], J. Martín[2], M. Angel Alen[1]* *[1]Citd Engineering & Technologies, Spain,* *[2]Airbus D&S, Spain*
17:00 - 17:30	**Novel CFRP Stable Structure for Sentinel 5 UVNS Optical Instrument** *S. Lucarelli[1], M. Pellizzari [1], D. Matias Boveda[1], D. Ende[1], G. Laduree[2]* *[1]Airbus Defence And Space, Germany,* *[2]ESA-ESTEC, The Netherlands*	**Development and Validation of a Composite Solid Rocket Motor Case** *M. Wolff* *[1]MT Aerospace AG, Germany*

REGISTRATION WINTERGARDEN		
BREAK		
EINSTEIN	**ERASMUS**	**ESCAPE**
Acoustic Testing	**Additive Manufacturing System Aspects**	
Chair: A. Kolaini - S. Scharfenberg	**Chair: K. Pfaab - L. Pambaguian**	
Direct Field Acoustic Testing in Space Industry Facility *C. Fabries[1], B. Brevart[1], N. Saggini[2], A. Ciriello[2]* *[1]Thales Alenia Space, France, [2]Thales Alenia Space, Italy*	**Development and Test of a Three and an Half Space Applications Using Additive Manufacturing Technologies** *P. Bigot[7], C. Borbouse[4], A. Chiavarini[3], E. Chouteau[5], Y. Garin[3], A. Heck[4], L. Jacques[2], I. Liemans[6], F. Montredon[5], L. Pambaguian[1], JY. Plesseria[2]* *[1]ESA-ESTEC, Netherlands, [2]Centre Spatial de Liège, Belgium, [3]Lambda-X, [4]Safran AB, [5]Thales Alenia Space, France, [6]Thales Alenia Space, Belgium, [7] [3]D-Systems*	
Pre-Test Analysis for Design of MIMO Control Strategies on DFAX *M. Alvarez Blanco[1],[2], K. Janssens[1], A. Carrella[1], B. Peeters[1]* *[1]Siemens Industry Software NV, Belgium, [2]KU Leuven, Belgium*	**Systems Engineering and Systems Architecting Approaches For Innovative Additive Manufactured Spacecraft Structures** *L. Pollice[1], M. Gschweitl[2], R. Usinger[2], P.Gaudenzi[1]* *[1]Sapienza University Of Rome, Italy, [2]RUAG Space, Switzerland*	
Acoustic Test Definition for Satellite Antenna Feed Qualification *B. Brevart[1], B. Boury[1], B. Butul[1], M. Heim[2]* *[1]Thales Alenia Space, France, [2]Centre National d'Etudes Spatiales, France*	**Issues for Design, Modelling and Laser Beam Manufacturing of Structures Including Aluminium Micro-Lattices** *G. Pommatau[1], M. Raynaud[1], K. Cabannes[1], F. Montredon[1], K. Brethome[3], B. Bonvoisin[2], M. Komarek[4], N. Sordello[5]* *[1]Thales Alenia Space, France, [2]ESA-ESTEC, The Netherlands, [3]CNES, France, [4]LKE, Czech Republic, [5]Mecano ID, France*	

17:30 - 18:00	**Structural Design Advantages of High Performance Radiators (HiPeR)** *S. Carli[1], A. Allgaier[1], M. Altenburg[1], A. Chiri[1], B. Maria Guitard Lejarreta[1], V. Hoefig[1], S. Lucarelli[1], A. Maas[2], D. Sausen[1], J. Truenkle[1], S. Olga Vismara[1], P. Weimer[1], J. Wingens[1], C. Wuehrer[1]* *[1]Airbus Defence & Space GmbH, Germany, [2]Airbus Defence & Space Netherlands B.V., The Netherlands*	**Ariane 6 VINCI Thrust Frame** *M. Brooker[1], H. Meijer[1], P. van Schie[1]* *[1]Airbus Defence & Space Netherlands, Netherlands*
18:00 - 18:30		**CALLISTO Project – Structural Design and Sizing Challenges in the Frame of a Reusable First Stage Demonstration Vehicle** *O. Diaz Lopez[1]* *[1]CNES, France*
18:30 - 21:00	**COCKTAIL SPACE EXPO**	

Day 2 - Tuesday 29 May

	NEWTON 1	NEWTON 2
08:30 - 10:30	**Micro-Vibration Characterisation**	**Deployable Structures - 1**
	Chair: P. Corberand - M. Wagner	**Chair: C. Hühne - A. Ihle**
08:30 - 09:00	**The Spacecraft Micro-Vibration Management and Control Problem: A Survey of Architectures, Isolation Technologies, Modeling, and Testing Approaches** *C. Dennehy[1], O. Alvarez-Salazar[2]* *[1]NASA Goddard Space Flight Center, United States, [2]Jet Propulsion Laboratory (JPL))/California Institute of Technology, United States*	**An Overview of the Mechanisms and Deployables on the Removedebris ADR Mission** *G. Aglietti[1], J. Forshaw[1], A. Viquerat[2], B. Taylor[1]* *[1]Surrey Space Centre / University Of Surrey, United Kingdom, [2]Mechanical Engineering Dept / University Of Surrey, United Kingdom*
09:00 - 09:30	**Recent Developments in Micro Vibrations Measurements** *E. Cavro[1], P.-E. Dupuis[1], F. Vidal-Mata[1], M. Privat[2]* *[1]Airbus Defence and Space, France, [2]CNES, France*	**The ADEO Passive De-Orbit Subsystem Proto Flight Model: Reference Missions & PFM Design** *T. Sinn[1], L. Tiedemann[1], A. Riemer[2], R. Hahn[2], T. Sproewitz[3], P. Seefeldt[3], M. Sznajder[3], S. Reershemius[3], S. Meyer[4], M. Zander[4], K. Dietrich Bunte[5], S. Weikert[6], A. Wiegand[6], T. Cardone[7], D. Teti[7]* *[1]HPS GmbH, Germany, [2]HTS GmbH, Germany, [3]DLR German Aerospace Center - Institute of Space Systems, Germany, [4]DLR German Aerospace Center - Institute of Composite Structures and Adaptive Systems, Germany, [5]Etamax Space GmbH, Germany, [6]Astos Solutions GmbH, Germany, [7]ESA-ESTEC, The Netherlands*

Acoustic Test Predictions and Correlation for the SGEO Satellite Platform PFM Model *B. Martínez-Calvo[1], N. Riva[1], H. Segelke[1]* *[1]OHB System AG, Germany*	**ALM Structures Design Process Development** *T. Benedicto Rinaudo[1], R. Caujolle[1], S.Roger[1]* *[1]Airbus Defence & Space, France*	
Acoustic Test Data Analysis & Signal Processing *A. Kiley[1], E. Collavo[1], G. Labruyere[2], G. Rodrigues[2], M. Such[2]* *[1]Airbus Defence & Space, United Kingdom, [2]ESA-ESTEC, Holland*	**Development and Test of a Two-Mirror Telescope Using Additive Manufacturing Technology** *M. Thiel[1], T. Sedlmaier[1], J.-B. Volatier[1], L. Pambaguian[2], S. Brinkers[3], W. Crowcombe[3], H. Oosterling[3], F. van Kempen[3], A. Hoogstrate[3], P. Kerkhof[3], C. Aumund-Kopp[4], .M. Mulser[4], G. Hilfer[5], S. Klein[5], T. Hayo[5], T. Domagala[6], S. Kwast[7], M. Eggens[7]* *[1]OHB System AG, Germany, [2]ESA-ESTEC, Netherlands, [3]TNO, Netherlands, [4]Fraunhofer IFAM, Germany, [5]IABG, Germany, [6]Materialise, Germany, [7]SRON, Netherlands*	
COCKTAIL SPACE EXPO		

EINSTEIN	ERASMUS	ESCAPE
Acoustic Analysis - 1	**Additive Manufacturing - Design 1**	
Chair: N. Riva - I. Ngan	**Chair: S. Legrand - A. Makaya**	
Investigating Diffusivity of Virtual Diffuse Field Acoustic Test (DFAT) Using Boundary Element Modeling and Wavenumber-Frequency Analysis *B. Gardner[1], A. Castel[2], C. Musser[1], A. Medeiros[1], L.Alimonti[1]* *[1]ESI Group, United States, [2]ESI NA, United States*	**Design of a Gyroscope Support Structure Manufactured by Selective Laser Melting** *T Glaser[1], O, Mierheim[1], C. Hühne[1]* *[1]German Aerospace Center, Germany*	
Full Frequency Band Vibro-Acoustic Analysis of a Sandwich Composite Structure *A. Caillet[1], D.-O. Lee[2], Y.-K. Lee[2], A. Grillenbeck[3], T. Lechelmayr[3]* *[1]ESI Gmbh, Germany, [2]ADD, Republic of Korea, [3]Space Centre IABGmbH, Germany*	**Topology Optimisation of a PCB Supporting Frame** *I. Liémans[1], J. Garnier[1], J. Polome[1], D. Garray[2], S. Vermeir[2]* *[1]Thales Alenia Space in Belgium, Belgium, [2]Sirris, Belgium*	

09:30 - 10:00	**Test Facility for Microvibration Requirements Verification** *Mr Santiago Pasalodos[1], Mr Enrique del Castillo[1], Mr Marcos Ubierna[2], Mr Luis Pascual[1], Mr Jose Ignacio Bueno[2]* *[1]SENER, Spain*	**Gossamer Solar Array Concepts** *T. Sproewitz[1], P. Seefeldt[1], .C. Grimm[1], R. Jahnke[1], N. Reininghaus[3], K. Sasaki[1], M. Sznajder[1], P. Spietz[1], S. Reershemius[1], H. Martens[1], M. Hillebrandt[2], S. Meyer[2], N. Toth[1], M. Vehse[3], T. Wippermann[1], M. Zander[2], J.-T. Grundmann[1]* *[1, 2, 3]German Aerospace Center, Germany,*
10:00 - 10:30	**A Methodology for Disturbance Characterisation of Families of Microvibration Sources** *S. De Lellis[1], A. Stabile[1], G. S. Aglietti[1], G. Richardson[2]* *[1]University of Surrey, United Kingdom, [2]Surrey Satellite Technology Limited (SSTL), UK*	**An Engineering Investigation on Deployable Rigid Solar Array Inspired by Miura Origami** *M. Li, Q. Cui, L. Zhang* *[1]Aerospace System Engineering Shanghai, China*
10:30 - 11:00	**BREAK**	
	NEWTON 1	**NEWTON 2**
11:00 - 13:00	**Micro-Vibration Characterisation / Modelling / Isolation**	**Deployable Structures - 2**
	Chair: G. Aglietti - G. Smet	**Chair: O. Mierheim - M. Such Taboada**
11:00 - 11:30	**Investigation of Parameters Affecting the Microvibration Signature of Reaction Wheel Bearings** *C. Hodge[1], A. Stabile, G. Aglietti, A. Wade, G. Richardson* *[1]University Of Surrey, United Kingdom*	**Scalability of Stable Deployable Trusswork Mast** *C. Cardoso[1], J. Loureiro[1], I. Costa[1], L. Moreira[2], J. Rodrigues[2], C. Ashcroft[3], L. Puig[3]* *[1]HPS Lda, Portugal, [2]INEGI, Portugal, [3]ESA-ESTEC, Nederlands*
11:30 - 12:00	**Microvibrations Modelling and Measurement on Sentinel 4 UVN Calibration Assembly Using Piezoelectric 6 Component Force Dynamometers** *J. Cheret[1], J. Jacobs[2]* *[1]Kistler Instrument, Switzerland, [2]Centre Spatial de Liège, Belgium*	**Conceptual Design of the Deployable Booms for the GOSOLAR-Satellite** *M. Hillebrandt[1], M. Zander[1], C. Huehne[1]* *[1]Dlr - German Aerospace Center, Germany*
12:00 - 12:30	**Mechatronic Design of an Active Micro-Vibration Isolation Platform Utilizing Magnetic Levitation** *Z. Gong[1], L. Ding[1], H. Yue[1], F. Yang[1], R. Liu[1], P. Xu[1]* *[1]Harbin Institute Of Technology, China*	**Design and Inflatable Testing in Space for Gravity-Gradient Boom** *J. Wei[1]* *[1]Harbin Institute of Technology, China*
12:30 - 13:00	**Vibration Isolator for Cryogenic Machines** *G. Carte[1], T. Demerville[2]* *[1]Thales Alenia Space - France, France, [2]SMAC, France*	**Exploring the Behavior of Self-Deployable Composite Booms Using High Definition Fiber Optic Sensing** *N. A. Abdul Rahim[1], K. Cox[2], M. Davis[1]* *[1]Luna Innovations, United States, [2]Roccor, United States*
13:00 - 14:00	**LUNCH**	

Assessment on Acoustic Test Effectiveness in Reverberant Chamber via Analysis by Wave Number Transform on Normalized Cross Spectrum Density *D. Todaka[1]* *[1]Japan Aerospace Exploration Agency, Japan*	**Bio-inspired Bracket in Additive Manufacturing: Umbilical Connector Bracket** *G. Cosío M[1], Vilanova J[2], Lasagni F[3]* *[1]Citd Engineering & Technologies, Madrid, Spain, [2]Airbus D&S, Madrid, Spain, [3]CATEC, Sevilla, Spain*	
Acoustic Analysis of Structures with Local Nonlinear Behaviour *C. Puillet[1]* *[1]CNES, France*	**Innovative Microsatellite Design Using Additive Manufacturing and Optimization Technics for its Structure** *L. Ruiz De Ocenda[1], A. Piquereau[1], K. Pfaab[1], B. Millord[2]* *[1]Cnes, France, [2]SOGECLAIR Aerospace, France*	
BREAK		
EINSTEIN	**ERASMUS**	**ESCAPE**
Acoustic Analysis -2	**Additive Manufacturing - Process**	
Chair: Q. Shi - N. Eaton	**Chair: G. Pommatau - L. Pambaguian**	
Recovering Output from Vibro-Acoustic Analyses Containing Condensed Models *A. Vargalui[1], I. Ngan[1]* *[1]ESA-ESTEC, Netherlands*	**Impact of LBM Process Defects on Mechanical Properties of AS7G06 Aluminium Alloy** *O. Quenard[1], P. Guy[1], S. Begoc[2]* *[1]Icam, France, [2]CNES, France*	
Efficient Matrix Randomisation Methodology for Reduced Spacecraft Models in Stochastic FEM-BEM Vibroacoustic Problems *V. Yotov[1], M. Remedia[1], G. Aglietti[1], G. Richardson[2]* *[1]Surrey Space Centre, United Kingdom, [2]Surrey Satellite Technology Ltd., United Kingdom*	**In-Situ Process Monitoring in Metal Powder Bed Fusion Processes by Means of Multi-Sensor Data Mining Methods** *M. Grasso[1], B. Maria Colosimo[1]* *[1]Politecnico Di Milano, Italy*	
Analysis of IXV Space Hardware Exposed to Acoustic Diffuse Random Field *S. Destefanis[1], A. Talbot[2]* *[1]Thales Alenia Space Italy, Italy, [2]Free Field Technologies, Belgium*	**Silicon Nitride Ceramic Development for Disruptive Space Applications** *N. Rousselet[1], S. Schweizer[1], P. Grasset[2], K. Brethome[3]* *[13]DCeram, France, [2]Thales Alenia Space, France, [3]CNES, France*	
Comparison of Stress Evaluation Approaches under Acoustic Loads *R. Olympio[1], V. Mariathasan[1]* *[1]Airbus Defence And Space, Germany*	**Realization of Smart Components with Embedded Electronics by using Fused Filament Fabrication** *G. Graterol Nisi[2], M. Eugeni[1], V. Cardini[1], S. Atek[2], M. Pasquali[1], P. Gaudenzi[1]* *[1]Università Di Roma La Sapienza, Italy, [2]Smart Structures Solution, Italy*	
LUNCH		

	NEWTON 1	NEWTON 2
14:00 - 16:00	**Micro-Vibration Isolation / Control**	**Deployable Structures - 3**
	Chair: E. Standarovski - P. Gaudenzi	**Chair: E. Pfeiffer - D. Ljubicic**
14:00 - 14:30	**Characterisation of a Novel 2-Collinear-DoF Strut for Micro-Vibration Mitigation** *A. Stabile[1], G. S. Aglietti[1], G. Richardson[2], G. Smet[3] [1]Surrey Space Centre, United Kingdom, [2]Surrey Satellite Technology Ltd, United Kingdom, [3]ESA-ESTEC, Netherlands*	**Modular Deployable Structures Demonstrators** *J. Nieto[1], J. Fayos[1], Á. Pipó[2], C. Montesano[3], J. Santiago-Prowald[4] [1]Comet Ingeniería S.L., Spain, [2]Prosix Engineering, Spain, [3]Airbus D&S Space Systems España, Spain, [4]ESA-ESTEC, The Netherlands*
14:30 - 15:00	**Vibration Damping of TALC in the Deployed Configuration: an Experimental Demonstration on a 1/10 Test Bench** *C. Collette[1], A. Pece[1], G. Durand[2], S. Chesné[3] [1]Université Libre De Bruxelles, Belgium, [2]CEA Saclay, France, [3]INSA-Lyon, France*	**LAGARD: Breadboard Testing Towards an 11-Meter Deployable Stable Truss Structure** *D. E. Vlachos[1,2], D. Lamprou[1], A. I. Vavouliotis[1,2], A. Kotzakolios[1,2], F. Anagnostidis[1], V. Baras[1], E. C. Kaslis[2], V. Kostopoulos[2], L. Puig[3], C. Ashcroft[4] [1]Adamant Composites Ltd, Greece, [2]Applied Mechanics Laboratory, Mech. Engineering and Aeronautics Dept., Greece, [3]European Space Research and Technology Centre (ESA-ESTEC), The Netherlands, [4]European Space Research and Technology Centre (ESA-ESTEC), The Netherlands*
15:00 - 15:30	**Tuned Mass Dampers for Space Applications** *G. Carte[1], T. Demerville[2] [1]Thales Alenia Space, France, [2]SMAC, France*	**Tensegrity Diaphanous Dome Demonstrator** *J. Fayos[1], J. Nieto[1], Á. Pipó[2], J. Santiago-Prowald[3] [1]Comet Ingeniería S.L., Spain, [2]Prosix Engineering, Spain, [3]ESA-ESTEC, The Netherlands*
15:30 - 16:00	**Method of Adjusting the Resonant Frequencies by Placing Vibration Isolator Locations to Avoid Harmful Resonances below Cut Off Frequency** *T.Kajikawa[1], Y. Hyakusoku[1], D. Todaka[1], Q. Shi[1] [1]JAXA, Sengen, Japan*	**Deployment Characteristics of the Composite Parabolic Reflector with Zero-Gravity Test** *J. Roh[1], S. Ho Chae[1], Y.-E. Oh[1], S.-Y. Lee[1] [1]Korea Aerospace University, South Korea*
16:00 - 16:30	**BREAK**	
16:30 - 18:30	**Vibration Isolation / Damping**	**Deployable Structures - 4**
	Chair: G. Carte - R. Knockaert	**Chair: J. Nieto - M. Palladino**
16:30 - 17:00	**Hybrid Isolatior for Space Applications** *Lafarga Nebot V[1], Gadanho V[1], Zhao G[1], Rodrigues G[2], Collette C[1] [1]Université Libre De Bruxelles, Belgium, [2]ATG-Europe B.V, The Netherlands*	**Articulated Boom Development for Large Deployable Reflectors** *S. Endler[1], D. Hartmann[1], A. Riemer[2], T. Sproewitz[3], L. Carlos Moreira[4], A. Ihle[5] [1]HPS Gmbh, Germany, [2]HTS GmbH, Germany, [3]DLR, Germany, [4]INEGI, Portugal, [5]ESA-ESTEC, The Netherlands*

EINSTEIN	ERASMUS	ESCAPE
Static Testing	**Additive Manufacturing - Material Characterisation 1**	**WORKSHOP** **Direct Field Acoustic Testing** **14.00- 17.00**
Chair: J. Martin - R. Knockaert	**Chair: F. Bruckner - A. Brandao**	
Static Load Test Qualification of a Geostationary Spacecraft Primary Structure A. Nippe[1], G.Bianchi[1] [1]OHB System AG, Germany	**Study on the Effect of Temperature on the Mechanical Properties of Powder Bed Fused INCONEL 718** M. Sprengel[1], A. Baca[2], J. Gumpinger[2], A. Brandao[2], T. Ghidini[2] [1]ESA-ECSAT, United Kingdom, [2]ESA-ESTEC, The Netherlands	
Development and Qualification of the Primary Structure of Orion-MPCV European Service Module P. Palmieri[1], L. Rutigliano[1], S. Ottaviano[1], D. Mioche[2], G. Di Vita[3], L. J. Ghosn[4], T. L. Wallen[5] [1]Thales Alenia Space Italy, Italy, [2]Ariane Group, France, [3]ESA-ESTEC, The Netherlands, [4]NASA, USA, [5]Lockeed Martin Corporation (LMCO), USA	**Fatigue Properties and Material Characteristics of AM AlSi10Mg: Effect of the Contour Parameter on the Microstructure, Density and Mechanical Properties** E. Beevers[1], A. Brandão[1], J. Gumpinger[1], M. Gschweitl[2], C. Seyfert[3], T. Ghidini[1] [1]ESA-ESTEC, The Netherlands, [2]RUAG Schweiz AG, Switzerland, [3]EOS GmbH Electro Optical Systems, Germany	
Test-Model Correlation of an AFP Full-Scale Demonstrator P. Mas[1] [1]Ariane Group, France	**Structural Damping of Additively Manufactured Structures - LEROS Engine Support** M. Ferrari[1], M. Gschweitl[1], P. Stiles[2], N. Solway[2] [1]Ruag Schweiz Ag, Switzerland, [2]Nammo Westcott Ltd, United Kingdom	
Damage Detection in Structures Using a Force Identification Algorithm Based on Transmissibility N. Maia[1], M. Neves[1] [1]LAETA/IDMEC/instituto Superior Tecnico, Portugal	**Material Characterization of Additively Manufactured PA12 and Design of Multifunctional Satellite Structures** Hümbert S[1], Springer P[2], Lengowski M[3], Sakraker Özmen I[1], Gleixner L[1], Arce E[1] [1]Deutsches Zentrum Für Luft- Und Raumfahrt e.V., Germany, [2]Fraunhofer-Institut für Produktionstechnik und Automatisierung IPA, Germany, [3]Universität Stuttgart Institut für Raumfahrtsysteme (IRS), Germany	
BREAK		
Metrology for Spacecraft Testing	**Additive Manufacturing - Industrialisation**	
Chair: D. Veal - G. Casarosa	**Chair: T. Glaser - B. Bonvoisin**	
The Future of Spacecraft Metrology JT Janssen[1] [1]National Physical Laboratory, United Kingdom	**Mechanical Properties of Surface Engineered Metallic Parts Prepared by Additive Manufacturing** N. Stelzer[1], M. Scheerer[1], L. Baca[1], Z. Simon[1], T. Sebald[2], H. Gschiel[3], M. Hatzenbichler[3], B. Bonvoisin[4] [1]Aerospace & Advanced Composites Gmbh, Austria, [2]Ariane Group GmbH, Germany, [3]FOTEC Forschungs- und Technologietransfer GmbH, Austria, [4]ESA-ESTEC, The Netherlands	

17:00 - 17:30	**Elastomer Snubbers Sizing Aiming to Reduce the Dynamic Displacements of a Large Deployable External Appendage** *C. Rouzée[1], P. Camarasa[1]* *[1]Airbus Defence And Space, France*	**The Tape Spring Hinge Deployment System of the Eu:CROPIS Solar Panels** *O. Mierheim[1], T. Glaser[1], C. Hühne[1], C. Hobbie[2], S. Kottmeyer[2]* *[1]German Aerospace Center DLR, Germany, [2]German Aerospace Center DLR, Germany*
17:30 - 18:00	**Piezoelectric Shunt Damping of Space Telescopes Deformable Mirrors under Launching Loads** *D. Alaluf[1,2], B. Mokrani[3], K. Wang[1], A. Preumont[1]* *[1]Active Structures Laboratory - Université Libre de Bruxelles, Belgium, [2]ESA-ESTEC, The Netherlands, [3] Department of Mechanical, Materials and Aerospace Engineering - University of Liverpool, United Kingdom*	**Design and Analysis of Flexible Hinge Used for Unfolding Spacecraft Solar Panels** *J. Zhang, K. Yan, Z. Kou* *[1]Taiyuan University Of Technology, China*
18:00 - 18:30	**Determination of Optimum Vibration Isolator Properties for Payload Vibration Isolation** *B. Karaman[1], G. ÖZGEN* *[1]Roketsan, Turkey*	**Development of a Deployable Composite Helical Antenna** *Q. Chen[1]* *[1]Shanghai Ys Information Technology Co., Ltd., China*
18:30 - 20:30	**POSTER SESSION - 1**	

Day 3 - Wednesday 30 May

	NEWTON 1	NEWTON 2
8.30 - 10.30	**Shocks - 1**	**Vibration Testing**
	Chair: B. Brevart - S. Kiryenko	**Chair: A. Kommer - T. Glaser**
08:30 - 09:00	**Improvement of Shock Specification and Representativeness for Tests at Subsystem Level** *E. Niemczyk[1], J. D'Amico[1], S. Behar-Lafenêtre[1], E. Raynal[2], C. Puillet[2]* *[1]Thales Alenia Space, France, [2]Centre National des Etudes Spatiales, France*	**Spacecraft Equipment Testing: Methodology to Reduce Overtesting** *C. Knight[1], M. Remedia[1], G. S. Aglietti[1]* *[1]Surrey Space Centre, United Kingdom*
09:00 - 09:30	**Feedback from an Equipment Supplier on Shocks** *L. Jamot[1], E. Carrié[1], G. Marque[1]* *[1]Sodern, France*	**An Extended Mass Operator Method Within James-Web-Telescope Vibration Tests** *M. Jentsch[1], M. Schatz[1], R. Olympio[1], W. Konrad[1]* *[1]Airbus Defence And Space GmbH, Germany*
09:30 - 10:00	**Improved Pyrotechnic Shock Scaling Method Based on Shock Response Spectrum and Statistical Energy Analysis** *J. Ho-Jin Hwang[1], J. Fernandez[1], G. Borello[2]* *[1]Jet Propulsion Laboratory, United States, [2]InterAC, France*	**Estimation of Effective Mass and Interface Loads by a Complementary Vibration Test** *R. Arena[1], M. Giuliano[1], N. Girault[1], N. Roy[2]* *[1]Thales Alenia Space, France, [2]Top Modal, France*

Recent Developments in Traceable Thermometry at NPL *J. Pearce[1], G. Sutton[1], R. Simpson[1], G. Machin[1]* *[1]National Physical Laboratory, United Kingdom*	**Off the sSelf AM Cleats: the Solution to Local Thermoelastic Stresses and Optimized Load Distribution** *L. Hernandez[1], M. G. Cosío[1]* *[1]Citd Engineering & Technologies, Spain*	
The Development of a Deployment Tracking System *M. Robroek[1], M. Ellenbroek[1]* *[1]Airbus Defence And Space Netherlands B.V., Netherlands*	**Probabilistic Assessment of Additive Manufacturing Parts in the Presence of Manufacturing Defects** *S. Romano[1], S. Beretta[1], M. Gschweitl[2], J. Gumpinger[3], T. Ghidini[3]* *[1]Politecnico Di Milano, Italy, [2]RUAG Space, Switzerland, [3]ESA-ESTEC, Netherlands*	
Test Baseplate for MeteoSat Third Generation Telescope Optics: Novel and Versatile Design *N. Nava[1], D. López[1], C. Douville De Franssu[2]* *[1]Lidax, Spain, [2]Thales SESO, France*	**Optimal Design of 3D Printed Panel Inserts** *M. Schatz[1], R. Schweikle[1], M. Jentsch[1], W. Konrad[1]* *[1]Airbus Defence And Space GmbH, Germany*	
POSTER SESSION - 1		

EINSTEIN	ERASMUS	ESCAPE
Fatigue	**Additive Manufacturing - Verification**	
Chair: M. Vorel - G. Sinnema	**Chair: D. Carponcin - R. Russel**	
Numerical Analysis of Initial Crack Propagation under Vibration Fatigue *D. Di Maio[1], F. Magi, I. Sever* *[1]University Of Bristol, United Kingdom*	**Establishment of a Verification Methodology for Parts made by Additive Manufacturing** *D. Carponcin[1], G. Aridon[1], G. Milbourn[1], B. Bonvoisin[2], D. Monteiro[2], L. Pambaguian[2], K. Cabannes[3], F. Montredon[3], M. Palm[4], S. Soller[4], B. Dutton[5], J. Dawes[5]* *[1]Airbus, France / UK, [2]ESA-ESTEC, The Netherlands, [3]Thalès Alenia Space, France, [4]Ariane Group, Germany, [5]MTC, UK*	
Practical Considerations on Residual Stresses and Impact on Dimensioning *M. Vorel[1], M. Parmar[1]* *[1]ArianeGroup, Germany*	**Non Conformance on Additive Manufactured Parts – How to Detect and How to React?** *M. Gschweitl[1], M. Ferrari[1]* *[1]Ruag Space, Switzerland*	
Determination of Critical Energy Release Rates for Steel-CFRP Interfaces Considering Residual Thermal Stresses *E. Petersen[1], C. Hühne[1]* *[1]German Aerospace Center (DLR), Germany*	**Nonlinear Numerical Fracture Analysis of 3d Printed Samples** *F. Cecchini[1], M. Rinaldi[1], G. Oronzo[2], F. Lumaca[2], F. Nanni[1]* *[1]University Of Rome Tor Vergata, Italy, [2]Thales Alenia Space Italia, Italy*	

10:00 - 10:30	**A Novel Computational Shock Prediction Approach Using Hybrid Data-Driven Methodology** *A. Derkevorkian[1], A. Kolaini[1], P. Brewick[2], S. Masri[2], J.-S. Pei[3]* *[1]Jet Propulsion Laboratory/ California Institute of Technology, United States, [2]University of Southern Califonia, United States, [3]University of Oklahoma, United States*	
10:30 - 11:00	**BREAK**	
	NEWTON 1	**NEWTON 2**
11:00 - 13:00	**Shocks - 2**	**Vibration Testing and Shaker Control**
	Chair: P. Camarasa - C. Puillet	**Chair: C. Bisagni - G. Piret**
11:00 - 11:30	**Shock Release System Classification** *J. D'amico[1], S. Behar Lafenêtre[1], D. Dilhan[3], E. Raynal[3], R.Ullio[2], S. Kiryenko[4]* *[1]Thales Alenia Space, France, [2]Thales Alenia Space, Italy, [3]Centre National d'Études Spatiales, France, [4]ESA-ESTEC, Netherlands*	**Performance Assessment of 6-DOF Transient Test Experiments on HYDRA** *M. Appolloni[1]* *[1]ESA-ESTEC, Netherlands*
11:30 - 12:00	**Shock Predictions** *N. Coral Gélis[1], S. Orsingher[1], E. Raynal[2], C. Puillet[2]* *[1]Mecano Id, France, [2]CNES, France*	**Spacecraft Transient Qualification Testing on HYDRA through the Injection of Six-DoF Base Acceleration Inputs Recorded from Coupled Loads Analysis** *S. Fransen[1], H. Fischer[1], M. Appolloni[1], I. Ngan[1], R. Knockaert[1], G. Laduree[1], R. Bureo Dacal[1]* *[1]ESA-ESTEC, The Netherlands*
12:00 - 12:30	**New Experimental Test to Characterize Direct Bonding Shock Resistance** *M. Voisin[1], A. Maurel-Pantel[1], F. Lebon[1], N. Cocheteau[2], S. Begoc[3]* *[1]LMA, France, [2]Thales SESO, France, [3]CNES, France*	**Multiple-Shaker Control for Single-Axis Environmental Vibration Testing** *G. Kleyman[1], H. Bühmann[2]* *[1]Institute of Vibration and Dynamic Research, Germany, [2]m+p international Mess- und Rechnertechnik GmbH, Germany*
12:30 - 13:00	**Shock Attenuator For Equipment (SAFE)** *P. Lamy[1], T. Demerville[1], Q. Bianco[1], S. Kiryenko[2]* *[1]SMAC, France, [2]ESA-ESTEC, The Netherlands*	**Fast Sine Sweep as an Alternative to Classical Sine Sweep for SC Qualification** *E. Cavro[1], N. Roy, A.Girard, P.-E. Dupuis* *[1]Airbus Defence and Space, France*
13:00 - 14:00	**LUNCH**	

New High Cycle Fatigue Test Facility of Adhesively Bonded Ceramic Electronic Components
L. Ben Fekih[1], O. Verlinden[1], C. De Fruytier[2], G. Kouroussis[1]
[1]University Of Mons, Belgium, [2]Thales Alenia Space, Belgium

Effect of Heat Treatment on the Microstructure and Mechanical Properties of Inconel 718 Alloy Produced by Selective Laser Melting
A. Baca[1], M. Sprengel[2], J. Gumpinger[1], A. Brandao[1], T. Ghidini[1]
[1]European Space Research and Technology Centre (ESA-ESTEC), Netherlands, [2]European Space Research and Technology Centre (ESA-ECSAT), United Kingdom

WORKSHOP
Metrology for the Future of Space Craft Testing
10.00-13.00

BREAK

EINSTEIN	ERASMUS
High Velocity Impact	**Material Strength Testing**
Chair: C. Hühne - T. Cardone	**Chair: K. Pfaab - N. Stelzer**
Mitigating the Effect of Space Small Debris on COPV in Space with Fiber Sensors and Self-Repairing Materials *E. Haddad[1], Y. Zhao[2], C. Mert[2], M. Basti[2], K. Tagziria[1], E. Wallach[1], M. Mena[1], A. Saffarpour[1], C. Semprimoschnig[3], U. Lafont[3], I. McKenzie[3]* *[1]MPB Communications Inc., Canada, [2]INRS-EMT, Canada, [3]ESA-ESTEC, The Netherlands*	**Mechanical Testing and Analysis of Hybrid Bonded Joints and Load Introduction Elements** *P. Richert[1], J. Zimmermann[1], T. A. Schervan[1], K.-U. Schröder[1]* *[1]Institute of Structual Mechanics and Lightweight Design, Germany*
Numerical Simulation of Composite Deployable Boom Response Subjected to Hypervelocity Impact (HVI) *E. Giannaros[1], A. Kotzakolios[1], G. Sotiriadis[1], S. Tsantzalis[1], V. Kostopoulos[1], G. Campoli[2]* *[1]University of Patras, Greece, [2]ESA-ESTEC, The Netherlands*	**Verification of Failure Criteria for CFRP Composites under Cryogenic Thermo-Mechanical Loading** *J. Hohe[1], S. Fliegener[1], K.-P. Weiß[2], S. Appel[3]* *[1]Fraunhofer IWM, Germany, [2]Karlsruhe Institute of Technology KIT, Germany, [3]ESA-ESTEC, The Netherlands*
Analytical Prediction of High-Velocity Impact Resistance of Plane and Curved Thin Woven Fabric Composite Targets *M. Pasquali[1], P. Gaudenzi[1]* *[1]Università Di Roma La Sapienza, Italy*	**Innovative Setup for Cryogenic Mechanical Testing of High Strength Metallic Alloys** *M. Tufano[1], C. Zauner[1], A. Morasch[1]* *[1]KRP Mechatec GmbH, Germany*
Influence of Space Environment on Performance and Robustness of thin shell CFRP-Booms *M. Eckhard Zander[1], M. Sinapius[2], C. Hühne[1,2]* *[1]Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) German Aerospace Center, Germany, [2]Technische Universität Braunschweig, Deutschland*	**Aerospace Adhesive Testing for Cryogenic Conditions with Small TAST Specimens** *K. Friedrich Reiling[1], F. Altenwegner[2]* *[1]University Of Applied Sciences Landshut, Germany, [2]SIKA Automotive GmbH, Germany*

LUNCH

	NEWTON 1	NEWTON 2
14:00 - 16:00	**Grid Structures**	**Thermo-Elastic - 1**
	Chair: L. Pavlov - C. Moratto	**Chair: P. Corberand - J. D'amico**
14:00 - 14:30	**Development Logic, Design, Manufacturing and Testing of Pre-Preg Lattice Structures for Satellite Central Cylinder Applications** *L. Pavlov[1], B. Smeets[1], T. Papenhuijzen[1], M. Koot[1], A. Doyle[2], T. Flannagan[2]* *[1]ATG Innovation Ltd., Ireland, [2]ÉireComposites Teo, Ireland*	**Reliability and Accuracy Improvement for Thermo-Elastic Analyses – Process and Tool Applied on the JUICE Mission** *M. Bourdeaud'hui[1], S. Laborde[1], J. Ponsy[1]* *[1]Airbus DS, France*
14:30 - 15:00	**Design and Testing of Additively Manufactured Lattice Structures** *T. Lewis[1], S. Kébreau[1]* *[1]Airbus Defence and Space GmbH, Germany*	**Temperature Mapping for Structural Thermo-Elastic Analyses; Method Benchmarking and Application of the SINAS Method to an Optical Payload** *S. Simonian[1], D. Dykstra[1]* *[1]ATG Europe, The Netherlands*
15:00 - 15:30	**General Overview of Gridded Technology Design for Vega C Interstage 2/3** *A. Zallo[1], M. Cioeta[1], F. de Nicola[2], G. Totaro[2], G. Giusto[2], P. Spena[2], F. Di Caprio[2], S. Mespoulet[3]* *[1]Avio s.p.a, Italy, [2]CIRA, Italy, [3]ESA-ESRIN, Italy*	**Thermal Conductor Generation for Thermal and Thermo-Elastic Analysis Using a Finite Element Model and SINAS** *S. Simonian[1], D. Dykstra[1]* *[1]ATG Europe, The Netherlands*
15:30 - 16:00	**Highly Efficient CFRP Tubular Grid Structures for Satelliets and Payloads: Design and Manufacturing Method** *G.Totaro[1], F. De Nicola[1], G. Giusto[1], P. Spena[1], S. Kiryenko[2]* *[1]Cira - Italian Aerospace Research Center, Italy, [2]ESA-ESTEC, The Netherlands*	**Integration Of Thermo-Elastic Characteristics In Finite Element Method Reduced Models** *M. Trucchi[1], V. Torrelli* *[1]Assystem Technologies, France*
16:00 - 16:30	**BREAK**	
	NEWTON 1	**NEWTON 2**
16:30 - 19:00	**Tanks & COPV's**	**Thermo-Elastic - 2 - Testing**
	Chair: G. Sinnema - M. Voral	**Chair: P.E. Dupuis - G. Casarosa**
16:30 - 17:00	**Mechanical Properties and Microstructure of Next Generation Spacecraft Propellant Tanks Produced via Friction Stir Welding of Ti-6Al-4V** *M. Meisnar[1], A. Norman[2], K. Nor[3], S. Dodds[3], R. Freeman[3], R. Bellarosa[4], T. Ghidini[2]* *[1]ESA-ECSAT, United Kingdom, [2]European Space Agency, The Netherlands, [3]TWI, United Kingdom, [4]Airbus, United Kingdom*	**Highly Accurate Thermo-Elastic Distortion Measurement Technique for Antenna Reflectors** *P.-E. Dupuis[1], J.-C. Csont[1], N. Chauvet[1], B. Palacin[2]* *[1]Airbus Defence & Space, France, [2]CNES, France*

EINSTEIN	ERASMUS	ESCAPE
Fibre Optics - 1	**Ceramics**	
Chair: J. Madrigal - I. McKenzie	**Chair: S. Behar-Lafenêtre - M. Such Taboada**	
State-Of-The-Art of Research on Distributed Optical Fibre Sensors *L. Thévenaz[1], Z. Yang[1]* *[1]Ecole Polytechnique Fédérale de Lausanne, Switzerland*	**Ceramic Structures Sizing and Verification Method Improvements - Investigation of Size Effects in Silicon Carbide** *D. Denaux[1], D. Logut[1], M. Such-Taboada[2]* *[1]Airbus, France, [2]ESA-ESTEC, The Netherlands*	
Fibre Optic Sensors for Spacecraft Structure In-flight Monitoring *S. Abad[1], J. Ortiz Martín[2], F. S. Pinto[1], F M. Araújo[1]* *[1]HBM FiberSensing, Portugal, [2]Airbus DS, Spain*	**Derivation of Three-Parameter Weibull Distributions for Sizing and Verification of Ceramic Materials** *U. Barozzi[1], S. Lucarelli[1], M. Jentsch[1], J. Steiner[1], D. Denaux[2], M. Such Taboada[3]* *[1]Airbus Defence and Space, Germany, [2]Airbus Defence and Space, France, [3]ESA-ESTEC, The Netherlands*	
Structural Health and Usage Monitoring with Fiber Optic Sensors of Unmanned Aircrafts *M. Frovel[1], A. Fernandez[2], J. M. Pintado[1], M. A. de la Torre[1], Dr. Felix Terroba[1], R. Lopez[1]* *[1]Inta, Spain, [2]ETSIAE, Spain*	**Tailoring Ceramic Matrix Composites by Multiscale Simulation for Light Weight and Highly Stiff Space Structures** *J. Schmidt[1], G. Seifert[1]* *[1]Fraunhofer ISC, Bayreuth, Germany*	
Monitoring the Propulsion System of PROBA-2 with Optical Fiber Sensors during 8 Years *E. Haddad[1], M. Mena[1], R. V. Kruzelecky[1], K. Tagziria[1], E. Wallach[1], F. Ricci[2], I. McKenzie[3], N. Karafolas[3], F. Hannoteau[4]* *[1]MPB Communications Inc., Canada, [2]Xiphos Systems Corp, Canada, [3]*Optoelectronics Section, European Space Agency, The Netherlands, 4 European Space Agency, Belgium	**Development of Strong Resistance Brazing Joints for Silicon Nitride Ceramic Parts for Space Applications** *L. Cornillon[1], P. Grasset[1], C. Devilliers[1], S. Behar-Lafenêtre[1], N. Louh[1], A.-C. Bravo[2], T. Campanella[2], F. Gant[3]* *[1]Thales Alenia Space, France, [2]PMB, France, [3]CNES, France*	
BREAK		
EINSTEIN	**ERASMUS**	**ESCAPE**
Fibre Optics - 2	**Composites**	
Chair: L. Thévenaz - N. Karafolas	**Chair: M. Flanagan - U. Lafont**	
A Review of the State-Of-The-Art on the Capabilities of FBG Technologies for Space Sensing Applications *J. M. Alvarez De Con[1]* *[1]Smart Fibres Limited, United Kingdom*	**Demonstration of Thermoplastic Compposites for Space Applications** *F. Preller[1], C. Tschepe[1], A. Doyle[2], M. Ward[2], B. Weafer[2], A. Comer[3], R. O'Higgins[3], R. Schlitt[4], S. Appel[5]* *[1]INVENT GmbH, Germany, [2]ÉireComposites Teo., Ireland, [3]University of Limerick, Ireland, [4]Engineering Services, Germany, [5]ESA-ESTEC, The Netherlands*	

17:00 - 17:30	**A Comprehensive Tool to Simulate Composite Lay-Ups in Pressure Vessels** *L. Bizet[1], K. Mathis[1], P. Saffré[2], D. Halm[3], M. Gueguen[3], P. Francescato[2] [1]CNES, France, [2]Symme, France, [3]Institut P', France*	**Nanometer-order Displacement Measurement Using Built-in Interferometric Sensor for Dimensional Stability of Telescope Structure** *K. Kitamoto[1], T. Kamiya[1], T. Mizutani[1], S. Yasuda[1], R. Shimizu[1] [1]Japan Aerospace Exploration Agency, Japan*
17:30 - 18:00	**A Smearing Technique for the 3D Solid Modeling of Composite Pressure Vessels** *H. Katajisto[1], A. Ahvenainen[2], P. Willems[3] [1]Altair Engineering Finland, Finland, [2]Aalto University, Finland, [3]Optimum CPV, Belgium*	**Novel Technique for Thermal Deformation Test Utilizing Periodic Heating** *T. Miyazaki[1], K. Ishimura[2], Y. Satou[2], T. Miyashita[1] [1]Department of Modern Mechanical Engineering / Waseda University, Japan, [2]Institute of Space and Astronautical Science / Japan Aerospace Exploration Agency, Japan*
18:00 - 18:30	**Composite Overwrapped Pressure Vessel (COPV) Life Test** *R. Russell[1], D. Dawicke[2], J. Hochhalter[3] [1]NASA Kennedy Space Center, United States, [2]Analytical Services and Materials, Inc., United States, [3]NASA Langley Research Center, United States*	
18:30 - 19:00		
19:00 - 22:00	**CONFERENCE DINNER ESTEC RESTAURANT**	

Photonic Integrated Optical Combs for Structural Health Monitoring in Space *S. O Duill[1], F. Smyth[1], D. Gutierrez[1], J. Braddell[1]* *[1]Pilot Photonics, Ireland*	**New High Performance Thermoplastic Composite with Added Functionalities for 3D Printed Structure for Space Application** *M. Rinaldi[1,2], L. Pigliaru[3], F. Lamastra[1,2], L. Ciccacci[1], T. Ghidini[3], F. Nanni[1,2]* *[1]University Of Rome Tor Vergata, Italy, [2]INSTM, Italy , [3]ESA-ESTEC, The Netherlands*	
Integrated Photonic Devices for Low Footprint Fiber Sensing Space Applications *T. Van Leest[1], R. Evenblij[1], P. Kat[1]* *[1]Technobis, Netherlands*	**Next-Generation Metal Matrix Composites for Space Launch Applications** *L. Rollings[1], S. McDonald[1], M. Roy[2], P. Withers[1]* *[1]School of Materials, University Of Manchester, United Kingdom, [2]School of Mechanical, Aerospace and Civil Engineering, University of Manchester, United Kingdom*	
Fiber Sensing for Space Applications *S. Ibrahim[1], R. McCue[1], J. O'Dowd[1], M. Farnan[1], D. Karabacak[2]* *[1]FAZ Technology Ltd., Ireland, [2]Fugro Technology B.V., The Netherlands*	**Performance Enhancement of CF Composites under Fatigue and Static Loading by the Addition of Thermoplastic PPS Veil Additives** *A. Ramji[1], Y. Xu[1], M. Yasaee[1], P. Irving[1]* *[1]Cranfield University, United Kingdom*	
Regenerated Multicore Fibre Bragg Gratings for Structural Health Monitoring in Harsh Environments *J. Madrigal[1], D. Barrera[1], P. Antonio Calderón[1,2], S. Sales[1,2]* *[1]Photonics Research Labs, ITEAM research institute, Universitat Politècnica de València, Spain, [2]Calculation and Monitored Structures CALSENS SL, Universitat Politècnica de València, Spain*		
CONFERENCE DINNER **ESTEC RESTAURANT**		

Day 4 - Thursday 31 May

	NEWTON 1	NEWTON 2
08:30 - 10:30	**Dynamic Coupling**	**Antennas**
	Chair: P. Palmieri - N. Roy	**Chair: L. Datashvili - G. Rodrigues**
08:30 - 09:00	**Proba-3 Dynamic Coupling** A. Salio[1] [1]Airbus Defence And Space, Spain	**Recent Development at HPS GmbH for K-band and Q/V-band Reflector Antennas** P. Proietti Zolla[1], T. Sinn[1], S. Hofer[1], F. Triberti[1], O. Reichmann[1], L. Tiedemann[1], E. K. Pfeiffer[1], A. Ihle[2], J. Santiago Prowald[2] [1]HPS GmbH, Germany, [2]ESA-ESTEC, The Netherlands
09:00 - 09:30	**ACLAD – A New Philosophy for Launcher Coupled Load Analyses** M. Trucchi[1] [1]Assystem Technologies, France	**Streamlined Reflectors Antennas for Dual Deployments** L. Sanchez Izquierdo[1], O. Castro Matias[1], J. L. Pardo Garcia[1] [1]Airbus, Spain
09:30 - 10:00	**Use of Modal Effective Parameters to Improve Structural Optimisation** X. Vaquer Araujo[1] [1]Airbus Defence And Space GmbH, Germany	**Compact Feed and Subreflector Assembly** J. L. Pardo-garcía[1], S. McLaren[2], B. López-Zamora[1], A. Yarza-Fuentes[1] [1]Airbus, Spain, [2]Airbus, England
10:00 - 10:30	**Norton-Thevenin Receptance Coupling (NTRC) as a Payload Analysis Tool** D. Kaufman[1], S. Gordon, A. Majed [1]NASA, United States, [2]Applied Structural Dynamics, United States	**METOP SG - MWI Reflectors Evolution from MARFEQ-MADRAS Heritage** A. Yarza-fuentes[1], M. Esteban-Castaño[1], P. Cortes-Gonzalez[2], O. Castro-Matias[1], S. Daddio[3] [1]Airbus, Spain, [2]CT Ingenieros, Spain, [3]ESA-ESTEC, The Netherlands
10:30 - 11:00	**BREAK**	

EINSTEIN	ERASMUS	ESCAPE
Thermal	**Composites / Thermoplastics**	
Chair: S. Carli - R. Peyrou-Lauga	**Chair: R. Usinger - M. Hillebrandt**	
Thermal Control of the Metop-SG ICI On Ground Calibration Targets *A. Murk[4], D. Döring[1], D. Winter[1], M. Bergadà[2], B. Gimenez Bravo[2], M. Kotiranta[4], K. Pike[3], R. Wylde[3]* *[1]IABG mbH, Germany, [2]Airbus DS Space Systems España, Spain, [3]Thomas Keating Ltd., United Kingdom, [4]Univeristiy of Bern, Institute of Applied Physics, Switzerland*	**Future of Thermoplastics in Space** *U. Lafont[1], E. Amorim[2], E. Laurent[3], C. Semprimoschnig[1]* *[1]TEC-QEE - ESA-ESTEC, The Netherlands, [2]TEC-MSP - ESA-ESTEC, The Netherlands, [3]CNES, France*	
Evaluation of Heat Transfer at the Interface of Spacecraft Equipment *S. Vandevelde[1], A. Daidié[1], M. Sartor[1]* *[1]Institut Clément Ader, Université de Toulouse, UPS, INSA, ISAE-SUPAERO, MINES-ALBI, CNRS, France*	**Automated Layup of Thermoplastic Composites for Space Applications** *K. Doyle[1,2], J.-B. Deyts[3], M. Blais[3], A. Ayuso[4], P. Lefébure[5], A. Gilliot[6], S. Appel[7], A. Doyle[1]* *[1]EireComposites Teo, Ireland, [2]University of Limerick, Ireland, [3]Ariane Group, France, [4]Airbus DS, Spain, [5]Airbus Group Innovation,France, [6]Suprem SA, Switzerland, [7]ESA-ESTEC, The Netherlands*	
Validation of an Analytical Model Describing the Heat Flux Distribution in Load-Bearing CFRP Single-Lap Joints *M. Lange[1], V. Baturkin[2], C. Hühne[1], O. Mierheim[1]* *[1]DLR, Germany, [2]DLR, Germany*	**Modelling and Experimental Investigation of Induction Welding of Thermoplastic Matrix Composites** *M. Flanagan[1,2], B. Weafer[1], K. Doyle[1,4], A. Doyle[1], T. Flanagan[1], R. Canavan[1], M. Bizeul[1], M. Ward[1], B. A.M[5], Ó Brádaigh C.M[6], J. Goggins[2,7], Harrison N.M[3,8]* *[1]EireComposites, Ireland, [2]Civil Engineering, NUI Galway, Ireland, [3]Mechanical Engineering, NUI Galway, Ireland, [4]University of Limerick, Ireland, [5]Department of Engineering, University of Cambridge, UK, [6]Institute for Materials and Processes, School of Engineering, University of Edinburgh, UK, [7]Centre for Marine and Renewable Energy Ireland (MaREI), Ireland, [8]Advanced Manufacturing Research Centre (I-Form), Ireland*	
Wide Range Thermal Test Facility for JUICE Large Appendages, Design and Results *C. Grodent[1], T. Thibert[1], S. Liebecq[1], B. Marquet[1], C. Lebranchu[2], E. Bongers[3], D. Ifrim[4], C. Stanica[4], I. Popa[4], R. Mihalache[4], D. Mihai[4], A. Schnorhk[5]* *[1]Centre Spatial De Liège, Belgium, [2]ADS, France, [3]ADS, The Netherlands, [4]COMOTI, Romania, [5]ESA-ESTEC, The Netherlands*	**Automated Tape Placement with In-Situ Consolidation of Thermoplastic Composites** *K. Doyle[1,2], J. B. Deyts[3], R. M. O'Higgins[2], A. J. Comer[2], S. Appel[4]* *[1]EireComposites Teo, Ireland, [2]University of Limerick, Ireland, [3]Ariane Group, France, [4]ESA-ESTEC, The Netherlands*	**WORKSHOP** **Thermo-Mechanical Analysis and Verification** **10:00 - 13:00**
BREAK		

	NEWTON 1	NEWTON 2
11:00 - 13:00	**FEM / Damping Modelling**	**Joints & Struts**
	Chair: - B. Fransen - J. Fayos	**Chair: C. Tschepe - T. Rohr**
11:00 - 11:30	**FEM Update for BepiColombo Using Multi-Objective Optimisation and Surrogate Models** *M. Ribera Vicent[1], G. Aglietti[2], M. Remedia[2], A. Aizpuru Hofmann[2], A. Kiley[3]* *[1]Imperial College London, United Kingdom, [2]Surrey Space Centre, University of Surrey, United Kingdom, [3]Airbus Defence and Space, United Kingdom*	**Micro-Pins – The Next Step in Composite to Composite and Metal to Composite Joining** *N. Sarantinos[1], V. Kostopoulos[1], G. Di Vita[2], G. Campoli[2], L. Bricout[2]* *[1]AML - Applied Mechanics Laboratory, Greece, [2]ESA-ESTEC, The Netherlands*
11:30 - 12:00	**Damping-Layout Design Approach with Frequency-Content Control** *M. Brumat[1,2], J. Slavic[2], M. Boltezar[2]* *[1]Synopta Gmbh, Switzerland, [2]University of Ljubljana, Slovenia*	**Sentinel-1C&D: Antenna Separation Mechanism for Safe De-Orbiting** *C. Lausch[1], P. Pavia[2], G. Laduree[3], S. Diel[1], M. von Alberti[1], R. Baldassarri[2]* *[1]Airbus Defence & Space GmbH, Germany, [2]Thales Alenia Space, Italy, [3]ESA-ESTEC, The Netherlands*
12:00 - 12:30	**Assessment of Grain Damping Models for Finite Element Analysis of Solid Rocket Motors** *F. Mastroddi[1], C. Riso[1], S. Fransen[2], G. Coppotelli[1], F. Trequattrini[1], A. De Vivo[3]* *[1]Sapienza University Of Rome, Italy, [2]ESA-ESTEC, The Netherlands, [3]AVIO S.p.A., Italy*	**SpaceStrut™, Development of a Full CFRP Strut Solution in the Frame of the Horizon2020 SME Instrument** *F. Ruess[1], B. Braun[1], F. von Dungern[2], C. Tschepe[2], S. Preussler[3]* *[1]Space Structures GmbH, Germany, [2]INVENT GmbH, Germany, [3]Hightex Verstärkungsstrukturen GmbH, Germany*
12:30 - 13:00		**Qualification of a New Strut Joint Using an Inward-Spanning-Screw** *A. Netti[1], R. Styner[1], N. Gradwohl[2], H.-P. Gröbelbauer[2]* *[1]Ruag Space, Switzerland, [2]University of Applied Sciences Northwestern Switzerland, Switzerland*
13:00 - 14:00	**LUNCH**	
	NEWTON 1	**NEWTON 2**
14:00 - 16:00	**Tools for Verification & Analysis**	**Insert Testing**
	Chair: J. Fatemi - D. Jaredson	**Chair: S. Kögl - M. Such Taboada**
14:00 - 14:30	**Time and Cost Reduction for Mechanical Analyses and Tests – Tool for Mechanical Design Validation, Justification, and Testing** *S. L. Sanchez[1], J. Ponsy[1], J.-F. Pinazza[1], G. Zègre[1]* *[1]Airbus, France*	**Fatigue Assessment on GreDom Potted Inserts** *A. Netti[1], S. Kögl[2], H.-P. Gröbelbauer[3]* *[1]Ruag Space, Switzerland, [2]KOEGL Space, Switzerland, [3]University of Applied Sciences Northwestern Switzerland, Switzerland*

EINSTEIN	ERASMUS	ESCAPE
Thermal Testing - 1	**Advanced Materials - 1**	**WORKSHOP Thermo-Mechanical Analysis and Verification 10:00 - 13:00**
Chair: A. Eisenmann - R. Messing	**Chair: A. Baltopoulos - A. Normann**	
The Aeolus Spacecraft TVAC Full Qualification at Centre Spatial de Liège Premises: Description and Challenges. *I. Domken, C. Grodent[1], I. Tychon[1], S. Liebecq[1], V. Samain[1], R. Wimmer[2], M. Davidson[2], J.-C. Barthes[3], O. Lecrenier[3], A. Elfving[4]* *[1]Centre Spatial De Liège, Belgium, [2]Airbus Defence and Space, United Kingdom, [3]Airbus Defence and Space, France, [4]ESA-ESTEC, The Netherlands*	**Development and Design of Multifunctional Composite Structures for Satellite Applications** *S. Perfetto[1], M. Schubert[2], D. Mayer[1], A. Dafnis[2], Heiko Atzrodt[1]* *[1]Fraunhofer Institute for Structural Durability and System Reliability LBF, Germany, [2]Institute of Structural Mechanics and Lightweight Design, Germany*	
Development of a Single Purpose High Temperature Test Setup for the Solar Orbiter Heat Shield *P. Jens Hein[1], D. Lentz[1]* *[1]IABG mbH, Germany*	**Emergence of Airware 2050 for Pressurized and Structural Components of Space Launchers and Crew Vehicles** *M. Niedzinski[1]* *[1]Constellium, United States*	
Thermal Tests of Solar Orbiter FDMs and Antennas Subsystems *B. Provedo[1], C. Borque[1], A. Pereda[1]* *[1]SENER, Spain*	**Novel Space Applications for CNT Composites, an Overview on the Activity NATAP** *L. Tiedemann[1], P. Krzikalla[1], E. K. Pfeiffer[1], C. Pereira[2], M. Martins[3], J. de Wit[4], S. Forero[5], T. Vlček[6], V. Liedtke[7], A. Makaya[8]* *[1]HPS GmbH, Germany, [2]HPS Lda., Portugal, [3]INEGI, Portugal, [4]INVENT GmbH, Germany, [5]FutureCarbon GmbH, Germany, [6]TOSEDA s.r.o., Czech Republic, [7]Aerospace & Advanced Composites GmbH, Austria, [8]ESA-ESTEC, The Netherlands*	
A Successful TAS-I Strategy for Satellites Thermal Vacuum Test Management *G. Bitetti[1], P. Miccichè[1], A. Ciriello[1]* *[1]Thales Alenia Space - CCPI-I AIT Center, Italy*	**Manufacture and Test of C/C-SiC Sandwich Structures** *B. Heidenreich[1], N. Bamsey[2], Y. Shi[1], D. Koch[1]* *[1]Deutsches Zentrum für Luft- und Raumfahrt e.V., German Aerospace Center, Institute of Structures and Design, Germany, [2]ESA-ESTEC, Materials Technology Section TEC-MSP, The Netherlands*	
LUNCH		
EINSTEIN	**ERASMUS**	**ESCAPE**
Thermal Vacuum Test Facilities	**Advanced Materials - 2**	
Chair: E. Bonnet - S. Roose	**Chair: C. Edtmaier - C. Semprimoschnig**	
In Situ Measurement of Sun Simulator Mirror Orientations and Validation of the Ray-Tracking Model *S. Sablerolle[1], R. Vink[1], A. Filatov[2], I. Nagorski[2], M. Appolloni[1]* *[1]ESA-ESTEC, The Netherlands, [2]USHIO Europe BV, Netherlands*	**Demonstration Cases of Spacecraft Elements with Nano-Enabled CFRPs** *A. Vavouliotis[1,2], A. Baltopoulos[1,2], V. Kostopoulos[2], L. Pambaguian[3]* *[1]Adamant Composites Ltd, Greece, [2]Applied Mechanics Laboratory, Greece, [3]European Space Research and Technology Centre (ESA-ESTEC), The Netherlands*	

14:30 - 15:00	**LAUMBS: a New Software for Launch Vehicle Design and Verification During Ascent and Payload Injection** *V. Rossi[1], A. Wiegand[1], S. Shäff[1], M. Toso[2]* *[1]Astos Solution, Germany, [2]ESA-ESTEC, The Netherlands*	**Developtment of a Semi-Automatic, Mobile Insert Pull-Test Machine** *J. Ess[1], H. P. Gröbelbauer[2], R. Usinger[3], D. Nägeli[3]* *[1]Infors AG, Switzerland, [2]University of Applied Sciences Northwestern Switzerland, Switzerland, [3]RUAG Space, Switzerland*
15:00 - 15:30	**Determination of Critical Mechanical Load Cases: A Nonlinear Programming Approach** *K. Bodjona[1], S. Wong[1]* *[1]Airbus Defence And Space Netherlands, The Netherlands*	**Industrialisation of the APM Technology: OneWeb but not Only** *A. Di Carlo[1], A. Isele[1], Mr Dominik Naegeli[1]* *[1]Ruag Space, Switzerland*
15:30 - 16:00	**SpaceBolt™: Fastener Verification Solution for the Space Industry** *N. Asmolovskiy[1], F. Ruess[1], B. Braun[1], G. Campoli[2], M. Such Taboada[2]* *[1]Space Structures GmbH, Germany, [2]ESA-ESTEC, The Netherlands*	**Accelerated Fatigue Testing of Potted Inserts** *S. Kögl[1], H.-P. Gröbelbauer[2], N. Gradwohl[2], R. Usinger[3], Dominik Nägeli[3]* *[1]KOEGL Space, Switzerland, [2]University of Applied Sciences Northwestern Switzerland, Switzerland, [3]RUAG Space, Switzerland*
16:00 - 16:30	**BREAK**	
	NEWTON 1	**NEWTON 2**
16:30 - 18:30	**Load Derivation**	**Special Analyses**
	Chair: W. Konrad - B. Tang	**Chair: P. Nali - M. Toso**
16:30 - 17:00	**Prediction of the Mechanical Environments of the Load Critical Elements of the ATHENA Spacecraft** *S. Fransen[1], C. Sanchez Herrera Cabanas[1], M. Ayre[1], I. Ferreira[1], M. Bavdaz[1], E. Wille[1], A. Stefanescu[1]* *[1]ESA-ESTEC, The Netherlands*	**Towards Real-Time Highly Flexible Multibody System Simulations** *W. Long, P. Tiso* *[1]ETH Zürich, Switzerland*
17:00 - 17:30	**Local Refinement of Classical FEM Solutions Using Elements with Node-Dependent Kinematics** *E. Carrera[1], M. Petrolo[1], A. Pagani[1], E. Zappino[1], A. G. Fiordilino[1], M. H. Nagaraj[1], I. Kaleel[1]* *[1]Politecnico Di Torino, Italy*	**Assessment of a Multi-Payload Insertion Problem by Means of MultiBody Dynamics** *M. Toso[1], J. Demming[2], V. Rossi[3]* *[1]ESA-ESTEC (ATG), The Netherlands, [2]ESA-ESTEC, The Netherlands, [3]ASTOS Solution, Germany*

Measurement and Simulation of Collimation Angle Phenomenon in LSS Sun Simulator *A. Filatov[1], S. Sablerolle[2], R. Vink[2], I. Nagorski[1], M. Appolloni[2], A. Cozzani[2]* *[1]Ushio Europe BV, The Netherlands, [2]ESA-ESTEC, The Netherlands*	**Design & Development of the ExoMars Rover Bioseals** *P. Alvarez Fernandez, J. Jordan, D. Christou*	
VTC1.5 Upgrade – Improvement of Spatial and Temproal Stability of High Flux Sun Simulator *A. Filatov[1], M. Appolloni[2], I. Nagorski[1], S. Sablerolle[2], R. Vink[2]* *[1]Ushio Europe BV, The Netherlands, [2]ESA-ESTEC, The Netherlands*	**Evaluation of Lighter and More Efficient Radiation Protection Materials** *L. Tiedemann[1], P. Krzikalla[1], M. Leininger[2], M. Steffens[3], A. Tighe[4]* *[1]HPS GmbH, Germany, [2]OHB System AG, Germany, [3]Fraunhofer INT, Germany, [4]ESA-ESTEC, The Netherlands*	
Modification of a High Temperature Industrial Furnace for Integration to a Space Simulation Test Facility *D. Lentz[1], P. Jens Hein[1]* *[1]IABG mbH, Germany*	**Friction Stir Welding of Fibre Reinforced Titanium Composites for Aerospace Structures** *N. Iqbal[1], C. Blacker[2], J. Martin[1], K. Beamish[3], A. Makaya[4]* *[1]Twi Ltd, United Kingdom, [2]TISICS Ltd, United Kingdom, [4]ESA-ESTEC, The Netherlands*	
BREAK		
EINSTEIN	**ERASMUS**	**ESCAPE**
Thermal Protection Systems & Parachute Testing	**Joining Technology**	
Chair: H. Ritter - L. Ferracina	**Chair: L. Cornillon - S. Das**	
ExoMars 2020 Mission Pilot Parachutes Dynamic Extraction Test: Overview on Test Development and Implementation *A. Balossino1, L. Marconi1, F. Miglioretti1, V. Tamborra2* *1Arescosmo SpA, Italy, 2Arescosmo SpA, Italy*	**ArianeGroup R&T Activity on Composite Joining Technology** *M. Leroy[1]* *[1]ArianeGroup, France*	
Mathematical Model of a Pneumatic Mortar for Parachute Deployment *A. Balossino[1], L. Marconi[1], F. Miglioretti[1], V. Tamborra[2]* *[1]Arescosmo SpA, Italy, [2]Arescosmo SpA, Italy*	**Glass to Metal Contact Optimization in an Optical Space Instrument Assembly** *C. Flores Diaz[1], J. García Martínez[2], J. .Miguel Encinas Plaza[1], J. Cabrero Gómez[2], M. Colombo Bueno[1], D. Escribano Lahera[1], P. Gallego Sempere[1], Mª del Rosatio Canchal Moreno[1], M. Fernández Rodríguez[1]* *[1]Instituto Nacional de Técnica Aeroespacial (INTA), Spain, [2]ISDEFE, Spain*	

17:30 - 18:00	**Consistent Dimensioning Interface Loads – An Alternative and Less Conservative Approach to Define Loads for Sub-Components** *R. Meitzner[1], V. Ramanolla[1], H. Kellermeier[1]* *[1]ArianeGroup, Germany*	**The Cossmas Project, a Step Forward Towards the Digital Twin of Composite Launchers Structures** *F. Cugnon[1], L. Ballere[2], C. Martin[2], C. Lequesne[1]* *[1]Samtech S.a., Belgium, [2]Ariane group, France*
18:00 - 18:30	**Diversity of Random Vibration Load Definition from Early Phase to Testing Using the Example of Sentinel-2 S/C** *A. Kommer[1], W. Konrad[1], A. Karl[1]* *[1]Airbus Defence And Space GmbH, Germany*	
18:30 - 20:30	**POSTER SESSION - 2**	

Technology for Super Light-Weight Thermal Protection Systems for Space Applications *M. Parco[1], I. F Fagoaga[1], I. Belan[2], I. Neshpor[2], G. Frolov[2], I. Gusarova[3], A. Potapov[3], I. Derevianko[3], I. Falchenko[4], V. Yatsenko[5], L. Silvestroni[6], M. Kütemeyer[7], T. Reimer[7]* *[1]Tecnalia, Spain, [2]Frantsevich Institute for Problems of Materials Science NAS of Ukraine, Ukraine, [3]Yuzhnoye State Design Office, Ukraine, [4]E.O.Paton Electric Welding Institute, Ukraine, [5]Space Research Institute of NASU-SSAU, Ukraine, [6]ISTEC/ CONSIGLIO NAZIONALE DELLE RICERCHE, Italy, [7]Institute of Structures and Design, DLR, Germany*	**Adhesive Free High Stability Optical Mount for Space Laser Applications: Design Optimization For Different CTE Materials Coupling** *P. Mosciarello[1], E. Di Carmine[1]* *[1]Leonardo, Italy*	
Preliminary Analysis on Carbon-Phenolic Thermal Behavior Subjected to an Impinging Flame *G. Dugast[1], P. Tadini[3], K. Chetehouna[3], N. Gascoin[3], M. Bouchez[2], J.-L. Marceau[2], R. Peiffer[2]* 1MBDA France / Laboratoire PRISME, France, Bourges, France, 3Laboratoire Prisme, INSA CVL, Bourges, France	**Development of Stable Sandwich Material Structures for Space Applications** *L. Cornillon[1], O. Damiano[1], S. Behar-Lafenêtre[1], G. Briche[1], F.-R. Gourillon[1], L. Chichignoud[2], M. Ferraris[3], S. De La Pierre[3], V. Michaud[4], M. Piccand[4], J. Caron[4], S. Peeterbroeck[5]* *[1]Thales Alenia Space, France, [2]NTPT, Switzerland, [3]Politecnico di Torino, Italy, [4]EPFL, Switzerland, [5]Materianova, Belgium*	
POSTER SESSION - 2		

Day 5 - Friday 1 June

	NEWTON 1	NEWTON 2
08:30 - 10:30	**Non-Linear Behavior - 1**	**Buckling - 1**
	Chair: M. Jacquesson - M. Ellenbroek	**Chair: J. Wijker - E. Jansen**
08:30 - 09:00	**Observation of Nonlinear Structural Responses in Vibration Testing** *A. R. Kolaini*	**Buckling Test of Composite Cylindrical Shells with Oval Imperfection Under Axial Compression** *A. Takano[1]* *[1]Kanagawa University, Japan*
09:00 - 09:30	**Sentinel-1C&D: Antenna Separation Mechanism Non-Linear Dynamic Behaviour** *G. Laduree[1], D. Bibby[1], M. Hofmann[1], M. v. Alberti[2], C. Lausch[2], S. Diel[2], R. Baldassarri[3]* *[1]ESA-ESTEC, The Netherlands, [2]Airbus DS GmbH, Germany, [3]Thales Alenia Space, Italy*	**Experimental Investigation of Axially Compressed CFRP Thin-Walled Truncated Cones and Cylinders with Cutouts** *R. Khakimova[1], R. Degenhardt[2], D. Wilckens[2]* *[1]Invent Gmbh, Germany, [2]DLR, Germany*
09:30 - 10:00	**Testing and Model Updating of Nonlinear Aerospace Structures** *T. Dossogne[1], J.-P. Noël[1,2], T. Detroux[1,2], G. Kerschen[1,2]* *[1]University of Liège, Belgium, [2]NOLISYS sprl, Belgium*	**Preliminary Study of the Local Buckling Behaviour of DLR's CFRP Booms Induced by the Stowing Process** *S. Meyer[1], M. Hillebrandt[1], C. Hühne[1]* *[1]DLR (German Aerospace Center), Germany*
10:00 - 10:30	**Nonlinearities Detection and Identification: An Experimental and Practical Implementation** *M. Hofmann[1], G. Ladurée[1], R. Knockaert[1]* *[1]ESA-ESTEC, The Netherlands*	**Buckling of Thin Cylindrical Shell Submitted to Local or Harmonic Mechanical Loads** *T. Benoît[2], M. Jacquesson[2], A. Limam[2], H.V. Tran[1]* *[1]UDL, Université de Lyon, France, [2]CNES, France*
10:30 - 11:00	**BREAK**	
	NEWTON 1	**NEWTON 2**
11:00 -13:30	**Non linear behaviour - 2**	**Verification approaches**
	Chair: A. Kolaini - G. Laduree	**Chair: I. Ngan - C. Puillet**
11:00 - 11:30	**Simulation of Non-Linear Damping Devices for Payload Comfort** *J. Marchesini[1], L. Dastugue[1], M. Lequoy[1], R. Helfrich[2]* *[1]Intes France, France, [2]INTES GmbH, Germany*	**Approach to Optimizing Environmental Test Condition Based on Modelling of Test Level and Loss Cost** *S. Shimazaki[1], D. Takahashi[1], Q. Shi[1]* *[1]Japan Aerospace Exploration Agency (JAXA), Japan*

EINSTEIN	ERASMUS	ESCAPE
Vibration Test Simulation & Modelling	**Flexures**	
Chair: G. Aglietti - M. Appolloni	**Chair: G. Rodrigues - M. Richter**	
Virtual Shaker Testing: Actual Achievements in TAS and Future Prospects *P. Nali[1], V. Di Pietro[1], P. Ladisa[1], G. Bitetti[1], F. Lumaca[1], A. Bettacchioli[2]* *[1]Thales Alenia Space, Italy, [2]Thales Alenia Space, France*	**Optimization of Composite Tube Flexures** *M. Santer[1]* *[1]Imperial College London, United Kingdom*	
Post-Test Correlation Activity and 6-DOF Transient Test Validation by Means of Virtual Testing Approaches *M. Remedia[1], G. Aglietti[1], M. Appolloni[2], A. Cozzani[2], A. Kiley[3]* *[1]University Of Surrey, United Kingdom, [2]ESA-ESTEC, The Netherlands, [3]Airbus Defence & Space, United Kingdom*	**Reduction of Moments Induced on the Coiling Hub of a Boom Deployment Mechanism** *M. Richter[1], M. Hillebrandt[1], C. Huehne[1]* *[1]German Aerospace Centre (DLR e.V.), Germany*	
Integrated Solution for Virtual Testing *F. D'ambrosio[1], A. Carrella[2], S. Hoffait[3], G. Patanchon[4]* *[1]Siemens PLM, Belgium, [2]Siemens PLM, Belgium, [3]V²i, Belgium, [4]Ariane Group, France*	**Experimental Verification of Novel Analytical Wrinkling Control Mechanism of Planar Membrane Reflector for Space Application** *S. Kumar[1], S. H. Upadhyay[1]* *[1]Indian Institute of Technology Roorkee, India, [2]Indian Institute of Technology Roorkee, India*	
Experimental Data Driven Approach for Numerical Spacecraft Vibration Test Prediction *S. Waimer[1], B. Peeters[1], M. Wagner[2], P. Guillaume[3]* *[1]Siemens Industry Software NV, Belgium, [2]ESA-ESTEC, The Netherlands, [3]Vrije Universiteit Brussel, Belgium*	**Dynamics Analysis for Spacecraft with a Tendon-Driven Continuum Manipulator** *H. Yao[1], Z. Hu[1], G. Wang[2], M. Si[1], Y. Zhang[1], G. Zheng[1]* *[1]Tsinghua University, China, [2]Beijing Institute of Spacecraft System Engineering, China*	
BREAK		
EINSTEIN	**ERASMUS**	**ESCAPE**
Buckling - 2		
Chair: P. Mourey - U. Block		
Numerical Assessment of Existing Vibration Correlation Techniques *F. Franzoni[1], M. Arbelo[2], R. Degenhardt[1,3]* *[1]DLR, Institute of Composite Structures and Adaptive Systems, Germany, [2]ITA, Aeronautics Institute of Technology, Brazil, [3]PFH, Private University of Applied Sciences Göttingen, Germany*		

11:30 - 12:00	**Identification and Simulation of Non-Linear Vibration Test** *A. Bettacchioli[1]* *[1]Thales Alenia Space, France*	**Influence of Materials and Processes on Mechanical and Design Margins of Telecom Satellite by Use of Stochastic Method and Software** *G. Pommatau[1], S. Das[2], J. D'add[1], J. Dudon[1], J. Buffe[1]* *[1]Thales Alenia Space, France,* *[2]ESA-ESTEC, The Netherlands*
12:00 - 12:30		
12:30 - 13:30	**CLOSING SESSION**	
13:30 - 14:30	**LUNCH**	
14:30 - 15:30	**TOURS** - Materials Lab - Testing	

Mechanical Response of Variable and Constant Stiffness Cylindrical Shells of Launcher Structures *E. Labans[1], C. Bisagni[1]* *[1]Delft University of Technology, The Netherlands*		
Effect of Foam Thermal Insulation Layer on the Buckling of Thin-Walled Cylinders Under Axial Compression, Bending or Shear Load: Space Launchers Application *M. Jacquesson[2], A. Limam[1], F. Lorioux[3], F. Marteau[2], H. Viet Tran[1]* *[1]University of Lyon, France, [2]CNES, France, [3]Airbus, France*		
LUNCH		
TOURS - Materials Lab - Testing		

Poster presentations

P1 Angular Vibration Test System and Its Application in Precise Pointing Mechanism Anti Base Disturbance Test
L. Tan[1], G. Wang[1], J. Luo[1], Q. Meng[1]
[1]Beijing Institute of Space System Engneering, China

P2 Sensors Digital Identification and Configuration Management
F. Canourgues[2], P. Dupuis[1], F. Haddad[1], L. Perrin[2]
[1]INTESPACE, France, [2]CNES, France

P3 Thermal Deformation Testing of Ultra-Stable Structures Down to Cryogenic Temperatures
C. Zauner[1], H. Langer[1]
[1]KRP Mechatec Gmbh, Germany

P4 STM Development of Gregorian Type Top Floor Antenna Structure
C. Turgut[1], M. Atasoy[1]
[1]Aselsan Inc, Turkey

P5 HUB Dispenser: Small-Sat Affordable Access to Space
A. Morales Prieto[1], M. Martín Zurdo[1]
[1]Airbus Defence & Space, Spain

P6 Influece of Materials and Processes on Mechanical and Design Margins of Telecom Satellite by Use of Stochastic Method and Software
G. Pommatau[1], S. Das[2], J. D'add[1], J. Dudon[1], J. Buffe[1]
[1]Thales Alenia Space, France, [2]ESTEC, The Netherlands

P7 Study on Influence of Space Invironment on Optical Solar Reflectors
J. Wang[1]
[1]Lanzhou Institute Of Physics, China

P8 Environmental Test facilities of the DLR Institute of Space Systems
T. Sproewitz[1], N. Melnik[1], E. Mikulz[1], T. Renger[1], P. Seefeldt[1], A. Witzke[1]
[1]German Aerospace Center, Germany

P9 Static and Dynamic Properties Research of a Deployable Space Mast for Membrane Solar Array
S. Wang[1], H. Shangh[2], R. Liu[1], H. Guo[1], Z. Deng[1]
[1]Harbin Institute of Technology, China, [2]China Academy of Space Technologly, China

P10 Irradiation Facilities at DLR-Bremen
M. Sznajder[1,2], T. Renger[1], E. Mikulz[1]
[1]German Aerospace Center, Germany, [2]Institute of Physics, University of Zielona Góra, Poland

P11 Comparison Study of Different Methods of Accelerometer Calibration
E. Bernar[1], C. Merkouris[1], J. Noppen[1], J. Crespo González Calero[1]
[1]ETS BV, Netherlands

P12 Flattening Process Simulation and Parameter Study of Triangular Rollable and Collapsible (TRAC) Booms
Y. Wang[1], H. Yang[2], L. Liu[2], F. Lu[2]
[1]China Electronics Technology Group No.[3]8, China, [2]Anhui University, China

P13 New Large Slip Table and QUAD Expander
R. Vincent[1], I. Jong-Min[2]
[1]Sereme, France, [2]KARI, Republic Of Korea

P14 Accelerating the Industrialization of Additive Manufacturing through Process Simulation an Integrated End-to-End Process
O. Fergani

P15 Static and Dynamic Characterictics Of Spaceraft With Central Cylinders
M. Sahin[1]
[1]TAI Space Systems, Turkey

P16 Pyroshock Tests of Payload Repeater Equipment
A. Kurt[1], C. Yumus[1]
[1]Aselsan INC., Turkey

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