

9th IAASS Conference

International Association for the Advancement of Space Safety

KNOW SAFETY, NO PAIN

TOULOUSE (FRANCE) - 18-20 OCTOBER 2017



BENNU'S JOURNEY - Europa - Credit: NASA Goddard Space Flight Center

PROGRAM

9th IAASS Conference

International Association for the Advancement of Space Safety



Keynote Speakers



Johann-Dietrich Wörner
European Space Agency (ESA)
Director General



Jean-Yves Le Gall
French Space Agency (CNES)
President



Roberto Battiston
Italian Space Agency (ASI)
President



Robert (Bob) Cabana
NASA Kennedy Space Center
Director



George C. Nield
Federal Aviation Administration
Associate Administrator for Commercial
Space Transportation



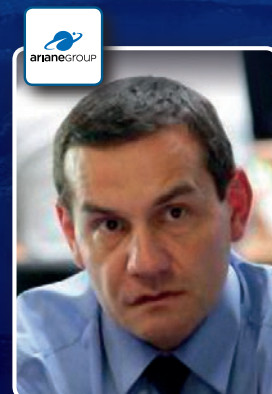
Nobuo Takeuchi
HIREC
High-Reliability Engineering & Components Corporation
President & CEO



Maj. Gen. Andrew M. Mueller
U.S. Air Force
Chief of Safety Commander



W. Michael Hawes
Lockheed Martin Space Systems Company
Vice President
& Orion Program Manager



Herve Gilibert
ArianeGroup
Chief Technical Officer



Wednesday, 18 October 2017

08:30am - 10:30am

P1: Plenary Session

Welcome Message:

Genevieve Campan
CNES Toulouse Center Director

Conference Introduction:

Isabelle Rongier
IAASS President

Keynote Speakers:

Robert (Bob) Cabana
NASA Director Kennedy Space Center

Nobuo Takeuchi
HIREC President & CEO

Andrew M. Mueller
USAF Chief of Safety

Herve Gilibert
ArianeGroup Chief Technical Officer

10:30am - 11:00am

Coffee Break

11:00am - 12:30pm

S-01: Re-entry Safety Risk

Oblate-Earth Effects on the Calculation of Ec During Spacecraft Reentry

John B. Bacon, Mark Matney
NASA, United States of America

Improving Estimation of Ground Casualty Risk from Reentering Space Objects

Chris Ostrom
HX5, United States of America

The D-SAT Mission: Status and Results of a EOL Disposal through Controlled Re-entry

Matteo Trotti, Alessio Fanfani, Marco Bevilacqua, Stefano Antonetti, Lorenzo Ferrario
D-ORBIT, Italy

Oxidation Laws and Emissivity Data at High Temperature for Implementation in DEBRISK Code

Lucile Barka¹, Marianne Balat-Pichelin¹, Julien Annaloro², Pierre Omaly²
¹PROMES-CNRS laboratory, France; ²CNES, France

11:00am - 12:30pm

S-02: Human Performance for Safety & Organizational Culture– I

Moon-Mars habitability: Safety Requirements and Virtual Reality as a Test System

Irene Lia Schlacht¹, Antonio Del Mastro²
¹Politecnico di Milano; ²Mars Planet, Italy

Globalization of New Space Industry into Developing Countries and its Very Significant Impacts on Safety

Norul Ridzuan Zakaria¹, Nasri Nasrun², Azizee Aziz³, Mohd Jamil Mohd Nor⁴, Ashwar Aziz⁴, Amluddin Yusof⁴
¹SOLVES, Italy; ²Space City, Malaysia; ³Spaceport Malaysia, Malaysia; ⁴Space Ventures, Malaysia

Human Error Assessment and Reduction Technique (HEART) and Human Factors Analysis and Classification System (HFACS)

Tiffany Miller Alexander
NASA, United States of America



Role of Veganism in the Future of the Space Exploration

*Hernán David Mateus Jimenez, Omar Andres Lopez Camargo, Diego Andres Mendoza Mora
Universidad Nacional de Colombia, Colombia*

Safety Management - Accelerating Safety Management System (SMS) Transformation

*Gail M Talbott, James W Rudolph
Humanex, Inc, United States of America*

11:00am - 12:30pm

S-03: Commercial Spaceflight - I

Weighing Risk in Microgravity: Evaluating and communicating acceptable levels of risk to commercial customers

*John Christopher Beauregard
Space Policy Institute, United States of America*

Solar Energy and Electric Propulsion for Better Safety Design and Operation of Near Space and Suborbital Vehicles

Norul Ridzuan Zakaria¹, Muhammad Amin Zakaria², Md Sayuti Ishak³, Anass Hanafi⁴, Ivan Cuzzi⁵, Azahar Mat Hasan⁶

¹SOLVES, Italy; ²Perak State Government, Malaysia; ³University Science Malaysia, Malaysia; ⁴University of Torino, Italy; ⁵Al-Biruni, Italy; ⁶Radio Aero Marine, Malaysia

Arguing the (Safety) Case(s) for Space

*Andy Quinn
Saturn SMS Ltd, United Kingdom*

Application of an Innovative Safety and Reliability Assessment Methodology to a Two-Stage Hypersonic Vehicle

*Roberta Fusaro¹, Nicole Viola¹, Davide Ferretto¹, Dario Comitini¹, Martin Sippel²
¹Politecnico di Torino, Italy; ²DLR - Bremen*

11:00am - 12:30pm

S-04: Panel Session:

On-orbit Large Spacecraft Constellation Collision Risk

Chairs: D. McKnight, F. Alby

12:30pm - 2:00pm

Lunch Break

2:00pm - 3:30pm

S-05: Space Debris - I

Insights Gained From the Massive Collision Monitoring Activity

*Darren Scott McKnight
Integrity Applications, Inc, United States of America*

Further Study of Space Debris Collision Warning Techniques

*Ronglan Wang, Bingshong Zhou
National Space Science Center, Chinese Academy of Sciences, China, People's Republic of*

On the End-of-Life Disposal of Spacecraft and Orbital Stages Operating in Inclined Geosynchronous Orbits

*Carmen Pardini, Luciano Anselmo
Institute of Information Science and Technologies (ISTI) of the National Research Council (CNR) of Italy, Italy*

Mitigation Measures for Orbital Debris: No More Debris from Ariane SYLDA

*Stephane Heinrich¹, Kevin Mathis²
¹ALTRAN, France; ²CNES, France*



Optimization Techniques for Feature Detection of Orbital Debris

Helia Sharif^{1,2}, Christian Pfaab¹, Matthew Hölzel¹

¹DLR Space Systems Institute, Germany; ²Universität Bremen, Germany

2:00pm - 3:30pm

S-06: Regulations & Standards - I

Creation of a Comprehensive “Global Space Risk Scale”

Joseph N. Pelton

International Association for the Advancement of Space Safety (USA Chapter)

Space Governance and Stakeholders Roles

Tommaso Sgobba, Isabelle Rongier

IAASS, The Netherlands

Commonality between Chicago Convention and Outer Space Treaty: Merging Air and Space Management

Sanat Kaul

International Foundation for Aviation, Aerospace and Development (India Chapter), India

Safety regulation for UK Launch

Andrew Philip Kuh, Ian Peter Lindsay

UK Space Agency, United Kingdom

2:00pm - 3:30pm

S-07: Panel Session:

Safety Inter-operability of Moon bases

Chairs: D. Isakeit, G. Gafka

2:00pm - 3:30pm

S-08: Designing Safety - I

Proactive and Innovative Risk and Safety Approaches For Small Entrepreneurial Space Systems

Edward Mango

Weintraus, United States of America

Safety Verification of Solar Array Drive Assembly Strength Design Based on the Mission Profile

ZHU Xinggao, REN Liming, CHEN Fengxi

China Astronautics Standards Institute, China, People's Republic of

Lessons Learned from NASA Space Launch System (SLS) Exploration Mission 1

(EM-1) Payload Safety Review Panel (PSRP) for Secondary Payloads

Takashi Goto¹, Masami Miki¹, Masako Kikuchi¹, Koji Oga¹, Toshinori Ikebaga², Ryu Funase³, Tatsuaki Hashimoto⁴

¹Japan Manned Space Systems Corporation, Japan; ²JAXA, Japan; ³University of Tokyo, Japan;

⁴Institute of Space and Astronautical Science, Japan

Challenges of Determining “Safe Enough” in Human Space Flight

Robert Paul Ocampo, David Klaus

University of Colorado, United States of America

3:30pm - 4:00pm

Coffee Break

4:00pm - 6:00pm

S-09: Probabilistic Risk Assessment

Field Programmable Gate Array Failure Rate Estimation Guidelines for Launch Vehicle Fault Tree Models

Mohammad Izeddin Al Hassan, Paul Britton, Steven Novack, Spence Hatfield

NASA, United States of America



Uncertainty Estimation Cheat Sheet for Probabilistic Risk Assessment

*Paul Thomas Britton, Mohammad Izeddin Al Hassan, Robert Ring
NASA, United States of America*

APQP+ Methodology for RAMS activities in Development and Production

Isabelle Guerinel, ASL, France

Probabilistic Risk Assessment model development & applications to operational decision making in HTV

Hiraku Kudo¹, Toru Yoshihara¹, Tatsuya Shirai¹, Masami Miki², Satomi Takada², Takashi Goto², Koji Oga²

¹JAXA, Japan; ²JAMSS, Japan

A Real-Time Launching Calibration System Hardware Design, and Failure Analysis Approach for the Real-Time Mexican Satellite Space Launch Center Using FTA and MARKOV Chains

*Omar Ariosto Niño Prieto, Francisco Ruiz Ciriaco, Vicente Guevara Ayala, Cuauhtemoc Covarrubias Carranza, Jose Luis Sampayo Garcia
OneSide Tech, Mexico*

Probabilistic Risk Assessment for Space Flight Mission Based on Big data of S-SRMDB

*Wenming Zhou, Fuqiu Li, Xiaopeng Li
China Astronautics Standards Institute, People's Republic of China*

4:00pm - 6:00pm

S-10: Launch Safety - I

New Consensus Standards for Ship and Spacecraft Safety During Launch and Reentry

*Paul David Wilde
Federal Aviation Administration, United States of America*

Hazard Areas by an Explosion of a Liquid Launch Vehicle on the Pad

*Hyungseok Sim, Kyusung Choi, Sangyeon Cho
KARI, Korea, Republic of (South Korea)*

The Adequate Balance between Automation and Human Decision

*Gerald Grucker
CNES, France*

Critical Onboard Software : How to Train the Team

*Olivier Boudillet, Goulwen Mintec
AIRBUS SAFRAN LAUNCHERS, France*

4:00pm - 6:00pm

S-11: Space Traffic Control

Integrating Foresight Activities into Space Situational Awareness Capability Development and Operation: Approaches from High Reliability Organisations

*Regina Peldszus
DLR Space Administration, Germany*

VIRAC Capabilities for Space Traffic Control

*Karina Skirmante¹, Vladislavs Bezrukovs¹, Normunds Jekabsons¹, Marcis Bleiders¹, Maria Nachaeva²
¹Ventspils University College, Latvia; ²Radiophysical Research Institute of Nizhny Novgorod State University, Nizhny Novgorod, Russia*

The Network of Passive Correlation Ranging for Geostationary Satellites.

Felix Bushuev¹, Mykola Kaliuzhnyi¹, Oleksandr Shulga¹, Leonid Shakun², Vladislavs Bezrukovs³, Oleksandr Reznichenko⁴, Sergiy Moskalenko⁵, Yevgen Malynovskyj⁶

¹Research Institute «Mykolaiv Astronomical Observatory»; ²Research Institute «Astronomical Observatory» of the Mechnikov Odesa National University; ³Ventspils University College, Latvia; ⁴Institute of Radio Astronomy, the NAS of Ukraine; ⁵Western Center of Radio Engineering Surveillance; ⁶Rivne Minor Academy of Sciences of School Age Youth



The Impact of Security and Defence Policies on the Establishment of a Space Traffic Management Regime

*Ntorina Antoni, Angeliki Papadimitriou, Christina Giannopapa
European Space Agency, France*

4:00pm - 6:00pm

S-11A Lecture:

SpaceLiner the Future European Sub-Orbital Point-to-Point Transportation System

*Martin Sippel
DLR, Bremen, Germany*

SpaceLiner Passenger Capsule Emergency Separation Issues

Jean-Luc Verant, ONERA, Toulouse, France

Thursday, 19 October 2017

8:30am - 10:00am

S-12: Panel Session:

Role of Standards in Commercial Human Spaceflight Safety Governance

Chairs: P. Wilde, T. Sgobba

8:30am - 10:00am

S-13: Re-entry Safety

Casualty Risk Reduction by Semi-Controlled Re-entry

*Tobias Lips, Patrik Kärräng
HTG GmbH, Germany*

Assisted natural reentry with low thrust propulsion

*Elisabet Cid¹, Claire Fremeaux¹, Kristen Lagadec²
¹CNES, France; ²AIRBUS DEFENCE AND SPACE, France*

JELECTRA: New Features of the CNES Launch and Re-entry Risk Analysis Tool

*Jean François Goester, Aurélie Bellucci
CNES, France*

International Space Station Aerothermal Break-up Analysis using SCARAB

*Patrik Kärräng¹, Bent Fritsche¹, Fabian Zander², Stefan Löhle², Tobias Lips¹, Holger Krag³
¹Hyperschall Technologie Göttingen GmbH; ²Institut für Raumfahrtssysteme - Universität Stuttgart;
³ESA/ESOC*

Reachability Analysis to Design Zero-Wait Entry Guidance

*Alejandro González-Puerta, Erwin Mooij
Delft University of Technology, Netherlands, The*

8:30am - 10:00am

S-14: Space Traffic Control

Towards a European Space Traffic Management System

*Ralph Tüllmann¹, Christian Arbinger¹, Stuart Baskcomb², Jens Berdermann³, Hauke Fiedler⁴, Erich Klock⁵, Thomas Schildknecht⁶
¹DLR GfR, Germany; ²ROSAS, Switzerland; ³DLR IKN, Germany; ⁴DLR RB, Germany; ⁵Austro Control, Austria; ⁶Astronomical Institute, University of Bern, Switzerland*

Evolving Space Situational Awareness

*Ruth Stilwell
Aerospace Policy Solutions, LLC, United States of America*

News from SWIM in Space

*Frank Morlang
DLR German Aerospace Center, Germany*



Recent developments of JASST: a Java Space Surveillance and Tracking software library

Michiel Zittersteijn, Pierre Mercier

Thales Services, France

8:30am - 10:00am

S-14A Lecture:

Evolution of Space Safety Organization at NASA

George Gafka

NASA Johnson Space Center, USA

10:00am - 10:30am

Coffee Break

10:30am - 12:30pm

S-15: Commercial Spaceflight

Development of a Flight Test Program for High Mach Spaceplanes with Daily Operating Capability

Charles J Lauer

Rocketplane Global Inc, United States of America

Autonomous Navigation using Gravity Gradient Measurements

Rachit Bhatia, David Geller

Utah State University, United States of America

Assessment of Commercially-Developed Space Vehicles and Evaluation of the DLR SpaceLiner

R Barry Walden¹, Marcel Lariviere¹, Michael Tevrez Kezirian^{1,2}

¹University of Southern California, United States of America; ²International Space Safety Foundation, United States of America

10:30am - 12:30pm

S-16: Launch Safety

Rafael's Test Range Safety Analysis Tool

Ronen Ingbir

Rafael Advanced Defense Systems LTD., Israel

A Novel Approach for Impact Point Prediction Based on Multiple Model Estimation with Dual Mode Tracking Radar

Haryong Song, Yongtae Choi

Korea Aerospace Research Institute, Korea, Republic of (South Korea)

Design-to-Safety: Analysis of the Explosion and Fragmentation Influence on Inert Debris Impact Footprints and Mitigation Solutions for Innovative Launcher Concepts

Alexandra Martinez Torio

CNES, France

Small Rocket Flight Safety (SS520-4)

Ryoji Kobayashi

JAXA, Japan

10:30am - 12:30pm

S-17: Panel Session:

International Space Traffic Management and Space Governance

Chairs: K.-U. Schrogl, W. Ailor

10:30am - 12:30pm

S-18: Regulations & Standards – II

Space Safety and Global Space Governance

Ram S. Jakhu¹, Joseph N. Pelton²

¹McGill University, Canada; ²IAASS (USA Chapter), USA



A Model for Setting a Regulatory Framework for the Development of Sub-orbital Operations in Italy

Giovanni Di Antonio¹, Marco Sandrucci¹, Francesco Santoro², Alberto Del Bianco², Cristoforo Romanelli², Alessandro Cardi¹

¹ENAC - Italian Civil Aviation Authority; ²ALTEC S.p.A.

Unmanned High Altitude Platforms on the Way up; is there Lessons to be Learned?

Taro-Jesus Jossarian Kuusiholma

UAS Consultancy, Finland

The SpaceLegalTech On-Line Database

Lucien Rapp

Université Toulouse1-Capitole, France - Chaire SIRIUS

12:30pm - 2:00pm	<i>Lunch Break</i>
2:00pm - 3:30pm	P2: Plenary Session
Keynote Speakers:	<p>Roberto Battiston <i>ASI President</i></p> <p>George Nield <i>FAA Associated Administrator</i></p> <p>Johannes-Dietrich Woerner <i>ESA Director General</i></p> <p>Jean-Yves Le Gall <i>CNES President</i></p> <p>Michael Hawes (TBC) <i>Lockheed Martin Space Systems Company Vice President & Orion Program Manager</i></p>
3:30pm - 4:00pm	<i>Coffee Break</i>
4:00pm - 5:30pm	S-19: Space Debris – II
	<p>Effect of Large Constellations on Satellite Lifetime in Orbit <i>William Ailor, Glenn Peterson, James Womack, Megan Youngs</i> <i>The Aerospace Corporation, United States of America</i></p> <p>Economic Fundamentals of Mitigating Orbital Debris <i>Martin K Zhu</i> <i>Federal Aviation Administration (FAA), United States of America</i></p> <p>Upper Stage Passivation as a Means of Preventing Space Debris Appearance <i>Roman Viktorovich Mykhalchyshyn</i> <i>Yuzhnoye State Design Office, Ukraine</i></p> <p>Evaluating MMOD Risk Assessments Using Anomaly Data <i>Michael David Squire</i> <i>NASA, United States of America</i></p> <p>Feasibility study on Dyneema(Registered) based spacecraft impact shielding <i>Bob Verheijen¹, Derek Ian Gransden¹, Ulrich Heisserer², Harm van der Werff²</i> <i>¹Delft University of Technology, The Netherlands; ²DSM Dyneema, The Netherlands</i></p>
4:00pm - 5:30pm	S-20: Panel Session:
	<p>Air -launches and airports/spaceports safety <i>Chairs: T. Pfitzer, A. Quinn</i></p>

4:00pm - 5:30pm

S-21: Designing Safety – II**Mars Space Suit Safety**

Joao Lousada
GMV Insyen, Germany

Radiation Shielding for Long-Term Manned Space Missions

William Jerome Burger
FBK and TIFPA, Italy

Orion: Fly Safely with European Design

Florian Bittner
Airbus DS, Germany

Design For Minimum Risk approach for Ariane 6

Thierry Garnier
Airbus Safran Launchers, France

Risk Management for Dynamic Radioisotope Power Systems

Christopher Matthes, Ph.D., David Woerner
NASA Jet Propulsion Laboratory

4:00pm - 5:30pm

S-22: Panel Session:**Habitability and Human Performance on Mars Missions**

Chairs: T. Beard, G. Boy

Friday, 20 October 2017

8:30am - 10:30am

S-23: Space Traffic Control**Autonomous Feature Detection Technique of Orbital Satellites**

Helia Sharif¹, Borja Martinez Calvo²
¹DLR Space Systems Institute, Germany; ²OHB System AG, Germany

ELROI: A License Plate for Your Satellite

David M. Palmer
Los Alamos National Laboratory, United States of America

Calculating a New Probability Density Function for Collision Probability Between Space Objects

Asiye Türker¹, Prof. Dr. İnan Güler¹, Ümit Cezmi Yılmaz²
¹Gazi University, Turkey; ²TURKSAT A.Ş.

Risk of Collision: Effective Mitigation through Next Generation SDA Operational Services

Mark Dickinson
Space Data Association, United Kingdom

8:30am - 10:30am

S-24: Re-entry Safety – II**A First Step toward Fragmentation Process Assessment of Re-entering Spacecraft: Mechanical Stress Analysis with the Spacecraft Oriented Simulation tool PAMPERO.**

Guillaume Prigent¹, Javier Carro², Baptiste Crusson², Laurent Stainier³, Pierre Omaly¹
¹CNES, France; ²GMV, France; ³Ecole Centrale Nantes - Institut GeM (UMR 6183 CNRS/ECN/UN), France

Uncertainty Quantification with DEBRISK: Morris and ANOVA Methods for Preliminary Analysis

Guillaume Prigent¹, Paul Legoux¹, Stéphane Galera², Julien Annaloro¹, Pierre Omaly¹
¹CNES, France; ²Altran, France



Extrapolation of Population Grids for Risk Analysis

Aurélie Bellucci¹, Nadine Tholey², Mathias Studer², Jean-François Goester¹, Nathalie Fuentes¹

¹CNES, France; ²ICube/SERTIT, Université de Strasbourg, France

Risk Analysis Between Aircrafts and Space Debris During Atmospheric Re-Entry

Aurélie Bellucci¹, Nathalie Fuentes¹, Ana Guerra-Algaba², Morgan Cointe-Fourrier², Jean-François Goester¹

¹CNES, France; ²APSYS, France

Benchmark of JAXA and CNES Re-Entry Safety Analysis Tools for Accurate Heat-Flux Prediction

Keiichiro Fujimoto¹, Yasuhiro Saito¹, Hideyo Negishi¹, Prigent Guillaume², Martin Spel³

¹Japan Aerospace Exploration Agency, Japan; ²Centre national d'études spatiales; ³R. Tech

8:30am - 10:30am

S-25: Designing Safety

The Radiation Safety Issue of the Nuclear Reactor Power System for Manned Martian Bases

Jian Guo, Gu Hu, Xiaobo Sun

China Institute of Atomic Energy, China, People's Republic of

Study of Radiation-Induced Effects on Inert Solid Propellant

Matteo Trotti¹, Alexander Weigand², Daniele Alloni³, Lorenzo Ferrario¹, Peter Jacob²

¹D-ORBIT, Italy; ²Bayern-Chemie GmbH; ³L.E.N.A. Università degli studi di Pavia

CAST Analysis of the International Space Station EVA 23 Suit Water Intrusion Mishap

Akshay Kothakonda

Dhruva Space, India

Manned Mission to Mars: Technological Up Gradation Required and Mission Design

Ankita Vashishtha

Indian Railways, India

Derivation of the French Space Operation Act requirements in the Specifications of the future European Launcher Ariane 6

Nathalie Dias

ArianeGroup, France

10:30am - 11:00am

Coffee Break

11:00am - 12:30pm

S-26: NEO Hazards

Survey of Meteorite Falls: the FRIPON Project

Jeremie Vaubaillon, Francois Colas, Chiara Marmo, Sylvain Bouley, Brigitte Zanda, Mirel Birlan, Pierre Vernazza, Auriane Egal, Jerome Gattacceca, Adrien Malgoyre, Julien Lecubin, Cyrille Blanpain, Stephane Caminade, Jean-Louis Rault

Observatoire de Paris, France

Cosmic Threat from Near-Earth Objects.

Daniel Hestroffer, Josselin Desmars, Siegfried Eggel, William Thuillot, Jérémie Vaubaillon

Paris observatory, PSL research university, CNRS, Sorbonne universités, UPMC univ. Paris06, univ. Lille, France

Simulated Response to Fictitious Asteroid Threat

Nahum Melamed

The Aerospace Corporation, United States of America

Piezoelectric Actuator Controlled Lower Wavefront Sensor to Enhance Stability in Long Duration Exposures for Use in the Direct Imaging of Hazardous Space Objects.

Samuel Mark Harrison

International Space University, Strasbourg France



An Exercise in Planetary Defense

William H Ailor

The Aerospace Corporation, United States of America

11:00am - 12:30pm

S-27: Performance for Safety & Organizational Culture

Recovery of Habitual Gait Speed after 60 Days of Bed Rest in Young Healthy Male Subjects

Marcello Grassi¹, Martin Daumer¹, Jörn Rittweiger², Uwe Mittag², Patrick Lau², Markus Gruber³, Edwin Mulder²

¹SLC The Human Motion Institute, Munich, Germany; ²Institute of Aerospace Medicine, German Aerospace Center (DLR), Cologne, Germany; ³Sport Science Department, Universität Konstanz, Konstanz, Germany

Strategic Employee Development in the Government Sector

Johnny Nguyen, Nathalie Guevara, Rebecca Barnett, Barbara Thorpe

NASA, United States of America

The Impact of a Haemodynamic Push-Pull Effect on Gz Tolerance During Simulated Sub-Orbital Spaceflight

Arjan J.H. Meskers¹, Eric L. Groen¹, Mark M.J. Houben¹, Ries M. Simons¹, Erik Frijters²

¹TNO Technical Sciences, The Netherlands; ²Centre for Man and Aviation, Royal Netherlands Air Force

Consequences of Cardiac Rhythm Disturbances for Commercial Human Spaceflight

Christian Lüthen

Erasmus MC - University Hospital Rotterdam, Netherlands, The Netherlands, The

11:00am - 12:30pm

S-28: Panel Session

Space Safety Institute and Commercial Standards

Chairs: M. Kezirian, I. Rongier

12:30pm - 2:00pm

Lunch Break

2:00pm - 3:00pm

P3: Plenary Closing Session Part I

Astronaut Cognition

Bettina L. Beard

NASA-Ames, USA

3:00pm - 4:00pm

P4: Plenary Closing Session Part II

Human-Centered Design of Upcoming Manned Mars Missions

Prof. Guy A. Boy

Florida Institute of Technology, USA

4:00pm - 4:30pm

Conference Wrap-Up & Announcements

Isabelle Rongier

IAASS President

SPACE SAFETY WEEK

Toulouse - France
16-20 October 2017



IAASS Safety Academy - Professional Training Courses

- # 1 SOFTWARE SYSTEM SAFETY
- # 2 RE-ENTRY SAFETY ANALYSIS
- # 3 SPACE DEBRIS: RISK ANALYSIS & MITIGATION

16-17 October

1st International Workshop on SPACECRAFT ENVIRONMENTAL ANOMALIES

16-17 October

6th International Workshop on LAUNCH & RE-ENTRY SAFETY

16-17 October



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<http://iaassconference2017.space-safety.org/>



BENNU'S JOURNEY - Europa - Credit: NASA Goddard Space Flight Center

<http://iaass.space-safety.org/events>