International Academy of Astronautics

IAA Space Exploration Conference
Planetary Robotic and Human Spaceflight Exploration

January 09, 2014
Washington DC, USA

Preliminary Program

2014 IAA SPACE EXPLORATION CONFERENCE
PRELIMINARY PROGRAM

INTERNATIONAL ACADEMY OF ASTRONAUTICS

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Washington DC, USA, Thursday 9 January 2014

Dear Conference Participant,

I would like to welcome you to the Space Exploration Conference of the International Academy of Astronautics (IAA) held in Washington DC, USA on Thursday 9 January 2014. This event will assemble fresh new ideas and proposals on planetary robotic and human spaceflight exploration in such a manner that it will prepare the Heads of Space Agencies Summit on Space Exploration the next day on 10 January 2014 at the Ronald Reagan Building and International Trade Center.

This conference will have innovative presentations in 6 parallel sessions: 1) human aspects in spaceflight, 2) scientific goals in robotics missions, 3) technical factors: enabling technologies / common requirements, 4) private industry's role in space exploration and exploitation: technical, policy and legal considerations, 5) space exploration: the imperative of global cooperation, 6) space stations utilization for robotics and human spaceflight exploration.

For more than 50 years, the Academy activities have always strengthened the effectiveness and supported global space activities. The intent is to foster closer and broader international cooperation and in order to accomplish this goal, the Academy, following the 2010 Summit Declaration, has engaged for the past two years in Summit follow-on activities. All major space agencies have prepared this event and it should be a restart of international cooperation.

Concrete presentations and visionary proposals will provide additional impulse to the Heads of Space Agencies Summit. This will also contribute to frame the space exploration of the future that should enlarge to more countries emerging or willing to emerge to space. Space is for all and the young generation should recognize in this event a founding step in the space for humanity.

Dr. Jean-Michel Contant
Secretary General

2014 IAA SPACE EXPLORATION CONFERENCE
PRELIMINARY PROGRAM

Thursday 9 January 2014

07:30-08:30 Registration
Amphitheatre Foyer

08:30-09:10
Amphitheatre Plenary Session

09:15-12:15

Polaris Suite A	1-A: Human Aspects in Spaceflight
Oceanic Suite	2-A: Scientific Goals in Robotics Missions
Hemisphere B	3-A: Technical Factors: Enabling Technologies/Common Requirements
Meridian Suite	4-A: Private Industry's Role in Space Exploration and Exploitation: Technical, Policy, and Legal Considerations
Hemisphere A	5-A: Space Exploration: The Imperative of Global Cooperation
Polaris Suite C	6-A: Space Stations Utilization for Robotics and Human Spaceflight Exploration

12:15-13:30
Amphitheater Foyer Networking Lunch

13:00-13:30
Amphitheatre Foyer Poster presentation

13:30-17:00

Polaris Suite A	1-B: Human Aspects in Spaceflight
Oceanic Suite	2-B: Scientific Goals in Robotics Missions
Hemisphere B	3-B: Technical Factors: Enabling Technologies/Common Requirements
Meridian Suite	4-B: Private Industry's Role in Space Exploration and Exploitation: Technical, Policy, and Legal Considerations
Hemisphere A	5-B: Space Exploration: The Imperative of Global Cooperation

18:30-22:30
Reception and Gala Dinner

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Plenary Session

Thursday January 9, 2014
08:30-09:10
Location: Amphitheater

07:30 – 08:30	Registration
08:30 – 08:40	Opening Remarks, *Madhavan Nair, IAA President; Jean Michel Contant, IAA Secretary General*
08:40 – 08:55	IAA Planetary Robotic Exploration Activities Presentation *Marcello Coradini, (ESA/JPL) and Catharine Conley (NASA HQ)*
08:55 – 09:10	IAA Human Spaceflight Activities Presentation *Giuseppe Reibaldi (IAA) and Sundaram Ramakrishnan (ISRO, India)*

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Session 1-A: Human Aspects in Spaceflight

Thursday January 9, 2014 09:15-12:15
Location: Polaris Suite A
Session Chairs: Marlene Y. MacLeish, USA; Joan Vernikos, USA
Rapporteur: Jeffrey Davis, USA

09:15
IAA- WAS0101 An Exploration of the Effectiveness of Artificial Mini-Magnetospheres as Solar Storm Shelters for Long Term
Ruth A. Bamford, Cheryl Collingwood, B. Kellett, W.J. Bradford - RAL Space, U.K; R. Bingham, RAL Space, University of Strathclyde, UK, Scotland; E.P. Alves, L. Silva- Instituto Superior Técnico, Portugal; R.A. Fonseca, Instituto Universitário de Lisboa, Portugal; M. G. Benton, Boeing, USA; T.N. Todd, R. Stafford-Allan - Culham Science Centre, U.K; I.A. Crawford, Birkbeck College, London.

09:30
IAA- WAS0102 Reduced otolith function in 15 cosmonauts after return from ISS
E. Hallgren, K. Buytaert, A. Weerts, F. Wuyts- University of Antwerp AUREA, Belgium; L. Kornilova, I. Naumov, D. Glukhikh - Institute of Biomedical Problems, Russia; H. MacDougall, University of Sydney School of Psychology, Australia; S. Moore, Mount Sinai School of Medicine Human Aerospace Laboratory, USA; P. - F. Migeotte, Q. Delière -Royal Military Academy Viper, Belgium; G. Clément, International Space University, France; A. Diedrich, Vanderbilt University Autonomic Dysfunction Center, USA.

09:45
IAA- WAS0103 A New Spaceflight-Associated Syndrome is Driving Advances in Neurocritical Care on Earth
Dorit Donoviel, Jeffrey P. Sutton -National Space Biomedical Research Institute, USA.

10:00
IAA- WAS0104 Recommendations arising from a feasibility study of (a) Astronaut Standardized Career Dose Limits in LEO and the outlook for BLEO; (b) the Biological Response of Humans to Energetic Particle Radiation under microgravity conditions
Susan M. P. McKenna-Lawlor, Space Technology Ltd., Ireland; Leena Tomi, John H. Chapman Space Centre, Canada; Li Yinghui, Astronaut Research and Training Center, China; Guenther Reitz, Institute of Aerospace Medicine and Radiation Biology, Germany; U. Straube, European Astronaut Centre, Germany; A. Bhardwaj, Vikram Sarabhai Space Centre, India; AK Lal, AK Singhvi - Space Applications centre, India; Aiko Nagamatsu, Japan Aerospace Exploration Agency, Japan; Sheikh Muszaphar Shukor, Universiti Kebangsaan, Malaysia; F. Ferrari, University of Szczecin, Poland; B. Zagreev, Central Research Institute for Machine Building TsNIIMash, Russia; Vladislav Petrov, Russian Academy of Sciences, Russia; Michael Panasyuk, Nikolay Kuznetsov, Rikho Nymmik - Skobeltsyn Institute of Nuclear Physics, Russia; L. Townsend, The University of Tennessee Knoxville, USA; Lawrence Pinsky, University of Houston, USA.

10:15
IAA- WAS0105 Designing Crew Habitats for Long Term Physical and Psychological Health and Radiation Safety
Ayako Ono, Japan Mars Society, Japan; Kent Nebergall, Chicago Society for Space Studies, USA; Irene Lia Schilact, Technische Universitaet Berlin, Germany; Olga Bannova, University of Houston, USA.

10:30
IAA- WAS0106 Study of Possible International Protocol to handle Crisis/Emergency of Astronauts in Low Earth Orbit
S. Ramakrishnan, Unnikrishnan Nair S. - ISRO, India.

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10:45
IAA- WAS0107 Effects of Time in Mission: ISS Astronauts Ratings of Stress
David F. Dinges, Mathias Basner, Christopher W. Jones, Adrian J. Ecker - University of Pennsylvania, USA; Daniel J. Mollicone, Rachel Bartels, Christopher Mott - Pulsar Informatics Inc., USA.

11:00
IAA- WAS0108 The NASA Human Health and Performance Center – a Global Convener of Collaborative Projects to Improve the Public Health
Jeffrey R. Davis, NASA, USA; Elizabeth E. Richard, Wyle, USA.

11:15
IAA- WAS0109 Options for International Cooperation in the area of Space Life Science: previous experience and future
Patrik Sundblad, Aerospace Physiology Centre, Sweden; Jennifer Ngo-Anh, Oliver Angerer, Jason Hatton, Martin Zell - ESA/ESTEC, The Netherlands; Volker Damann, ESA/EAC, Germany.

11:30
IAA- WAS0110 Researcher and test-pilot in space: from the ISS to Exploration
Igor V. Sorokin, Alexander Yu. Kalery - Korolev RSC Energia, Russia.

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Session 1-B: Human Aspects in Spaceflight

Thursday January 9, 2014 13:30-17:00
Location: Polaris Suite A
Session Chairs: Marlene Y. MacLeish, USA; Joan Vernikos, USA
Rapporteur: Jeffrey Davis, USA

13:30
IAA- WAS0111 SPACE: a laboratory for biomedical researches
Chantal Cappelletti, Filippo Graziani - G.A.U.S.S. Srl, Italy.

13:45
IAA- WAS0112 The astronaut's tool box for interplanetary spaceflight
Christopher Ferguson, Boeing Space Exploration, USA.

14:00
IAA- WAS0113 NASA's Approach to Critical Risks for Extended Human Spaceflight
Mark Shelhamer, NASA Johnson Space Center,USA.

14:15
IAA- WAS0114 Teaching Rocket Science Commercially Enabling the Next Generation to "Boldly Go"
Peter A. Swan, International Space Elevator Consortium, USA; Michael L. Delorenzo, Wiley J. Larson, Teaching Science and Technology Inc., USA.

14:30
IAA- WAS0115 Twin Sons: Employing Astro-OmicsTo Study NASA'S Kelly Twins
Graham B. I. Scott, National Space Biomedical Research Institute, USA; John B. Charles, Mark Shelhamer, Craig E. Kundrot - NASA, USA.

14:45
IAA- WAS0116 Public/Private Human Access to Space – Status of the activities and further actions
Simonetta Di Pippo, European Space Policy Observatory, Italian Space Agency, Brussels, Belgium; Ken Davidian, Federal Aviation Administration, USA.

15:00
IAA- WAS0117 Space Medicine and Physiology in the Exploration Era - The Cologne Resolution
Rupert Gerzer, Institute of Aerospace Medicine, DLR, Germany.

15:15
IAA- WAS0118 Results of United Nations/China Workshop on Human Space Technology
Giuseppe Reibaldi, IAA, France; Takao Doi, Vienna International Center, Austria.

15:30
IAA- WAS0119 Global Cooperation for Space Development and Knowledge Transfer in Africa
Marlene M. MacLeish, Morehouse School of Medicine, USA; Joseph O Akinyede, National Space Research and Development Agency, Nigeria; Nandu Goswami, Medical University Graz, Austria; William A. Thomson, Baylor College of Medicine, USA.

15:45
IAA- WAS0120 Space Exploration: The Imperative of Global Cooperation
Efim Malitikov, International Association "Znanie", Russia.

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Session 2-A: Scientific Goals in Robotics Missions

Thursday January 9, 2014 09:15-12:15
Location: Oceanic Suite
Session Chairs: Vincenzo Giorgio, Italy; Michael Elsperman, USA
Rapporteur: Gregg Vane , USA

09:15
IAA- WAS0201 Interplanetary Space Weather: A New Paradigm
Madhulika Guhathakurta, NASA, USA.

09:30
IAA- WAS0202 Innovative Low Cost Planetary Missions
John D Baker, JPL/California Institute of Technology, USA.

09:45
IAA- WAS0203 Phobos Sample Return as a Precursor of the Mars Sample Return
Lev Zelenyi, Alexander Zakharov, Oleg Korablev - Institute for Space Research, Russia; Maxim Martynov, Lavochkin Science and Industry Association, Russia; Alexei Ivanov, George Karabadzak - TSNIIMASH, Russia.

10:00
IAA- WAS0204 Exploring Venus, a Natural Planetary Laboratory with Internationally Coordinated Missions
Sanjay S. Limaye, University of Wisconsin, USA; Ludmilla Zasova, IKI, Russia; Colin F. Wilson, Oxford University, UK; Richard C. Ghail, Imperial College, UK; A.C. Vandaele, BIRA, Belgium; Wojciech. J. Markiewicz, Max Planck Institute for Solar System Research, Germany; Thomas Widemann, Paris Observatory, France; Takeshi Imamura, JAXA, Japan; Franck Montmessin, Emmanuel Marcq - LATMOS, France; James A. Cutts, JPL, USA; James Head, Brown University, USA.

10:15
IAA- WAS0205 Thirty-six years in space and counting: Voyager 1 crossed into the Galaxy
Stamatios M. Krimigis, Johns Hopkins University Applied Physics Laboratory & Academy of Athens, USA,Greece.

10:30
IAA- WAS0206 Titan Beyond Cassini: Scientific Questions for Missions in the 2020s
Conor A. Nixon, NASA Goddard Space Flight Center, USA; Ralph D. Lorenz, Johns Hopkins University Applied Physics Laboratory, USA.

10:45
IAA- WAS0207 Venus' robotic exploration at cloud level: a US-European perspective
T. Widemann, Observatoire de Paris, France; K. Griffin, R. Polidan, D. Sokol, G. Lee - Northrop Grumman Aerospace Systems, USA; A. Määttänen, Université Versailles St Quentin, France; V. Wilquet, IASB-BIRA-BISA, Belgium; K. McGouldrick, University of Colorado Boulder, USA; K.L Jessup, SouthWest Research Institute, USA; C. Wilson, Oxford University, UK; L. Bolisay, N. Barnes - L'Garde Inc, USA; S. Limaye, University of Wisconsin, USA.

11:00
IAA- WAS0208 Expanding Options for Implementing Planetary Protection During Human Space Exploration and Robotic Precursor Missions
Catharine Conley, NASA, USA; Pascale Ehrenfreund, George Washington University, USA; Richard Heidmann, France; Craig E. Kundrot, NASA Johnson, USA; Margaret S. Race, SETI; François Raulin, Université Paris-Est Creteil, France; Yury Razoumny, Cosmoexport Aerospace Research Agency, Russia; Guiseppe Reibaldi, IAA, France; Petra Retburg, DLR, Germany; John D. Rummel, East Carolina University; Somya S. Sarkar, Space Applications Centre, India; James A. Spry, JPL, USA; Feng Tian, Tsinghua University, China; Valery Trushlyakov, Omsk State Technical University, Russia; Tatyana Zenchenko, Space Research Institute, Russia; Gao Zhaohui, Chinese Academy of Launch Vehicle Technology, China.

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11:15
IAA- WAS0209 Preparing for Crew-Control of Surface Robots from Orbit
Maria Bualat, Terrence Fong, Chris Provencher, Ernest Smith - NASA, USA; William Carey, Andre Schiele, Philippe Schoonejans - ESA, ESTEC, the Netherlands; Kim Nergaard, ESA, ESOC, Germany.

11:30
IAA- WAS0210 Accelerating the Pace of Outer Solar System Exploration
Michael Elsperman, Kurt Klaus - Boeing, USA.

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Session 2-B: Scientific Goals in Robotics Missions

Thursday January 9, 2014 13:30-17:00
Location: Oceanic Suite
Session Chairs: Vincenzo Giorgio, Italy; Michael Elsperman, USA
Rapporteur: Gregg Vane, USA

13:30
IAA- WAS0211 Exploring the Solar System with a Combination of Large and Small Robotic Missions as a Model for International Collaboration
Gregg Vane, California Institute of Technology, USA.

13:45
IAA- WAS0212 Studies of Lunar South Pole by Russian Landing Missions “Luna-Glob”, “Luna-Resurs” and “Luna-Grunt”
Igor Mitrofanov, Lev Zelenyi - Russian Academy of Science, Russia; Vladimir Dolgopolov, Viktor Khartov, Alexandr Lukjanchikov - Lavochkin Science and Industry Association, Russia.

14:00
IAA- WAS0213 FOCAL: a Robotic Space Mission to 550 AU to Exploit the Sun Gravitational Lens
Claudio Maccone, IAA, Italy; Amalia Ercoli Finzi, Michele Lavagna, Nicolo Cattaneo, Michele Fani, Lorenzo Ferrario, Andrea Galbiati, Samuele Salvi - Politecnico di Milano, Italy.

14:15
IAA- WAS0214 The Europa Clipper Mission Concept: Exploring Europa to Investigate Its Habitability
Robert Pappalardo,Barry Goldstein, David Senske, Brian Paczkowski,Steve Vance, B. Cooke - JPL, USA; Louise Prockter, Wes Patterson, T. Magner - Applied Physics Laboratory, USA.

14:30
IAA- WAS0215 Quark Matter in the Solar System: Evidence for a Game-Changing Space Resource
T.M. Eubanks, Asteroid Initiatives, USA.

14:45
IAA- WAS0216 International Cooperation at the Moon and Beyond
Jeffrey B. Plescia, Applied Physics Laboratory, USA; C. R. Neal, University of Notre Dame, USA.

15:00
IAA- WAS0217 Planetary Robotic Exploration and Opportunities for International Collaboration on Climate Change: A Comparative Climatology Case Study
Adriana Ocampo, Jeff Hollingsworth - NASA, USA; Mark A. Bullock, Southwest Research Institute, USA; Roger-Maurice Bonnet, International Space Science Institute, Switzerland; Lori Glaze, NASA Goddard Space Flight Center, USA; Sanjay Limaye, University of Wisconsin, USA; James A. Cutts, JPL, USA.

15:15
IAA- WAS0218 Affordable Human and Robotic Collaboration for Exploration Missions
James Crocker, Lockheed Martin, USA.

15:30
IAA- WAS0219 Terrestrial Analogues
Karen S. McBride, UCLA, USA; Claire Cousins, Vicky Hipkin, Gordon Osinski - CSA, Canada; Luis E. Eguiarte, Valeria Souza, Janet Siefert - Universidad Nacional Autónoma, Mexico; Douglas Galante, Universidade de Sao Paulo, Brasil; Mary Voytek, NASA, USA; Gian Gabriele Ori, IRSPS; David Pieri, JPL, USA; Andy Steele, Carnegie Institution of Washington, USA.

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15:45
IAA- WAS0220 International Living with a Star's Synergy with IAA

Barbara J. Thompson, Madhulika Guhathakurta - NASA, USA; Arnaud Masson, ESA/ESTEC, C. Philippe Escoubet - ESA/ESTEC, The Netherlands; Anatoli A. Petrukovich, Space Research Institute, Russia; Masaki Fujimoto, JAXA, Japan; David Kendall, CSA, Canada; Chi Wang, State Key Laboratory of Space Weather, China.

2014 IAA SPACE EXPLORATION CONFERENCE
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Session 3-A: Technical Factors: Enabling Technologies/Common Requirements

Thursday January 9, 2014 09:15-12:15

Location: Hemisphere Suite B

Session Chairs: Virginia Barnes, USA; Rafael Rodrigo, Spain

Rapporteur: John Sommerer, USA

09:15

IAA- WAS0301 Identification of Common Requirements and Enabling Technologies for Manned Solar System Exploration and Exploitation Using Spider Charts

R. Joseph Cassady, James Ellinthorpe, C. Russell Joyner, Daniel J. H. Levack, Thomas N. Martin III, Roger M. Myers - Aerojet Rocketdyne, USA.

09:30

~~IAA- WAS0310 Standards Based, Distributed Ground Data Systems for Future Missions~~

~~*David S. Lees, Carnegie Mellon Univ. Silicon Valley, USA; Matthew C. Deans, Trey Smith, Terrence W. Fong - NASA, USA; Tamar E. Cohen, Stinger Ghaffarian Technologies Inc., USA.*~~

09:45

IAA- WAS0302 Resource Prospector Mission (RPM): NASA's Robotic Lunar Lander Development

Cheryl L. B. Reed, Douglas A. Eng, Robert A. Summers, Katherine A. Stambaugh, Timothy G. McGee - The Johns Hopkins University Applied Physics Laboratory, USA; David J. Eisenman, Derek H. Calvert, Greg Chavers, Joshua M. Moore, Darryl W. May, Kim M. Ess, Irene M. Piatek - NASA, USA.

10:00

IAA- WAS0303 The Technical Aspects of Next-Generation Space Systems Creation Basing on On-Orbit Satellite Servicing Concept

Yury Makarov , Alexander Malchenko, Federal Space Agency, Russia; Yury Razoumny, Pavel Kozlov, Vladimir Razoumny, Cosmoexport Aerospace Research Agency, Russia; Jean-Michel Contant, IAA, France.

10:15

IAA- WAS0305 DFH-4 Based Communication Satellites

Zhou Zhicheng, China Academy of Space Technology (CAST), China.

10:30

IAA- WAS0306 Transformational Space Concepts and Technology for Future Human Exploration and Development of Space

John C. Mankins, Artemis Innovation Management Solutions LLC, USA; Peter L Garretson, Lt. Col, United States Air Force, USA.

10:45

IAA- WAS0307 Interdependence between Human Exploration beyond Earth Orbit and Life Support Systems Hardware Development

Gregory J. Gentry, Boeing, USA; Peggy L. Guirgis, Michael J. Heldmann - Hamilton Sundstrand Space Systems, USA.

11:00

IAA- WAS0308 Yuzhnoye Potential Contribution to Global Space Exploration

Olexandr Degtyarev, Olexandr Kushnarov, Volodymyr Shulga - Yuzhnoye, Ukraine; Oleg Ventskovsky, Yuzhnoye, Belgium.

11:15

IAA- WAS0311 Technologies for Human Space Exploration: Mission Dependence and Synergies

Giancarlo Genta, Politecnico di Torino, Italy.

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Session 3-B: Technical Factors: Enabling Technologies/Common Requirements

Thursday January 9, 2014 13:30-17:00
Location: Hemisphere Suite B
Session Chairs: Virginia Barnes, USA; Rafael Rodrigo, Spain
Rapporteur: John Sommerer, USA

13:30
IAA- WAS0312 IAA Status report on space debris
Fernand Alby, *CNES, France*.

13:45
IAA- WAS0313 The Contribution of IAA Orbital Debris Initiatives Over the Last Twenty Years
Darren McKnight, Integrity Applications Incorporated (IAI), USA.

14:00
IAA- WAS0314 Plutonium-238 Radioisotope Power Supplies: Enabling Deep-Space Missions
Ralph L. McNutt, Jr., Johns Hopkins University Applied Physics Laboratory, USA.

14:15
IAA- WAS0315 Demonstration High Power Solar Electric Propulsion Space Vehicle Can Advance the Current Timeline for a Human Spaceflight Mission to Mars to 2020
Dean Hawes, Travis Schrift - Applied Defense Solutions, USA; Roscoe Moore III, PeerSat, USA; Arthur Palisoc, L'Garde Inc., USA; Mitchell Walker, Thomas M. Liu - Georgia Institute of Technology School of Aerospace Engineering, USA; Michael Riesco, Sierra Nevada Corporation Space Systems, USA.

14:30
IAA- WAS0316 Nuclear power as an enabling technology for space exploration, activities in the UK
T. P. Tinsley, National Nuclear Laboratory, UK.

14:45
IAA- WAS0317 Space Nuclear Power Systems: Enabling Technology for Future Collaborative Exploration Missions
Richard Ambrosi, Hugo Williams, Nigel Bannister, University of Leicester, UK; Tim Tinsley, Tom Rice, Mark Sarsfield - National Nuclear Laboratory, UK; Brian Shepherd, Lockheed Martin, UK; Martin Townend, SEA House, UK; Jean-Pierre Roux, AREVA TA, France; Marie-Claire Perkinson, Astrium, UK; Piero Messidoro, Laura Gatti - Thales Alenia Space, Italy.

15:00
IAA- WAS0318 Architecture for the Exploration of the Edge of the Solar System (AXESS)
Amalia Ercoli Finzi, Michèle Lavagna, Nicolò Cattaneo, Michele Fani, Lorenzo Ferrario, Andrea Galbiati, Samuele Salvi - Politecnico di Milano, Italy.

15:15
IAA- WAS0319 Academy Cosmic Study on Feasibility of Space Elevators
Peter A. Swan, International Space Elevator Consortium; Cathy W. Swan, SouthWest Analytic Network; John M. Knapman, UK; David Raitt, UK; Robert E. Penny Jr., USA.

15:30
IAA- WAS0320 Human/UAV Mixed Teams for Mars Exploration. From analogs to reality
Gabriel G. De la Torre, Miguel A. Ramallo, Francisco J. Caballero – University of Cadiz, Spain.

15:45
IAA- WAS0321 Study of A Hybrid Locomotion Vehicle Using Skipping and Flying for Planetary Exploration
Mitsuhisa Baba, Waseda University, Japan; Larry Young, NASA, USA.

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Session 4-A: Private Industry's Role in Space Exploration and Exploitation: Technical, Policy, and Legal Considerations

Thursday January 9, 2014 08:45-12:15
Location: Meridian Suite
Session Chairs: Frans Von Der Dunk, the Netherlands; Christopher Ferguson , USA
Rapporteur: Rainer Sandau, Germany

09:15
IAA- WAS0401 The Exploration Development of Space "Engine"
Mark K. Craig, Science Applications International Corporation, USA.

09:30
IAA- WAS0402 What is really missing to Space Exploration : Money or Political/Public will?
Max Grimard, Astrium, France.

09:45
IAA- WAS0403 Examining the Diversity of Emerging Space Companies
Aliza M. Stein, Gregory C. Lee, Bhavya Lal - IDA Science and Technology Policy Inst., USA.

10:00
IAA- WAS0404 Earth to Orbit Space Transportation Market Barriers of Entry
Dustin Kaiser, Futron Corporation, USA; Ken Davidian, Federal Aviation Administration, USA.

10:15
IAA- WAS0405 Commercial Space Transportation Opportunities in Government Exploration Programs
George C. Nield, John Sloan, Nathan Johnson - Federal Aviation Administration, USA.

10:30
IAA- WAS0406 Regulation of Small Satellites: Challenges And Opportunities
Tanja Masson-Zwaan, International Institute of Air and Space Law, Leiden University, Netherlands.

10:45
IAA- WAS0407 Dream Chaser: Building on the Space Shuttle Legacy to Provide Safe, Affordable Transportation to Low Earth
Craig Gravelle, Sierra Nevada Space Systems, USA.

11:00
IAA- WAS0408 Low Earth Orbit Opportunities for Commercial Exploration
Keith Reiley, Boeing Space Exploration, USA.

11:15
IAA- WAS0409 Liability Issues Regarding Third-Parties and Space Flight Participants in Commercial Space Activities: The Pathway Forward
Matthew Schaefer, University of Nebraska College of law, USA.

11:30
IAA- WAS0410 Enterprise Rights, Environmental Protection, and the Law of Outer Space
Leslie I. Tennen, Patricia M. Sterns - Law Offices of Sterns and Tennen, USA; Frans G. von der Dunk, University of Nebraska-Lincoln, USA.

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Session 4-B: Private Industry's Role in Space Exploration and Exploitation: Technical, Policy, and Legal Considerations **Thursday January 9, 2014 13:30-17:00**
Location: Meridian Suite
Session Chairs: Frans Von Der Dunk, the Netherlands; Christopher Ferguson , USA
Rapporteur: Rainer Sandau, Germany

13:30	
IAA- WAS0411	Virtual Reality (VR) as scientific and educational exploration tool *Marcello Coradini, ESA/JPL; Enrico Flamini, ASI, Italy; Dennis Moura, CNES/Ambassade de France, France, Italy.*
13:45	
IAA- WAS0412	The Moon Protection As Common Heritage of Mankind *Peerapon Jaderojananont, Huachiew Chalermprakiet University, Thailand.*
14:00	
IAA- WAS0413	Providing for Sustainable Exploration and Use of Outer Space Environments:Making Profits Possible While Protecting Other Worlds is Not "Exploitation" *John D. Rummel, East Carolina University, USA; Pascale Ehrenfreund, Space Policy Institute G. Washington University, USA.*
14:15	
IAA- WAS0414	Space as a commons: Toward a framework for the allocation of extraterrestrial property rights *Robert D. Beney, Gordon Institute of Business Science, South Africa.*
14:30	
IAA- WAS0415	Road to The Space Elevator and Beyond - Proposal for International Corporation on Space Business Development *Yuichiro Nogawa, Akira Tsuchida, Kensuke Teranishi, Kazuya Imaki, Norio Fukui, Shigeru Imai, Yoshitaka Aizawa, Hiroki Shimizu, Chizuru Yokosuka, Hiroshi Ookita, Sakurako Takahashi, Riki Hoshikawa, - Japan Manned Space Systems Corp., Japan; Yoji Ishikawa, Tatsuhito Tamura, Kiyotoshi Otsuka, Takaya Horiike, Yasuhiro Fuchita, Yoshihiro Kawakami, Eri Omoto, Katsuhiko Shibuichi - Obayashi Corp., Japan; Chang Huai-Chien, University of Tokyo, Japan.*
14:45	
IAA- WAS0416	Long Term Space Propellant Depots *Giorgio Saccoccia, ESA; Lu Yu, China Academy of Launch Vehicle Technologies, China.*
15:00	
IAA- WAS0417	Moon Express: Lander Capabilities, Initial Payload and Mission *Paul D. Spudis, Lunar and Planetary Institute, USA; R. Richards, Moon Express Inc., USA; J.O. Burns, Univ. Colorado, USA.*
15:15	
IAA- WAS0418	Shackleton Energy Lunar Sourced Propellant Depot Architecture *Jim Keravala, Shackleton Energy Company, USA.*
15:30	
IAA- WAS0419	The Legal Aspects of Asteroid Missions *Christopher Daniel Johnson, International Institute of Space Law.*
15:45	
IAA- WAS0420	Bridgehead – Interplanetary Travel Becomes Routine *Derek Webber, Spaceport Associates, USA*
16:00	
IAA- WAS0421	Space Debris Removal: A Glance at Challenges and Opportunities *Amir S. Gohardani, Nathan C. Barnes - L·Garde Inc, USA.*
16:15	
IAA- WAS0422	ESA Coordination Activities on Space Exploration: Technology Roadmaps *Giorgio Saccoccia, Rolf de Groot, Bernhard Hufenbach – ESA.*

2014 IAA SPACE EXPLORATION CONFERENCE

PRELIMINARY PROGRAM

Session 5-A: Space Exploration: The Imperative of Global Cooperation

Thursday January 9, 2014 09:15-12:15
Location: Hemisphere Suite A
Session Chairs: Mike Raftery, USA; Randy Sweet, USA
Rapporteur: Kuninori Uesugi, Japan

09:15
IAA- WAS0501 International Industry Cooperation on Exploration from Earth-Moon L2
John Karas, VP & GM, Lockheed Martin Space Systems Company, USA.

09:30
IAA- WAS0502 Evaluation of Human Space Exploration Missions Beyond Low Earth Orbit
Oleg Alifanov, Moscow Aviation Institute, Russia; Robert Braun, Georgia Institute of Technology, USA; Edward Crawley, Skolkovo Institute of Science and Technology, Russia; John Logsdon, The George Washington University, USA; Lev Zelenyi, Space Research Institute, Russia; Jonathan Battat, Massachusetts Institute of Technology, USA.

09:45
IAA- WAS0503 Multicultural Foundations of Human Space Exploration. Lessons learnt and outlook for the future
Jacques Arnould, CNES, France; Jan Kolar, Czech Space Office, Czech Republic; Giuseppe Reibaldi, IAA, France.

10:00
IAA- WAS0504 The need for human exploration starting from the world as a base camp
Giovanni F. Bignami, INAF/IASF, Italy.

10:15
IAA- WAS0505 ExoMars: 2016 Mission Overview and Status
V. Giorgio, W. Cugno, C. Cassi - Thales Alenia Space Italia, Italy.

10:30
IAA- WAS0506 Role and visions for Human Space Exploration - A European perspective
Amir S. Rodrigo da Costa, Ulrich Kuebler, Bart Reijnen - Astrium, Space Transportation, Orbital Systems and Space Exploration, Germany.

10:45
IAA- WAS0507 Latin-American Regional Coordination in Space Exploration: a regional cooperative effort for space emerging nations
Raul Joya Olarte, Camilo Guzman - Sergio Arboleda University, Colombia; Adriana Ocampo, Mario Perez - NASA, USA; Javier Mendieta, Rosa Ma. de Arellano y Haro – Agencia Espacial Mexicana, Mexico; Corinne Jorgenson, Advancing Space, USA; Fernando Echavarria, U.S. State Department, USA; Fermin Romero, CEA, Mexico.

11:00
IAA- WAS0508 Building affordable and accessible space technology in Mexico and Latin-America to contribute to future space exploration missions
Enrique Pacheco-Cabrera, Francisco J. Mendieta-Jimenez, Rosa M. Ramirez-de-Arellano - Mexican Space Agency, Mexico.

11:15
IAA- WAS0509 Roscosmos-ESA Cooperation in Lunar Exploration
B. Patti, J. Carpenter, R. Fisackerly, B. Houdou, B. Hufenbach - ESA, The Netherlands; V. Hartov, V.Dolgopolov, A. Lukyanchikov - Lavochkin Association, Russia; A. Kozyrev, I.Mitrofanov, L. Zelenyi - Space Research Institute, Russia; V. Voron - Russian Federal Space Agency, Russia.

11:30
IAA- WAS0510 Space Mineral Resources – Opportunities and Challenges – Preliminary Findings and Recommendations
Arthur M. Dula, The Heinlein Prize Trust, University of Houston Law Center, USA.

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Session 5-B: Space Exploration: The Imperative of Global Cooperation

Thursday January 9, 2014 13:30-17:00
Location: Hemisphere Suite A
Session Chairs: Mike Raftery, USA; Randy Sweet, USA
Rapporteur: Kuninori Uesugi, Japan

13:30
IAA- WAS0511 White Cosmic Study on Global Human Mars System Missions Exploration
Giancarlo Genta, Politecnico di Torino, Italy; Alain Dupas, International Consultant, France; Jean-Marc Salotti, Laboratoire de Science Cognitive, France.

13:45
IAA- WAS0512 Advancing the Global Exploration Strategy – an update on ISECG activities
Christian Lange, Alain Ouellet - Canadian Space Agency, Canada.

14:00
IAA- WAS0513 Development Status of ESA Strategic Plan for Space Exploration
Bernhard Hufenbach, Rolf de Groot, Giorgio Saccoccia - ESA, European Space Research and Technology Centre (ESTEC), the Netherlands.

14:15
IAA- WAS0514 Creating Opportunities to Increase International Cooperation Between Lunar Human and Robotic Space Exploration Activities
Kathy Laurini, NASA, USA; Cheryl Reed, Johns Hopkins University Applied Physics Laboratory, USA.

14:30
IAA- WAS0515 Robotic and Human Space Exploration – The Importance of "Why?"
Marc Haese, Johann-Dietrich Wörner - DLR, German Aerospace Center, Germany.

14:45
IAA- WAS0517 NASA's Space Launch System: An Enabling Capability for International Exploration
Stephen D. Creech, Todd A. May, Kimberly F. Robinson - NASA Marshall Space Flight Center, USA.

15:00
IAA- WAS0518 International Industry Concepts for Human Space Exploration
Michael Raftery, Boeing, USA; Rodrigo Da Costa, Stephan Walther - EADS Astrium, Germany; Josh Hopkins, Lockheed Martin, USA; Paul Fulford, Nadeem Ghafoor - MacDonald Dettwiler, Canada; Ko Ogasawara, Mitsubishi Heavy Industries, Japan; Nikolay Bryukhanov, Yuri Makushenko, Alexander Derechin - RSC Energia, Russia; Flavio Bandini, Maria Antonietta Perino - Thales Alenia Space Italia, Italy; Luciano Saccani, Thales Alenia Space North America, USA.

15:15
IAA- WAS0519 Evaluating International Collaboration for Human Exploration Beyond LEO
Natasha Bosanac, Purdue University, USA; Alexander Burg, Ademir Vrolijk - The George Washington University, USA; Emanuele Capparelli, Skolkovo Institute of Science and Technology, Russia; Laura Delgado López, Institute for Global Environmental Strategies, USA; Koki Ho, Jonathan Battat - Massachusetts Institute of Technology, USA; Justin Kluger, University of Houston, USA; Sara M. Langston, University of Sydney, Australia; Valentina Lo Gatto, Sapienza University of Rome, Italy; Oleg G. Mansurov, National University of Science and Technology "MISIS", Russia; Paul Nizenkov, Universität Stuttgart, Germany; Luis Zea, University of Colorado – Boulder, USA.

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15:30
IAA- WAS0520 Dynamics of Space Exploration Activities and Outlook
Nicolas Peter, ESA, Belgium; Pascale Ehrenfreund, John Logsdon, Henry Hertzfeld - George Washington University, USA; Gerda Horneck, Stephan Ulamec - German Aerospace Center, Germany; Steve Mackwell, Lunar and Planetary Institute, USA; Jacques Masson, Giorgio Saccoccia, - ESA, Netherlands; Tanja Masson-Zwaan, International Institute of Space Law, Netherlands; Patrick Michel, Observatoire de Nice, France; Mazlan Othman, United Nations COPUOS, Austria; Serge Plattard, European Space Policy Institute, Austria; Cheryl Reed, Applied Physics Laboratory, USA; Kazuto Suzuki, Hokkaido University, Japan; Oleg Ventskovsky, Yuzhnoye Design Office, Russia, Belgium; Frances Westall, CNRS Orleans, France.

15:45
IAA- WAS0521 Space Exploration: Addressing the Challenges of Planetary Defense
William Ailor, Aerospace Corporation, USA; Richard Tremayne-Smith, Oos, UK.

16:00
IAA- WAS0522 IAA Symposium Report - The Future of Space Exploration : towards the Stars
Max Grimard, Astrium, France; Giovanni Vulpetti, Italy; Giancarlo Genta, Politecnico di Torino, Italy.

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Session 6-A: Space Stations Utilization for Robotics and Human Spaceflight Exploration

Thursday January 9, 2014 09:15-12:15
Location: Polaris Suite C
Session Chairs: Mark Mulqueen, USA; Michael Hawes, USA
Rapporteur: Anatoly Perminov, Russia

09:15
IAA- WAS0601 The International Space Station and Exploration
Sam Scimemi, Robyn Gatens, Steve Davison - NASA Headquarters, USA.

09:30
IAA- WAS0602 The Technical Characteristics of China 'Tiangong-1' Target Spacecraft
Yang Hong, Wei Chuanfeng - China Academy of Space Technology, China.

09:45
IAA- WAS0603 From ISS to Moon and Mars: The Space Station as Anchor Point for German Exploration Planning
Friedhelm Claasen, Jürgen Hill, Johannes Weppler, Norbert Henn - German Aerospace Center (DLR), Germany.

10:00
IAA- WAS0604 Concept of the Operational Techniques Applied to the Next Manned Space Flight Exploration Program Based on JEM Operation
Shuichi Ichimura, Kazuya Imaki, Riki Hoshikawa - Japan Manned Space Systems Corporation, Japan.

10:15
IAA- WAS0605 ISS as a Platform for Science and Exploration
Kevin Foley, Boeing Space Exploration, USA.

10:30
IAA- WAS0606 Utilization of the International Space Station as a Testbed for Crew-Controlled Lunar Surface Telerobotics
Terrence Fong, Intelligent Robotics Group, NASA, USA; Jack Burns, University of Colorado, USA; William Pratt, Lockheed Martin Corporation, USA; William Carey, ESA-ESTEC, the Netherlands.

10:45
IAA- WAS0607 Feasibility Study on the Missions to Earth-Moon Lagrange-Point 2 and the Moon using the HTV based Spacecraft
Tatsuhiro Nozue, Yoshihiko Uemura, Keiichi Miyamoto, Shin-ichi Amatatsu - Japan Manned Space Systems (JAMSS), Japan.

11:00
IAA- WAS0608 Microgravity Science in Malaysia - achievements and the way forward
Mhd Fairos Asillam, National Space Agency of Malaysia, Malaysia.

11:15
IAA- WAS0609 Space Station Proof Tests for Lunar Plant Growth
James D. Burke, The Planetary Society, USA; Kathleen M. Coderre, Lockheed Martin ISS Operations, USA; Andrea Jaime Albalat, Space Generation Advisory Council, Austria.

11:30
IAA- WAS0610 Additive Manufacturing on ISS and Beyond: A Critical Enabling Technology For Successful Human Space Exploration
Michael Chen, Jason Dunn, Aaron Kemmer, Michael Snyder - Made in Space Inc., USA.

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Poster Session

IAA- WASPO01 Medicine for Space Exploration: Setting the Bar High for Biomedical Innovations
Dorit B. Donoviel, Jeffrey P. Sutton - National Space Biomedical Research Institute (NSBRI) and Baylor College of Medicine Center for Space Medicine, USA.

IAA- WASPO02 Affording Mars: Results from a Community Workshop on Sustainable Initial Human Missions
Harley Thronson, NASA Goddard Space Flight Center, USA; Chris Carberry, Explore Mars Inc., USA; Jim Kirkpatrick, American Astronautical Society, USA.

IAA- WASPO03 The International Space Weather Initiative
Madhulika Guhathakurta, NASA Headquarters, USA; Nat Gopalswamy, Joseph M. Davila - NASA Goddard Space Flight Center, USA.

IAA- WASPO04 Lunar Science and Exploration Goals for Robotic Missions The Moon as the Rosetta Stone of Planetary Evolution
Jeffrey B. Plescia, Applied Physics Laboratory, USA; C. Neal, University of Notre Dame, USA.

IAA- WASPO05 Scientific Robotic Lunar Missions, as Precursors for Future Human Exploration of the Moon
Lev Zelenyi, Igor Mitrofanov - Institute for Space Research, Russia; Viktor Khartov, Vladimir Dolgopolov, Alexandr Lukjanchikov - Lavochkin Association, Russia; Nikolay Brukhanov, Korolev RSC Energia, Russia;

IAA- WASPO07 Small-Scale Radioisotope Thermoelectric Generator Systems Based on Americium-241
Richard Ambrosi, Hugo Williams, Piyal Samara-Ratna, Nigel Bannister, David Vernon, Tony Crawford, Jonathan Sykes - University of Leicester, UK; Kevin Tomkins, Marie-Claire Perkinson, Matthew Stuttard, Stephen Pulker, Richard Slade - Astrium Ltd, UK; Keith Stephenson, ESA, ESTEC TEC-EP, The Netherlands; Kevin Simpson, Mark Robbins, Ismini Dimitriadou - European Thermodynamics Ltd, UK; Mike Reece, Huanpo Ning, Kan Chen- Queen Mary University, UK; Tom Rice, Tim Tinsley, Mark Sarsfield- National Nuclear Laboratory, UK; Jan Koenig, Martin Jaegle - Fraunhofer IPM, Germany.

IAA- WASPO08 High Energy Mission on Pegasus
Warren Frick, Orbital Sciences Corporation, USA.

IAA- WASPO09 Modular Design Framework for the Multi-Mission Space Exploration Vehicle Generation IIB Electrical Harnessing
Christopher R. Halcon, California Polytechnic State University – San Luis Obispo, USA.

IAA- WASPO11 Overview and Outcomes of CSA Concept Studies for Space Exploration Planning and
Christian Lange, Taryn Tomlinson, Alain Ouellet, Canadian Space Agency, Canada.

IAA- WASPO12 Enabling Fast Interplanetary Trips with High Performance Nuclear Propulsion
Roger Lenard, Planetary Power Inc., USA.

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IAA- WASPO13 Asteroids: The Time is Now
Srija, The George Washington University, USA.

IAA- WASPO16 Using High-Energy Orbits to Efficiently Extend Human Exploration to Interplanetary Destinations with Reusable Spacecraft
David W. Dunham, Robert Farquhar - KinetX, USA; Natan Eismont, Space Research Institute, Russia; Eugene Chumachenko, Sergey Aksenov, Yulia Fedorenko - Moscow Institute of Electronics and Mathematics, National Res. Univ. "Higher School of Economics", Russia; Roberto Furfaro, John Kidd, Jr., Nathan Mogk - University of Arizona, Aerospace and Mechanical Engineering, USA.

IAA- WASPO18 Modeling, Simulation, Inversion and Data Validation for Microwave Remote Sensing of Space Exploration: Moon and Mars
Ya-Qiu Jin, Key Laboratory for Information Science of Electromagnetic Waves (MoE), Fudan University, China.

IAA- WASPO19 Solar Sailing and the Hurdles of Space Exploration and Exploitation
Nathan C. Barnes, Amir S. Gohardani – L'Garde Inc., USA.

IAA- WASPO20 Research Cooperation About Condensing Mars's Atmosphere By Asteroid Impacts Effects
Mohammad Hussein Fazeli, General Amir Medical Clinic, Iran.

IAA- WASPO21 The cooperation for space exploration in Latin America, progress and challenges
Camilo Guzman Gomez, Sergio Arboleda University, Colombia.

IAA- WASPO22 The Trouble With Mir: Orthogonal Motivations and Cooperation in Space
Trent L. Schindler, Space Policy Institute George Washington University, USA.

IAA- WASPO23 Treaty Making- culture and human society
Amalie Sinclair, Leeward Space Foundation, USA.

IAA- WASPO24 Libertad 2 Mission: Overview, Goals and Challenges
Jorge Soliz, Raul Joya, Jesus Gonzalez, Ronald Hurtado, Freddy Diaz - Universidad Sergio Arboleda, Colombia.

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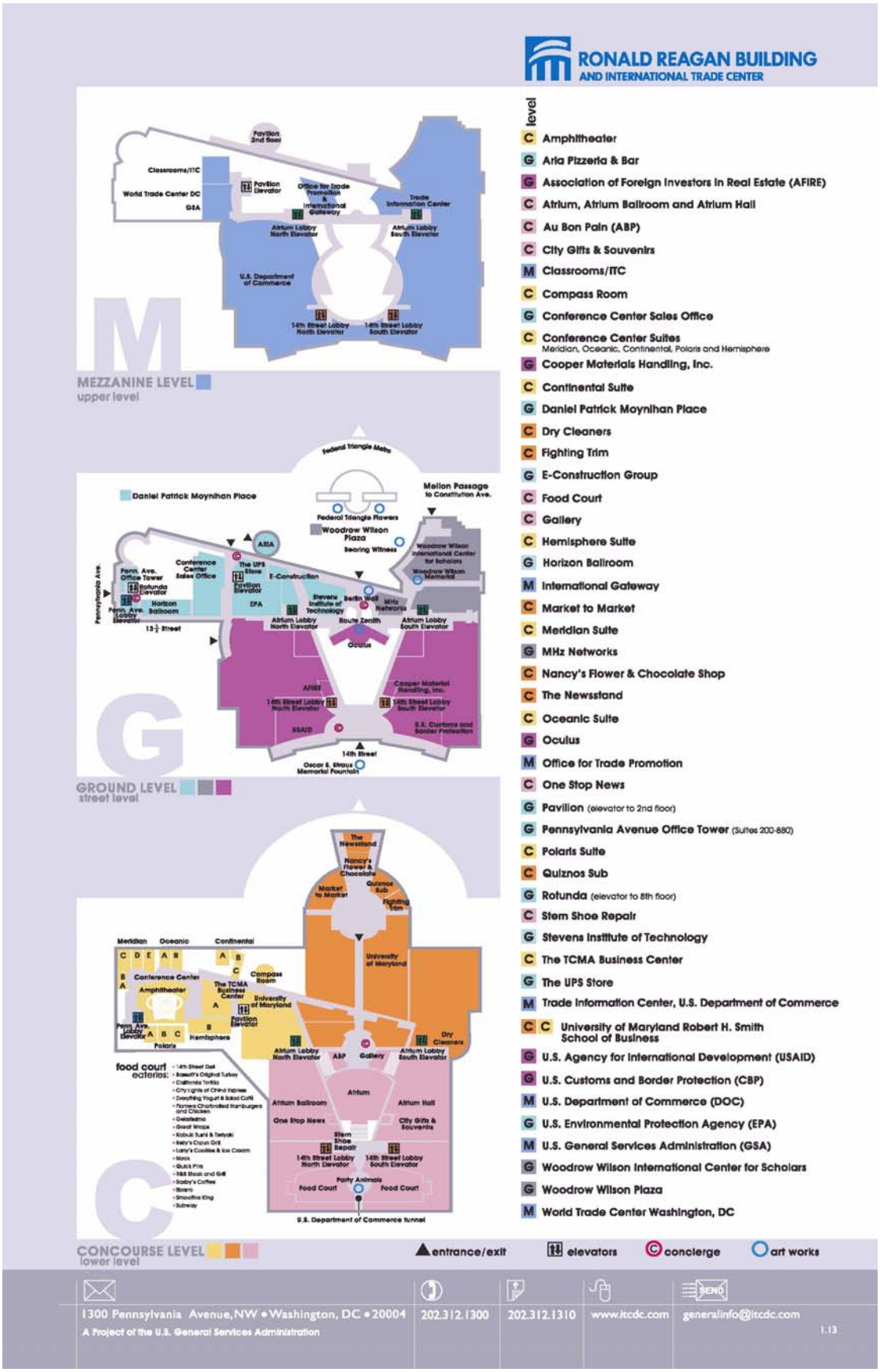
Map of the Conference Rooms



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