3rd IAA Conference on University Satellite Missions Cubesat Workshop & International Workshop on Lean Satellite Standardization (IWLS2)

November 30th - December 5th, 2015
Palazzo Rospigliosi
Rome, Italy

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www.gaussteam.com
The event is sponsored by:

- International Academy of Astronautics (IAA)
- Group of Astrodynamics for the Use of Space Systems (Gauss)
- Kyutech (Kyushu Institute of Technology)
- European Space Agency (ESA)
- PCL
With the participation of:

HYPERION TECHNOLOGIES

Astro- und Feinwerktechnik Adlershof GmbH

Tyvak International
A Terran Orbital Corporation
### Committees

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<td>Klaus Schilling <em>(Germany)</em></td>
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<td>Chantal Cappelletti <em>(Brazil)</em></td>
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<tr>
<td>Filippo Graziani - <em>IAA Member, Senior Professor, G.A.U.S.S. Srl President</em></td>
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<td>Paolo Teofilatto - <em>IAA Member, Dean of the School of Aerospace Engineering</em></td>
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<td>Riccardo Di Roberto - <em>G.A.U.S.S. Srl</em></td>
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Monday, November 30th, 2015

09:45-10:00  Welcome Address - Filippo Graziani (GAUSS Srl)
Opening Remarks - Antonio Sposito (ASI)

10:00-10:45  Opening Lecture - Jean-Michel Contant (IAA): The IAA and Small Satellites
For The Young Generations
IAA Members Induction

10:45-11:30 Invited Lecture - Vladimir Andreev (ISC Kosmotras): ISC Kosmotras. Dnep
Program. 15 Years at the World Launch Services Market

11:30-11:50 Coffee-break

11:50-13:00 Invited Lecture - Amalia Finzi (Polimi), Emanuele Di Sotto (GMV): Rosetta:
Le Nostre Ali Sulla Coda Di Una Cometa

13:00-14:30 Lunch

14:30-18:00 Afternoon sessions:

Session: Space Missions Overview

IAA-CU-15-01-16 Five Nations CubeSat Constellation: An Inexpensive Test Case For Learning And
Capacity Building - Arifur R. Khan, George Maeda, Hirokazu Masui, Mengu Cho - Kyshu Institute of Technology

IAA-CU-15-01-18 QB50 Project: An Enabler Of Harmonization And Standardization Of CubeSat
Platforms - Paride Testani, Jan Theoemel, Amandine Denis, Thorsten Scholz, Davide
Masutti - Von Karman Institute

Santos Cupertino Durão, Nelson Jorge Schuch - INPE-National Institute for Space
Research, INPE/CRS - National Institute for Space Research/South Regional Center

IAA-CU-15-01-43 A Remote Controllable Thermovacuum Facility For Cubesats And Small
Payloads - Claudio Paris, Giampiero Sindoni - Centro Fermi, Sapienza University of Rome

IAA-CU-15-01-47 UWE - Lessons Learned And Future Perspectives - Philip Bangert, Slavi
Dombrovski, Alexander Kramer, Klaus Schilling, Stephan Busch - University of Würzburg

16:00-16:20 Coffee-break

IAA-CU-15-01-48 Approach And Perspectives Of The Italian Space Agency For Mini And
Microsatellites - Luigi Ansalone, Claudia Facchinetti, Francesco Longo, Giancarlo
Varacalli, Roberto Formaro - ASI-Italian Space Agency

IAA-CU-15-01-49 Multi-User Satellite Operations - Rayan Imam, Yang Gao - University of Khartoum,
University of Surrey

IAA-CU-15-01-58 Inverse Dynamics Particle Swarm Optimization For Nanosatellites Rendezvous
Via Differential Drag - Dario Spiller, Fabio Curti - Sapienza University of Rome

IAA-CU-15-01-63 Main Directions Of Yuzhnoye’s Activity In Nanosatellite Technology - Bilousov
Kostiyan, Zaitzeva Anchela, Dotcenko Oleh - Yuzhnoye SDO

Session: New Perspectives in the Application of Microsatellites

IAA-CU-15-04-67 University Earth Remote Sensing Satellite - Anatolii Kulabukhov, Oleg Klochkov -
Dnepropetrovsk National University
**Tuesday, December 1st, 2015**

**09:30-10:15** *Invited Lecture - Benjamin Malphrus (MSU):* Lunar IceCube: Prospecting The Moon For Water Ice

**10:15-11:00** *Invited Lecture - Mikhail Ovchinnikov (KIAM):* Big Goals For Small Spacecraft: Missions To The Moon, Asteroids, Planets, And Interstellar Space. Dynamical Aspects

**11:00-11:45** *Invited Lecture - Paolo Teofilatto (SIA):* Launchers For Responsive Space

**11:45-12:05** Coffee-break

**12:05-13:20** Morning sessions:

*Session: Launch Opportunities for University Missions*


*Session: Ground Segment and Station Networks*

- **IAA-CU-15-03-05** A Linux Based Software Defined Radio (SDRs) For Amateur Ground Stations - Aaron Yankey - All Nations University College
- **IAA-CU-15-03-14** ESEO Ground Segment Software Solutions: Design, Implementation And Testing - Marco Bosco, Paolo Tortora - University of Bologna
- **IAA-CU-15-03-19** Design and Implementation Of The TIGRISAT Ground Station - Yousra Fakhri Noori, Nabeel Abdualhussian Salman - Ministry of Science and Technology, Iraq
- **IAA-CU-15-03-59** Center Of Space Services In The Ryazan Region. Regional Aspect - Soldatov Victor Vasilevich, Antipova Olga Victorovna - Ryazan State Radio Engineering University

**13:20-14:50** Lunch

**14:50-17:55** Afternoon sessions:

*Session: Space Debris*

- **IAA-CU-15-05-03** Space Debris Removal - Hari Shankar R L, Purnima Narayanan - IGNOU, Pune University
Numerical Simulation Of Space Debris - Khaled Alhussan - King Abdulaziz City for Science and Technology

**Session: CubeSat Pavloids**

A Pilot Experiment Definition On CubeSat Class Of Innovative Design For A New Class Of Magnetic Field Sensors-Actuators Based On The Mechanism Of Hydration - Giuseppe Rondinelli, Brunella Pavesi, Antonella De Ninno - Telespazio, ENEA


**16:35-16:55 Coffee-break**

The Cosmic X-Ray Background NanoSat-2 (CXBN-2): Results From An Improved X-Ray Detector For CubeSats - Roger McNeil, Benjamin Malphrus, Jordan Healea, Sean McNeil - Morehead State University

Combination Of Capillarity And EWOD Microfluidic Technology For Biomedical Space Research - Pablo Rodriguez Llorca, Marco Nardecchia, Giampiero de Cesare, Domenico Caputo, Augusto Nascetti - Sapienza University of Rome

**Session: Interplanetary CubeSat Perspectives**

Sampled-Data Stabilization Around The L2 Translunar Libration Point - Lorenzo Ricciardi Celsi, Raffaello Bonghi, Salvatore Monaco, Dorothée Normand-Cyrot - Sapienza University of Rome, Laboratoire des Signaux et Systèmes, CNRS-Supelec

**Wednesday, December 2nd, 2015**

**09:30-10:15 Invited Lecture - Jordi Puig-Suari (Tyvak): CubeSats And NanoSats: The Next Generation**

**10:15-11:00 Invited Lecture - Fernando Aguado (UVigo): Satellite Communication Systems Based On Small Satellite Platforms**

**11:00-11:45 Invited Lecture - Piero Galeone (ESA): ESA Education Office - Programme Opportunities for University Students**

**11:45-12:05 Coffee-break**

**12:05-13:20 Morning sessions:**

**Session: CubeSat SubSystems**

Micro-Cathode Arc Thruster For Cube Satellite Propulsion - Michael Keidar - George Washington University

A Simple Attitude Controller For Staring Imaging Satellite - Yijun Lian, Yudong Gao, Guoqing Zeng - National University of Defense Technology

Optimal Gains For Attitude Stabilization Of Spacecraft Using Magnetorquers - Fabio Celani, Renato Bruni - Sapienza University of Rome

**13:20-14:14 Lunch**

**14:50-17:55 Afternoon sessions:**

JumpSat Thermal And Mechanical Analysis - Eduardo Martin Lopez, Stéphanie Ligy-Destrez - DNM/AESS2-Space Systems, Space Systems Design and Operations
IAA-CU-15-07-23 Design And Realization Of A Reconfigurable S-Band Patch Antenna System For Cubesat Satellites - Erika Pittella, Stefano Pisa, Hussein Hadi, Alee K. Obied, Naheel Salman, Mauro Pontani, Paolo Teofilatto, Augusto Nascetti - Sapienza University of Rome

IAA-CU-15-07-24 Control System for a Microsatellite Reaction Wheel - Dmitry Pritykin, Nikita Ilev, Anton Sivkov, Alexander Popov, Ruslan Sergeev, Sergey Efimov, Dmitry Prodan, Alexey Nozdrin - Moscow Institute of Physics and Technology, Sputnix Ltd.

16:35-16:55 Coffee-break

Session: LeanSat Standard and Testing


IAA-CU-15-11-41 Tackling Development Hurdles In CubeSat Projects - Tim Lock - European Space Agency


Thursday, December 3rd, 2015

09:30-10:15 Invited Lecture - Klaus Schilling (University of Würzburg): Pico-Satellite Formations: Achieving Interesting Performance In Orbit By Cooperation

10:15-11:00 Invited Lecture - Mengu Cho (Kyutech): Update On International Standardization On Lean Satellites

11:00-11:20 Coffee-break

11:20-13:00 Morning sessions:

Session: LeanSat Standard and Testing


IAA-CU-15-11-54 Agile Development And Testing Approach And Results For The Aalto Series Nanosatellites - Tuomas Tikka, Antti Kestilä, Bagus Riawanto, Nemanja Jovanovic, Jaan Praks - Aalto University


Session: CubeSat Subsystems

IAA-CU-15-07-26 Simplifying CubeSat Mission: Magnetic Attitude Control Example - Dmitry Koldugin, Mikhail Ovchinnikov, Benjamin Malphrus, Anatoly Petrakovich - Keldysh institute of Applied Mathematics RAS, Morehead State University, Space Research Institute of RAS


13:00-14:30 Lunch
14:30-17:40 Afternoon sessions:


IAA-CU-15-07-50  TVAC Tests And Integration Of QB50 ADCS To BeEagleSat  -  Sibel Turkoglu, Mehmet Sevket Uludag, Alim Rüstem Aslan  -  Istanbul Technical University


16:15-16:35 Coffee-break

Session: CubeSat Activities Overview


IAA-CU-15-06-38  International Collaboration and CubeSat Research at Taiwan  -  Jyh-Ching Juang, J. J. Miau, Steven Chen  -  National Cheng Kung University, Taiwan, National Space Organization

IAA-CU-15-06-40  6DOF ADCS Air-Bearing Testbed  -  Julio Gallegos, Pedro Vallejo, Fernando Martin, Xavier Dupac, Tim Lock  -  European Space Agency

IAA-CU-15-06-45  The Integration And Testing Of UBAKUSAT  -  Alim Rüstem Aslan, Mengu Cho, Mehmet Sevket Uludag, Bogaç Karabulut, Mustafa Erdem Bas, Mehmet Deniz Aksulu, Mustafa Karatas, Erdinç Yakut, Murat Suer  -  Istanbul Technical University, Turkish Amateur Satellite Technologies Organization, Kyushu Institute of Technology, ERTEK Space LTD., GUMUSH Space Ltd.

IAA-CU-15-06-50  The Construction Of A CubeSat With Additive Manufacturing: Racetrack To Orbit An Additive Revolution  -  Stewart Davis  -  CRP USA
Friday, December 4th, 2015

**International Workshop on Lean Satellite Standardization**

09:30-9:45 *Introduction*

9:45-10:15 *Keynote presentation on Lean Satellite concept*

10:15-10:45 *Round-Table Discussion on lean satellite concept*

10:45-11:15 *Exercise on lean satellite scale*

11:15-11:35 *Coffee-break*

11:30-12:00 *Feedback to lean satellite scale*

12:00-13:00 *Round-table discussion on requirements*

13:00-14:30 *Lunch*

14:30-16:00 *Round-table discussion on requirements*

16:00-16:15 *Other standardization issues*

16:15-16:35 *Coffee-break*

16:35-17:00 *Conclusions*

17:00-20:00 *Cheese & Wine Party*
Photovoltaic Power Supply with Supercapacitors - Adrian Done - University "Stefan cel Mare" Suceava

A Technique to Improve the Quality of your CubeSat Project - Tim Lock - European Space Agency

Calibration and Testing of Aalto-1 Attitude Determination and Control System - Bagus Adiwiluhung Riawanto, Tuomas Tikka, Antti Kestilä, Nemanja Jovanovic, Jaan Praks - Aalto University


A Novel Tracking Method of the Sun-Synchronous Satellite Using UHF Antenna - Guofu Wu, Guoqiang Zeng, Haitao Shui, Fu Yuan - National University of Defense Technology

A New Design Method for the On-Board Computer of Micro Satellites - Haitao Shui, Zhijun Li, Guofu Wu, Guoqiang Zeng - National University of Defense Technology