AIDAA - ITALIAN ASSOCIATION OF AERONAUTICS AND ASTRONAUTICS
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Facoltà di Ingegneria Civile e Indistriale
Sapienza University of Rome

"Nanosatellite Systems and Missions"

ABSTRACT

Nanosatellite-based missions open new scenarios and pose new challenges in strategic planning, in mission design, spacecraft manufacturing, ground testing, launch and early orbit operations, ground segment and control centers, space debris mitigation and protection. These systems, intended typically below 50-100kg, allow for complex distributed and largely autonomous architectures, exploiting advances in on-board computing systems and sensor/actuators performance improvements and miniaturization.

This symposium addresses all the aspects of recent advances in nanosatellite systems missions, opening the discussion in highlighting the potentials and drawbacks in the practical implementation of nanosatellite-based missions, including lessons learned in:

- missions, applications and nanosatellite-enabled concepts, both in near-Earth and deep space environments, for government, science and large public services, demonstrating the value of single nanosatellites and their distributed systems, such as constellations (eventually including *mega-constellations*) and formations
- nanosatellite system design, manufacture and engineering, including innovative assembly, integration and test procedures
- specific onboard systems development, enhancing reliability, cost effectiveness and performance
- innovative cost-effective operations
- affordable and reliable access to space
- standardization concepts in mechanical and electronics on-board systems

Reports on missions in advanced development or recently accomplished are highly welcome.

Chair:
Fabio Santoni

SYMPOSIUM N.10

NANOSATELLITE SYSTEMS AND MISSIONS

Chaired by Prof. Fabio Santoni
Dipartimento di Ingegneria Astronautica, Elettrica ed Energetica
Sapienza University of Rome

Keynote Speaker

Prof. Mengu Cho
Kyushu Institute of Technology
Kitakyushu, Japan

LEAN SATELLITE: DELIVERING SATELLITES' VALUES WITH LOW COST AND SHORT TIME

MORNING

Paper N. 1 Ianelli S., Albano M., Di Clemente M., Gabrielli A., Cantoni S., De Stefano Fumo M., Votta R., Fedele A., Gardi R. , Cardi M, Corradino F, Villa M., Carrai F., Carubia F.
ENABLING NEW ORBIT SERVICES FOR MANNED AND UNMANNED SPACE VEHICLES WITH THE NEXT GENERATION OF DRONES: THE IPERDRONE PROGRAM

Paper N. 2 R. Fortezza, A. Ceriello, D. De Simone, G. Di Costanzo, D. Castagnolo, C. Albanese, A. Vincenzi - **U-DRAGON: UNIFIED - DISTRIBUTED ADVANCED GLOBAL OPERATIVE NETWORK FOR NANO AND MICRO SATELLITE OPERATIONS**

Paper N. 3 F. Stesina, S.Corpino, D.Calvi, G.Saccoccia, J. Gonzales Del Amo, E. Bosch Borras - **DESIGN AND VALIDATION OF A CUBESAT TEST PLATFORM FOR THE VERIFICATION OF MINIATURIZED ELECTRIC PROPULSION SYSTEMS**

Paper N. 4 Simone Pirrotta, Fabrizio Piergentili, Fabio Santoni, V. di Tana, L. Burderi, F. Fiore, M. Lavagna, J. Brucato. - **ASI CUBESAT-BASED MISSIONS FOR SCIENTIFIC INVESTIGATIONS**

Paper N. 5 Vincenzo Stanzione, Beatrice Sabbatinelli, Daniele Filippetto Francesco Morsillo
EARTH OBSERVATION IN NEW SPACE ECONOMY: CONSTELLATIONS OF SMALL SATELLITES

AFTERNOON

Paper N. 6 Rachna Dandwani, Sanmukh Khadtare, Nayana Mitti, Hrithik Patil - **PASSIVE ATTITUDE CONTROL USING A NEODYMIUM MAGNET AND VISCOUS-HYSTERETIC DAMPERS FOR RVSAT-1**

Paper N. 7 Silvia Molinini, Fabrizio Stesina, **ANALYSIS OF THE DOCKING PHASE BETWEEN TWO CUBESATS USING A PERMANENT-MAGNET DOCKING MECHANISM**

Paper N. 8 Francesco Topputo, **LUMIO CUBESAT: TOWARD A LUNAR SITUATIONAL AWARENESS**

Paper N. 9 Kathiravan Thangavel, Maurizio Parisse, **AN ISOTHERMAL ANALYSIS OF 6UPOCKET CUBE SATELLITE**

Paper N. 10 Elisabetta Giustini, Angelo Raffaele Bibbo, Fabrizio Cacciotti, Mauro Mollicone, Giuseppe Sciscione, Mario Zanna, F.Santoni, A.Delfini, R.Pastore, D.Amadio, M.Marchetti - **DESIGN AND MANUFACTURING OF GALILEI CUBESAT : A NANO-SATELLITE FOR HIGH SCHOOL AND UNIVERSITY HANDS-ON EDUCATION**

Paper N.11 Rachna Dandwani, Sanmukh Khadtare, Nayana Mitti, Hrithik Patil - **COMPARATIVE RESEARCH ON PASSIVE MAGNETIC STABILIZATION OF NANOSATELLITES USING HYSTERESIS DISCS AND HYSTERESIS RODS**

Paper N. 12 Anton Bahu, Dario Modenini, Giacomo Curzi, Paolo Tortora, **A DYNAMIC ATTITUDE TESTBED FOR CUBESATS**