



SAPIENZA  
UNIVERSITÀ DI ROMA



ITALIAN  
TECHNION  
ASSOCIATION

## **IAA – ITALY – ISRAEL WORKSHOP ON NANOSATELLITE TECHNOLOGIES**

Under the patronage of  
Italian Space Agency ASI, Israel Space Agency ISA and International Academy of Astronautics IAA

**ASI (Agenzia Spaziale Italiana), Via del Politecnico - Rome, Italy**

**April 9-10, 2018**

### **Call for Participation**

Nanosatellites and related technologies have been gaining increasing interest in the space sector, due to the numerous possibilities they convey to space missions. Building on the active collaboration between Italy and Israel in the space field, a joint 2-day workshop will be held in Rome, which will accentuate the strengths and experience of each country in nanosatellite research and development. The workshop will be held under the sponsorship of the Italian Space Agency (ASI) and Israeli Space Agency (ISA).

During the first day of the workshop, participants from each side will present research activities relevant to nanosatellite technologies. Such activities include, but are not limited to, the following topics:

1. New attitude control devices
2. Astrodynamics and orbit control
3. New mission concepts
4. Miniaturized electric propulsion systems
5. Cluster flight and formation flying
6. Subsystem design
7. Inter-satellite communication
8. Imaging, optics and remote sensing
9. Novel materials, additive layer manufacturing and 3D printing
10. On board computers, sensors, and timing devices
11. New applications and services produced by nano satellites
12. Augmentation of large satellite systems performances due to nano satellites

The second day will be devoted to round-table discussions, with the purpose of encouraging Israeli and Italian research institutions to develop academic relationship and to carry out joint research projects.

Prospective participants are requested to send the **confirmation of their attendance** and **the participation to the social dinner** by **April 4** by sending an e-mail to:

(for Italian participants) Mr Roberto Formaro [roberto.formaro@asi.it](mailto:roberto.formaro@asi.it) and Prof. Paolo Gaudenzi [paolo.gaudenzi@uniroma1.ut](mailto:paolo.gaudenzi@uniroma1.ut)

(for Israeli participants) Prof. Pini Gurfil, [pgurfil@technion.ac.il](mailto:pgurfil@technion.ac.il)

### **Motivations and contents of the workshop**

The workshop aims at strengthening the cooperation between Italy and Israel in the space sector by approaching the opportunities offered by small and Nano satellite systems. Space systems based on small and Nano platforms, especially if considered in the frame of constellations and formations, are considered very promising from the perspective of enhanced performance of space systems both for scientific missions and for applications. Issues as standardization, new concept of operations, advanced and cooperative flight control systems, miniaturization, additive manufacturing, launching opportunities and ground segment terminals are topics that are under investigation in both countries and can offer innovative solutions to the entire space sector .

In the workshop the policies by both National space agencies will be illustrated and the major programs in development in the Universities and Research centers will be presented, along with major developments and programs developed by Italian and Israeli companies. One of the aims of the workshop is to pave the line towards a cooperative program in small/Nano satellites.

### **Programme**

#### **1st day Monday 9 of April**

9.00: Registration

9.15: **Inaugural session**

9.15: *Address by ASI President Prof. Roberto Battiston*

9.30: *Address by ISA Director Mr. Avi Blasberger*

9.45: *Address by IAA (TBD)*

10.00: *Keynote by Prof. Pini Gurfil (Technion)*

10.20: *Keynote by Prof. Paolo Gaudenzi (Sapienza)*

10.40: Coffee break

11.00: **First Working session - The contribution by Space Agencies and Space Industry**

11.00: *The Italian small satellite programs, Roberto Formaro, ASI*

11.20: The view on small/nano satellites by Italian industry

1. SMALL SATELLITES INTO THE SPACE ECONOMY: INNOVATIVE TECHNOLOGIES, INNOVATIVE SERVICES, INNOVATIVE FUNDING SCHEMES – NICOLA ZACCHEO, SITAEL
2. MICROSATELLITES: TAS-I VISION – LEONARDO MAZZINI, TAS-I
3. THE NEW SPACE “HIGHWAYS”: HOW TO SUPPORT THE SMALLSAT TRAFFIC HAVING A FULL PICTURE ALWAYS UPDATED - MARCO BRANCATI, TELESPAZIO
4. THE FOURTH WAVE IN SPACE SYSTEMS EVOLUTION; DEMOCRATIZATION OF SPACE, TECHNOLOGY CHALLENGES AND NEW BUSINESS MODELS - STATUS OF PLAY – MASSIMO COMPARINI, E-GEOS

12.20: The view on small/Nano satellites by industry, the Israeli viewpoint, Israel Space companies

5. ON BOARD COMPUTERS IN SMALL SATELLITES – F. LANGE, RAMON CHIPS
6. RESEARCH IN MICROGRAVITY– Y. FUECHTWANGER, SPACEPHARMA

13.00: *Launching opportunities, the Vega option for small/nanosat – Augusto Cramarossa, ASI*

13.20: Lunch

14.20: **Second Working session - The contribution by Universities and Research Inst.**

1. DEVELOPMENT OF MINIATURE PLASMA THRUSTERS AT THE AEROSPACE PLASMA LABORATORY – I. KRONHAUS, TECHNION
2. QUANTUM COMMUNICATION EXPERIMENT IN A SMALL SAT MISSION – L. IESS, F. SCIARRINO, F. PIERGENTILI, UNIVERSITÀ DI ROMA LA SAPIENZA
3. DISTRIBUTED SYNTHETIC APERTURE RADAR BY COMPACT FORMATION FLIGHT SATELLITES – G. FASANO, M. GRASSI, M. D. GRAZIANO, A. MOCCIA, R. OPROMOLLA, A. RENGA, G. RUFINO, S. SARNO, UNIVERSITÀ DI NAPOLI FEDERICO II
4. NANOSATELLITES FOR CELL CULTURE TESTING IN SPACE – A. NASCETTI, P. TEOFILATTO, UNIVERSITÀ DI ROMA LA SAPIENZA
5. BGUSAT AS A RESEARCH PLATFORM – S. MAMAN, A. SADON, A. STERN, D. CHOUKROUN, G. WEISS, S. ROTMAN AND D. BLUMBERG, BEN GURION UNIVERSITY OF THE NEGEV

10.40: Coffee break

6. SPACE ENGINEERING AND MICRO/NANO SATELLITES RESEARCH ACTIVITIES AT UNIVERSITY OF BOLOGNA – D. MODENINI, P. TORTORA, UNIVERSITÀ DI BOLOGNA
7. OPTIMIZED DESIGN METHODS FOR CONSTELLATIONS OF NANOSATELLITES – G. PALERMO, P. GAUDENZI, UNIVERSITÀ DI ROMA LA SAPIENZA
8. LEDSAT: A CUBESAT TEST LEDs BASED TECHNOLOGY IN ORBIT – F. PIERGENTILI, F. SANTONI, P. MARZIOLI, D. AMADIO, G. CIALONE, F. CURIANÒ, L. FREZZA, A. GIANFERMO, A. GROSSI, S. MASILLO, A. PELLEGRINO, P. SEITZER, UNIVERSITÀ DI ROMA LA SAPIENZA

17.40: Summary of the day by organizers

18.00: Closing of the first day

20.30: Social dinner in Rome

## 2nd day Tuesday 10 of April

9.20 : **Third Working session - New application and services based on small satellites, standardization, integration with programs based on large systems**

The contributions of small companies

Italian companies

1. **HERCULES: A LOCKSTEP – CPU ON BOARD COMPUTER – M. TRUGLIO, A. C. RODRIGUEZ, F. GRAZIANI, GAUSS**
2. **THE D-ORBIT ION CUBESAT CARRIER: AN INNOVATIVE APPROACH TO CUBESATS DEPLOYMENT AND DISPERSION – S. ANTONETTI, D-ORBIT**

Israel companies:

3. **UTILIZING BLOCKCHAIN TECHNOLOGY FOR DISTRIBUTED SATELLITE MISSION CONTROL IN NANO-SATELLITE CONSTELLATION – E. MARCUS, IMAGE SAT INTERNATIONAL**
4. **NEW HORIZONS FOR MICRO-PROPULSION FOR NANOSATELLITES AND CUBESATS, J. HERSCOVITZ, RAFAEL ADVANCED DEFENSE SYSTEMS**

10.20 : Coffee break

10.40 : **Fourth Working session - The contributions of the Universities and research inst. (2)**

1. **INTRODUCTION OF INNOVATIVE ADDITIVE MANUFACTURING TECHNOLOGIES INTO THE NANOSATELLITES DESIGN AND REALIZATION – A. BOSCHETTO, M. EUGENI, L. BOTTINI, V. CARDINI, G. GRATEROL NISI, L. POLLICE, P. GAUDENZI, UNIVERSITÀ DI ROMA LA SAPIENZA**
2. **PHOTONIC TECHNOLOGY FOR NANOSATELLITES – C. CIMINELLI, F. DELL’OLIO, G. BRUNETTI, D. CONTEDEUCA, N. SASANELLI, M. N. ARMENISE, POLITECNICO DI BARI**
3. **CUBESAT MISSIONS AT POLI TO: LESSONS LEARNT AND FUTURE DEVELOPMENTS – S. CORPINO, POLITECNICO DI TORINO**

11.40: **Concluding session – Roundtable on promoting cooperation and on possible joint program on small/Nano sat**

12.40: Concluding remarks by organizers

13.00: End of the workshop