

## **TITOLO: Space Debris**

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### **ABSTRACT**

This symposium will address the complete spectrum of technical issues of space debris including:

- **space surveillance and measurements** based on advanced ground and space-based measurement techniques, relating processing methods, and results of space debris characterization. Moreover this topic will address the multiple aspects associated to safe operations in space dealing with space debris, including operational observations, orbit determination, catalogue build-up and maintenance, data aggregation from different sources, relevant data exchanges standards and conjunction analyses.
- **modelling, risk assessment in space and on the ground, re-entry**. This topic addresses the characterization of the current and future debris population and methods for in-orbit and on-ground risk assessments including collision risk estimates based on statistical population models and deterministic catalogues.
- **hypervelocity impacts and protection** will address disruptions of spacecraft operations induced by hypervelocity impacts. Further topics are spacecraft impact protection and shielding studies, laboratory impact experiments, numerical simulations, and on-board diagnostics to characterize impacts such as impact sensors, accelerometers, etc.
- **mitigation and standards, post-mission disposal, debris removal**, including the implementation of debris prevention and reduction measures and vehicle passive protection at system level including end of life strategies and tools to verify the efficiency of the implemented measures. Moreover, this topic addresses post-mission disposal and active removal techniques “ground and space based”.

## **SYMPOSIUM N. 14**

### **SPACE DEBRIS**

**Chaired by Prof. Fabrizio Piergentili**

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**Paper N. 1 LIDAR-BASED RELATIVE NAVIGATION IN CLOSE-PROXIMITY OF UNCOOPERATIVE KNOWN SPACECRAFT**

A. Nocerino, R. Opromolla, M. Grassi, G. Fasano, G. Rufino

**Paper N. 2 RADAR MULTIBEAM TECHNOLOGY APPLIED TO SPACE SURVEILLANCE IN THE LEO REGIME**

Matteo Losacco, Mauro Massari, Pierluigi Di Lizia, Germano Bianchi, Giuseppe Pupillo, Andrea Mattana, Giovanni Naldi, Claudio Bortolotti, Mauro Roma, Marco Schiaffino, Federico Perini, Luca Lama, Denis Cutajar, Josef Borg, Fabio Monaci

**Paper N. 3 SPACE-BASED DETECTION OF ORBITING OBJECTS BY USING STAR SENSORS**

F. Curti, V. Schiattarella, D. Spiller, D. Luchena, C. Facchinetti, L. Ansalone, A. Tuozzi

**Paper N. 4 THE SAPIENZA SCIENTIFIC OBSERVATORY NETWORK: ACTIVITIES OVERVIEW AND RECENT DEVELOPMENTS**

Marco Acernese, Leonardo Parisi, Gaetano Zarcone, Shariar Hadji Hossein, Lorenzo Mariani, federico Curianò, Fabio Santoni, Fabrizio Piergentili

**Paper N. 5 LEDSAT: A LED-BASED CUBESAT FOR CALIBRATION OF OPTICAL SPACE DEBRIS TRACKING AND ATTITUDE RECONSTRUCTION**

Paolo Marzioli, Andrea Gianfermo, Lorenzo Frezza, Diego Amodio, Federico Curianò, Patrick Seitzer, Fabrizio Piergentili, Fabio Santoni

**Paper N. 6 NUMERICAL ANALYSIS OF FRAGMENTS GENERATED AFTER SPACECRAFT COLLISIONS**

Francesconi A, Giacomuzzo C, Olivieri L, Sarego G.

**Paper N. 7 SAMPLING-BASED STRATEGY FOR ON-ORBIT SATELLITE INSPECTION**

M. D. Vitolo, M. Maestrini, P. Di Lizia