

GUSDON

Global University Space Debris Observation Network

Group Discussion Final Presentation

Eleonora Vestito, Jose Ricardo Campos Mora, Fabio Santoni, Alessio Piergiacomo, Pierluigi Federici, Hiroto Seki, Yukihiro Kitazawa

7th UNISEC Global Meeting


30 November - 3 December 2019, Tokyo University

Tokyo, Japan



SAPIENZA
UNIVERSITÀ DI ROMA





Why space debris observation is important

- ☐ Collision avoidance
- ☐ Re-entry prediction to reduce casualty risk
- ☐ Active debris removal: attitude is very important
- ☐ Monitor space environment changes

Main point emerged: starting from students

- ❑ Promote **local** and **international competitions** in space debris observation
- ❑ **Hands-on** education and **practical experience** in space debris observation (as done with satellites)
- ❑ Organize short **full-immersion courses** (1/2 weeks) focused on theoretical and practical implementations open to all students
- ❑ Approach to space debris community for **seeking collaboration, research and educational opportunities** with UNISEC

For example

Evidence what happens if we **do not monitor** the space environment, allowing new generations to be aware of risks.



Generate global interest





How to involve institutions

- ☐ Data sharing, agreements and policy
- ☐ Applications of data gathered
- ☐ Make standard freeware/software tools (e.g. image analysis, orbital determination, lightcurve inversion) and shared hardware architectures available

Potential benefits with respect to present infrastructure

- Technological demonstration/capacity building
- Standard components for observatories at lower costs
- Complementarity with large existing infrastructure in terms of weather conditions, longitude/latitude distributions
- Better observation of geostationary objects
- Multiple point observation for better orbital determination and mostly lightcurve inversion
- Shared interests with practical astronomy
- Increase of interest in the future for monitoring of special orbital regimes such as electrical orbit rising satellites to GEO
- Reconfigurability and flexibility of small observatories

Design nanosatellites bearing «trackability» in mind

- Seek for new technologies to improve nanospacecraft identification at low cost and tracking using telescopes (e.g. LEDs) in multi-satellite launches

