

**40th COSPAR Scientific Assembly,  
2-10 August, 2014, Moscow, Russia**

**Report to IAA Space Debris Committee**

T. Schildknecht, PEDAS Chair

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# COSPAR 2014 PEDAS Event

## Space Debris – Responding to a Dynamic Environment

### ■ Debris Measurements

Chairs: Toshifumi Yanagisawa, Toshifumi Yanagisawa

- report on ground-based optical observations in MEO
- report on design of ground-based optical observation system for LEO
- report on ISON network
- 3 reports on image processing/detection algorithms

### ■ Debris Environment Modelling

chairs: Carmen Pardini , J.-C. Liou

- report on laboratory-based satellite impact experiments
- 2 reports on LEO environment evolution simulations
- 3 reports on HVI and shielding



# COSPAR 2014 PEDAS Event

## Space Debris – Responding to a Dynamic Environment (cont.)

### ■ Debris Orbit Dynamics, Cataloguing

Chairs: Florent Deleflie , Thomas Schildknecht

- report on chaos detection in S.D. population
- 3 reports on (initial orbit) determination
- report on conjunction analysis (China)
- 2 reports on orbit evolution (HEO resonances, MEO disposal orbits)
- report on tools used in KIAM space debris data center

### ■ Debris Mitigation and Remediation, SSA

Chairs: Christopher Kebschull, Seishiro Kibe

- re–entry prediction
- risk reduction by design for demise
- space–based optical surveillance demonstrator
- disposal strategies for GEO Beidou
- de–tumbling of upper stages using Eddy currents
- ADR cost estimates



# COSPAR 2014 PEDAS Event

## Space Debris – Responding to a Dynamic Environment

- **Statistics of PEDAS at COSPAR 2014:**
  - 4 half-day sessions, plus 1 poster session
  - presentations: oral/posters  $\Rightarrow$  32/15
  - withdrawals  $\Rightarrow$  4 (3 late)/0; no-shows  $\Rightarrow$  ?/?
- **Venue of COSPAR 2016:**  
Istanbul, Turkey, 30 July – 7 August 2016
- **COSPAR 2016 announcement:** see special issue of “Space Research Today” (tentatively in Aug. 2015)



# PEDAS Organization (1)

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## 1. Discussion of scientific matters & coordination

- joint session on SSA with PEDAS, and NEO community, and/or other dedicated PEDAS session for 2016?

## 2. Election/appointment of PEDAS officers

- Thomas Schildknecht (CH, chair and MSO): 2014 to 2018
- Seishiro Kibe (JP, vice-chair and DO): 2013 to 2017

## 3. Proposals for COSPAR meetings

- PEDAS event proposal for COSPAR2016, Istanbul, Turkey:  
**Space Debris – Providing the Scientific Foundation for Action**
- 4 half-day sessions plus posters requested for PEDAS



# COSPAR 2016 PEDAS Event

## Space Debris – Providing the Scientific Foundation for Action

The PEDAS1 sessions on space debris will address advances in ground- and space-based observations and methods for their exploitation, in-situ measurement techniques, debris and meteoroid environment models, debris flux and collision risk for space missions, on-orbit collision assessment, re-entry risk assessments, debris mitigation and debris environment remediation techniques and their effectiveness with regard to long-term environment stability, national and international debris mitigation standards and guidelines, hypervelocity accelerator technologies, and on-orbit shielding concepts.

***Interdisciplinary/multidisciplinary papers on space weather and near Earth objects are particularly encouraged.*** The target audience of the event is researchers, spacecraft and launch system manufacturers, operators of space systems, mission and system analysts, space policy makers and insurance underwriters. Four half-day sessions of 9 to 10 presentations each are planned, with 1 to 2 solicited papers per session. PEDAS1 space debris sessions typically have an audience of about 100. Papers can be submitted for publication in *Advances in Space Research*.



# PEDAS–Related Publications

## 4. Preparation and publication of ASR manuscripts

- ASR has become an Elsevier “open scientific journal”, with no further event–related proceedings
- “Astrodynamics and Space Debris” (AD) is one of 9 themes
  - P. Willis (Editor–in–Chief),
  - T. Schildknecht (Assoc. Editor)
- manuscripts can be submitted at any time to “<http://ees.elsevier.com/asr>”;
- manuscripts for ASR will be peer reviewed

## 5. COSPAR report to the UN

- the United Nations has discontinued the *Highlights in Space* report which used to appear biannually
- PEDAS is requested to provide input for, e.g., the COPUOS and the COPUOS WG on Long–term Sustainability of Outer Space Activities



# PEDAS Organization (2)

## 6. Outstanding paper award for young scientists

- nominee must be younger than 31, and first author
- contributed papers and posters are eligible
- submissions not presented at COSPAR are eligible
- closing date for nomination: 6 months before next COSPAR meeting
- **PEDAS outstanding paper award:**  
**Charles Hubaux (University of Namur): *Influence of Earth's shadowing effects on space debris stability***