International Academy of Astronautics
IAA Space Debris Committee
March 28th, 2022
1. IAC – Administrative part
   1.1. IAA Space Debris Committee
   1.2. Lessons learned from Dubai 2021
   1.3. General statistics concerning Space Debris Symposium A6
   1.4. Status of Space Debris Symposium for Paris 2022
   1.5. Preparation of Space Debris Symposium for Baku 2023

2. Exchanges
   2.1. Past events: workshops, conferences, congresses, …
   2.2. On the Agenda
   2.3. General information
   2.4. Round table – Open discussion

3. IAA Study Groups
   3.1 SG 5.17 IAA Situation Report on Space Debris
1.1 IAA Space Debris Committee

General frame:

- Officially created within IAA in 2012
  - Independent Committee
  - Permanent Committee
  - Attachment to Commission V. Could be independent if it would present any interest

Actions of the Committee:

- Position Paper on Orbital Debris in 1993, revised in 2000
- Position Paper SG 5.1 on Space Debris Mitigation in 2006
- Position Paper SG 5.5 on Space Debris Remediation in 2013
- Participation to SG 5.10 on Orbital Debris Removal: Policy, Legal, Political and Economic considerations
- Participation to SG 4.23 on Post-Mission Disposal for Micro and Smaller Satellites: Concepts and Trade Studies
- Review of the SG 5.15 on Space Traffic Management, finished and published
- Situation Report Paper 2016 SG 5.14 finished and distributed
- Situation Report Paper 2019 SG 5.17 on going
- Numerous presentations (UNCOPUOS, …)
1. IAA Space Debris Committee

Membership:
No need to be member of IAA!
- Members of the IAA A6 Symposium Program Committee (chairs & rapporteurs)
  ⇒ Note that the IAC Program Committee is exclusively selected among the IAA SDC members
- Members of the Program Committee of other IAA sponsored conferences with Space Debris concerns
- Members of Space Debris related working groups (IADC, UNCOPUOS, COSPAR, ISO …)
- Academics, Labs, Universities, Industrials… working on the topic

However, it is requested to be “active”:
- Participation to the meetings
- Debriefing of activities during the meetings
- Cross information with other members
- Contribution to studies and reports
- To see the work which is done, visit our web page
  https://iaaspace.org/about/permanent-committees/#SA-PERMCspacedebris

Two meetings per year:
- One during IAC ⇒ Includes the status of the sessions, workshops, round tables… of the week
- One during IAC March Meeting ⇒ Includes the pre-selection of the abstracts for the following IAC
1. IAA Space Debris Committee

Current membership:
Agapov Vladimir
Aglietti Guglielmo
Ailor William
Alby Fernand
Anilkumar A.K.
Anselmo Luciano
Anz-Meador Philip
Auburn John
Berend Nicolas
Bevilacqua Riccardo
Brachet Gerard
Christiansen Eric L
Colombo Camilla
Crowther Richard
Dasgupta Upasana
Dolado Perez Juan-Carlos
Faucher Pascal
Finkleman David
Fitz-Coy Norman G.
Flohrer Tim
Francesconi Alessandro
Francillout Laurent
Gong Zizheng
Grishko Dmitriy
Hanada Toshiya
Howard Diane
Hyde James
Jah Moriba K.
Jankovic Marko
Kawamoto Satomi
Kelso T. S.
Kerr Emma
Kibe Seishiro
Kim Hae-Dong
Kitazawa Yukihito
Krag Holger
Lemmens Stijn
Letizia Francesca
Liou Jer-Chyi
Martinez Peter
Martinot Vincent
Marzoli Paolo
Masson-Zwaan Tanja
McKnight Darren S.
Metz Manuel
Nassisi Annamaria
Oltrogge Daniel L.
Omaly Pierre
Opromolla Roberto
Pardini Carmen
Piergentili Fabrizio
Plattard Serge
Rossettini Luca L.
Sanchez-Ortiz Noelia
Santoni Fabio
Schaefer Frank
Schildknecht Thomas
Seitzer Pat
Shen Lin
Singh Balbir
Siminski Jan
Skinner Mark
Smith Lesley-Jane
Somma Gian Luigi
Sorge Marlon E.
Spencer David B.
Stokes Hedley
Traineau Jean-Claude
Tung Helen
Usovik Igor
Wiedemann Carsten
Yasaka Tetsuo

Chairs & Secretary:
Bevilacqua Riccardo
Bonnal Christophe
Omaly Pierre

Note:
Members in italics are not yet mentioned on the IAA website...
Complex process...

To be removed?
Klinkrad Heiner
Flury Walter

New members?
Bastida-Virgili Benjamin

Synthesis:
75 members

It is reminded that Program Committee (Chairs + Rapporteurs) is selected among members only

See appendix 1 for today’s list of participants
1.2 Feedback from Dubai 2021

Number of IAC abstracts since 2008
1.3 General statistics concerning A6

Globally healthy symposium:
- Average 195 papers submitted every year: large variations (standard deviation last 10 years = 47.2)
- Very good rejection rate: average last 10 years 51%
- Very good presentation rate: average (2012-2019) = 81%
1.3 General statistics concerning A6

A6.1: Space Debris Detection, Tracking and Characterization - SST

Very healthy session over the years
28 papers submitted in average
63% rejection rate
59.3 average average attendance
15.6% withdrawn (wo 2020). 2% no show in average

<table>
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<th>Min Att</th>
<th>Max Att</th>
<th>Avg Att</th>
<th>Papers Subm</th>
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Beware: no 2020
1.3 General statistics concerning A6

A6.2: Modeling and Risk Analysis
Good “classical” session
23 papers submitted in average but steadily declining (14 in 2021)
51% average rejection rate but declining (29% in 2021)
But very good average average attendance 58 participants
7.2% withdrawn (wo 2020). 1.8% no show in average (wo 2020)
Potential action to improve the submission number
Potential rewording of the call

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1.3 General statistics concerning A6

A6.3: Impact-Induced Mission Effects and Risk Assessments

Still a problematic session…

Low number of submission: 16 but only 6 in 2021, 10 in 2020, 13 in 2019…

31% average rejection rate but declining (15% in 2019, 0% in 2020 and 2021)

Rather good average average attendance 28 participants

19% notified withdrawn. 13% no show in average

Potential action to redefine this session

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<td>68%</td>
<td>19%</td>
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</table>
1.3 General statistics concerning A6

A6.4: Mitigation - Tools, Techniques and Challenges – SEM

Good classical session with strong variations

Low number of average submission: 15, slightly better in 2021

33% average rejection rate but declining (but 45% in 2021)

Good average average attendance 50 participants

9.5% notified withdrawn (wo 2020). 3% no show in average
1.3 General statistics concerning A6

A6.5: Post Mission Disposal and Space Debris Removal 1 - SEM

Very good classical session (dual session with A6.6)
Medium number of average submission: 24 (= 52 for A6.5 + A6.6)
Good rejection rate 57% (47% in 2021)
Good average average attendance 54 participants
Significant decrease in attendance in 2021
7% withdrawn (wo 2020). 5.7% no show in average (wo 2020)
A6.6: Post Mission Disposal and Space Debris Removal 2 - SEM

Very good classical session (dual session with A6.5)

Good number of average submission: 28 (= 52 for A6.5 + A6.6)

Good rejection rate 63%

Very high average average attendance 76 participants,

⇒ But very strong decrease in attendance in 2021

17% withdrawn (wo 2020). 7% no show in average (wo 2020)

⇒ But very poor marks in 2021
1.3 General statistics concerning A6

A6.7: Operations in Space Debris Environment, Situational Awareness - SSA

Good classical session since 2014
Average submission is rather low: 15
Rejection rate is correct: 35%
Good average average attendance: 43 participants
9% withdrawn (wo 2020). 5% no show in average (wo 2020)
⇒ But poor marks in 2021
1.3 General statistics concerning A6

A6.8-E9.1: Political, Legal, Institutional and Economic Aspects of Space Debris Mitigation and Removal - STM Security

Very good session with increasing success
Average submission rate: 17 (but 26 since 2018)
Rejection rate is correct: 37% (but 63% in 2021)
Good average average attendance: 40 participants
High withdrawn ratio 22% (wo 2020). High no show 6% (wo 2020)
Potential need to improve contact with authors
1.3 General statistics concerning A6

A6.9: Orbit Determination and Propagation - SST

“Similar definition with A6.1”
Low submission rate: 14, stable over the years
Low rejection rate: 25%
But good average average attendance: 42 participants
High withdrawn ratio 19% (one anomaly in 2015!).
Low number of no show: 1% (wo 2020)
Potential need to redistribute with A6.1
1.3 General statistics concerning A6

Synthesis of A6:

Good symposium, steady over the years
Very good participation rate, with a global average over the years of 48 per session, but decreasing
Some sessions still appear somehow problematic, as A6.3
Some loss of interest in A6.5 and A6.6
But to be analyzed in more depth to take into account the location of the congress
 nộp Room for improvement for some session definitions for Baku 2023
We are number 1 this year 😊… Does it mean people get more concerned about Space Debris?
1.4. General information Paris 2022

Number of abstracts, Space Debris Symposium, since 2008
A6: Space Debris Symposium: Bevilacqua – Bonnal
The Symposium will address the complete spectrum of issues associated to space debris, including orbital sustainability and operations in debris dominated environment. It will cover every aspect of Space Environment Management (SEM) including Mitigation and Remediation measures, Space Surveillance and Tracking (SST), Space Situational Awareness (SSA), Space Traffic Management (STM), including all aspects of measurements, modelling, risk assessment in space and on the ground, re-entry, hypervelocity impacts and protection, mitigation and standards, post-mission disposal, remediation, debris removal, Space Surveillance, collision avoidance as well as non-technical topics associated to space debris dominated environment.

This session will address every aspect of SST (Space Surveillance and Tracking), advanced ground and space-based measurement techniques, relating processing methods, and results of space debris characterization.

A6.2: Modelling and Risk Analysis: Sorge – Oltrogge – Pardini
This session will address the characterization of the current and future debris population and methods for in-orbit and on-ground risk assessments. The in-orbit analysis will cover collision risk estimates based on statistical population models and deterministic catalogues, and active collision avoidance.

This session addresses disruptions of spacecraft operations induced by hypervelocity impacts including spacecraft anomalies, perturbation of operations, component failures up to mission loss, and spacecraft fragmentations. It includes risk assessments for impact vulnerability studies and corresponding system tools. 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.
A6.4: Mitigation - Tools, Techniques and Challenges - SEM: Omaly – Kawamoto – Krag
This session will focus on the Mitigation part of the SEM (Space Environment Monitoring), implementation of debris prevention and reduction measures; vehicle passive protection at system level including end of life strategies and tools to verify the efficiency of the implemented measures. The session will also address practical experiences in the planning and verification of measures and issues and lessons learnt in the actual execution of mitigation actions.

A6.5: Post Mission Disposal and Space Debris Removal 1 - SEM: Singh – Opromolla – Francillout
This session will focus on the Remediation part of the SEM, dealing with ADR (Active Debris Removal), JCA (Just in time Collision Avoidance), LDTM (Large Debris Traffic Management) among solutions. It will address post-mission disposal and active removal techniques “ground and space based”, review potential solutions and identify implementation difficulties.

A6.6: Post Mission Disposal and Space Debris Removal 2 - SEM: Jankovic – Grishko – Auburn
This session will focus on the Remediation part of the SEM, dealing with ADR (Active Debris Removal), JCA (Just in time Collision Avoidance), LDTM (Large Debris Traffic Management) among solutions. It will address post-mission disposal and active removal techniques “ground and space based”, review potential solutions and identify implementation difficulties.

A6.7: Operations in Space Debris Environment, Situational Awareness - SSA: Martinot – Kelso – Sanchez-Ortiz
This session will address the multiple aspects associated to STM (Space Traffic Management) and SSA (Space Situational Awareness) including safe operations in space dealing with Space Debris, operational observations, orbit determination, catalogue build-up and maintenance, data aggregation from different sources, relevant data exchanges standards and conjunction analyses.

From SDC: Spencer – Masson-Zwaan – Kerr  
From SSC: Plattard - Soucek

This session will address all non-technical aspects of Operations and Security in a Debris Dominated Environment. This STM session will mainly include the non-technical aspects of space debris mitigation and removal. Political, legal and institutional aspects include role of IADC and UNCOPUOS and other multilateral bodies. Economic issues include insurance, financial incentives and funding for space debris mitigation and removal. The role of international cooperation in addressing these issues will be considered.

A6.9: Orbit Determination and Propagation - SST

Siminski – Dolado-Perez – Marzioli

This session will address every aspect of orbit determination coming from the SST (Space Surveillance and Tracking), related to assessment of raw and derived data accuracy, optical measurements processing and modelling and risk analysis of space debris.

A6.10 / E10.2: Joint “Near Earth Objects & Space Debris” – SSA

From SDC: Schildknecht – McKnight – Colombo  
From NEO: Mazanek – Haddaji – Maier

This Artificial and natural space debris pose a growing concern while the awareness about hazards associated with Earth-crossing asteroids and comets is increasing. The rising number of artificial satellite objects in LEO, HEO, GEO as well as cis-lunar space, the potential for a rapid increase in the associated collisional debris could cause long-lasting impediments if not explored further. Similarly, Near-Earth Objects (NEOs) span sizes from micrometeorites to km-scale objects, posing a potential hazard to people and property both in space and on Earth.

This Joint Session aims to explore common aspects of these challenges by inviting papers that...

A6.IP: Interactive Presentations,  
Kerr – Letizia – Marzioli – Opromolla – Jankovic – Bonnal

Update following paper selection: we have selected 83 IPs ≅ 9 screens ➞ Need for 9 to 18 volunteers!
1.4. Space Debris Symposium for Paris 2022

Updated following the abstracts selection

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noelia.sanchez.ortiz@gmail.com
### 1.4. Space Debris Symposium for Paris 2022

Updated following the abstracts selection

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| Total Oral | 306 | 95 | 3 | 39 | 92 | 83 | 229 |
| Total with IP | 312 | 95 | 3 | 39 | 92 | 83 | 312 |
1.4. Space Debris Symposium for Paris 2022

Selection of abstracts:

- Technical Sessions are reduced from 3 hours to 2.5 hours
  - An oral presentation should not be below 15 minutes, Q&A and Transfer included
    - No strict rule from IAF – Decision of the Chairs and Rapporteur
    - But, please do not go down to 10 minutes or so, as we will get plenty of complaints (quite usual…)
      - Typically 10 Oral per Session
  - We can select up to 5 Back-ups per Session
    - Automatically “promoted” in case of Withdrawn
    - Automatic transfer to IP for the non promoted (except if explicitly asking for Oral)
  - We can have as many IPs as we want: no limit in number of screens: **Probable need for additional Chairs for A6.IP**
    - But an author asking explicitly for Oral can not be selected as IP (some exceptions are possible)
    - And an author asking explicitly for IP can not be selected as Oral
  - When proposing a transfer from an Oral session to IP, please check quality:
    - The IP chairs do not want to redo the selection
    - If a paper is transferred to IP, it will be selected
  - Please make sure to keep a good “IAF 3G” balance, but no strict rules of course
    - Generation: Select some student papers
    - Geography: Usually too many Europeans and US
    - Gender
Selection process:

One excel file per session
Coordinate among chairs & rapporteurs
For instance: rating form 0 to 5 (bad to excellent), then average
Stick to Excel sheets as long as the process is not over
- Transfer: contact the others before proposing, except if transfer to A6-IP
- Reject: must explain briefly why
- Paper order for the session
- Paper length = 150 minutes / Number IP: let's wait until everyone is finished

Formalization on the web site:

Classical under “Responsibility areas”
Same information requested:
   Easy if well prepared in advance – I can do
Beware: operation cannot be undone
1.4. Space Debris Symposium for Paris 2022
1.4. Space Debris Symposium for Paris 2022

General planning for Paris:

- 6 constraints
  - 10 Sessions over 9 time slots → 2 sessions on the same time slot, as usual
  - IADC: Tuesday? Who manages? A room shall be booked and the list of participants established
    - Beware: IAC Paris is from Sunday to Thursday, not Monday to Friday
    - Solved meanwhile… No IADC session in Paris due to postponement of regular IADC meeting in Korea to October
  - Special Session IAF TC.26 on STM is Sunday afternoon. Decision to modify to Tuesday afternoon; precise slot TBD between 2 possibilities
  - Joseph P. Loftus Jr. Invited Lecture
    - Don Kessler
    - Takes 2 slots, (total = 30 minutes) at the beginning of one session; no preference from Don
  - Additional 45 minute IP session on Monday “1 minute pitch”. Very successful in Dubai ⇒ Need for one volunteer
  - New 45 minute IP session on Tuesday “Late Breaking IP”. Will require selection + one volunteer to follow.

- Discussion
  - What is the order of our sessions?
    - Last years’ order was as below. It was decided to change it to the new version below in red (blue last year for comparison):

    _Mo.pm A6.1 – Tu.am A6.9 – Tu.pm A6.4 – We.IADC – We.am SPS – We.am A6.3 – We.pm A6.2 – Th.am A6.5 – Th.pm A6.6 – Fr.am A6.8 – Fr.pm (A6.7 & A6.10)_

    _Su.pm A6.7 – Mo.am A6.9 – Mo.pm A6.4 – Tu.am A6.3 – Tu.pm A6.2 – Tu.pm SPS – We.am A6.5 – We.pm A6.6 – Th.am A6.8 – Th.pm (A6.1 & A6.10)_

  - Which session welcomes the Keynote Lecture? Decision following discussions: First 2 slots of A6.3
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**A6: Space Debris Symposium: Bonnal – Bevilacqua – Omaly**

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It will cover every aspect of Space Environment Management (SEM) including Mitigation and Remediation measures, Space Surveillance and Tracking (SST), Space Situational Awareness (SSA), Space Traffic Management (STM), including all aspects of measurements, modelling, risk assessment in space and on the ground, re-entry, hypervelocity impacts and protection, mitigation and standards, post-mission disposal, remediation, debris removal, Space Surveillance, collision avoidance as well as non-technical topics associated to space debris dominated environment.


This session will address every aspect of SST (Space Surveillance and Tracking), advanced ground and space-based measurement techniques, relating processing methods, and results of space debris characterization.

**A6.2: Modelling and Risk Analysis: Sorge – Oltrogge – Pardini**

This session will address the characterization of the current and future debris population and methods for in-orbit and on-ground risk assessments. The in-orbit analysis will cover collision risk estimates based on statistical population models and deterministic catalogues, and active collision avoidance.

**A6.3: Impact-Induced Mission Effects and Risk Assessments: Kitazawa McKnight – Gong – Traineau?**

This session addresses disruptions of spacecraft operations induced by hypervelocity impacts including spacecraft anomalies, perturbation of operations, component failures up to mission loss, and spacecraft fragmentations. It includes risk assessments for impact vulnerability studies and corresponding system tools. 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.
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This session will focus on the Remediation part of the SEM, dealing with ADR (Active Debris Removal), JCA (Just in time Collision Avoidance), LDTM (Large Debris Traffic Management) among solutions. It will address post-mission disposal and active removal techniques “ground and space based”, review potential solutions and identify implementation difficulties.

A6.6: **Post Mission Disposal and Space Debris Removal 2 - SEM:** Jankovic – Grishko – Auburn
This session will focus on the Remediation part of the SEM, dealing with ADR (Active Debris Removal), JCA (Just in time Collision Avoidance), LDTM (Large Debris Traffic Management) among solutions. It will address post-mission disposal and active removal techniques “ground and space based”, review potential solutions and identify implementation difficulties.

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This session will address the multiple aspects associated to STM (Space Traffic Management) and SSA (Space Situational Awareness) including safe operations in space dealing with Space Debris, operational observations, orbit determination, catalogue build-up and maintenance, data aggregation from different sources, relevant data exchanges standards and conjunction analyses.
From SDC: Spencer – Masson-Zwaan – Kerr  From SSC: Plattard – Soucek?
This session will address all non-technical aspects of Operations and Security in a Debris Dominated Environment. This STM session will mainly include the non-technical aspects of space debris mitigation and removal. Political, legal and institutional aspects include role of IADC and UNCOPUOS and other multilateral bodies. Economic issues include insurance, financial incentives and funding for space debris mitigation and removal. The role of international cooperation in addressing these issues will be considered

A6.9: Orbit Determination and Propagation - SST
Siminski – Dolado-Perez – Marzioli
This session will address every aspect of orbit determination coming from the SST (Space Surveillance and Tracking), related to assessment of raw and derived data accuracy, optical measurements processing and modelling and risk analysis of space debris

A6.10 / XXX: Joint XXX / Space Debris Session
From SDC: Schildknecht – McKnight – Colombo  From XXX:

General messages on A6 Space Debris:

Joint Session A6.10?
- 2022: E10.2 NEO 7 abstracts
- 2021: B6.5 Space Operations 13 abstracts, 22 participants
- 2020: B6.5 Space Operations 11 abstracts
- 2019: B4.10 Small Satellites 14 abstracts, 59 participants
- 2018: C1.7 Astrodynamics 12 abstracts, 60 participants
- 2017: B4.10 Small Satellites 12 abstracts, 55 participants
- 2015: YPVF Young Professionals Virtual Forum 7 abstracts, 5 participants (2 presenters + 2 chairs + 1 lost in the room…)

- Globally low amount of submissions, but good interest with more than 50 participants

- Decided following a good suggestion made during the meeting:
  - Joint Session with E6 “IAF Business Innovation Symposium”; contact point Ken Davidian
  - Topic “How to make money with Space Debris?” or anything similar… “Debris and Economics??”
  - Obviously need some volunteers to take the lead on this new session

Joseph P. Loftus Jr. IAC A6 lecture
- Do we want one in Baku? Decided during the meeting: No; lets get some feedback following Paris
- What should be the selection strategy? Should we write Terms of Reference? Question is not solved – will come back later
2. Exchanges

2.1. Past events: workshops, conferences, congresses, …
2.2. On the Agenda
2.3. General information
2.4. Round table – Open discussion
2. Exchanges

2.1. Past events: workshops, conferences, congresses, ...

- Workshop on Space Policy – Mainly oriented Space Debris
  Perry World House, Penn University, Philadelphia 21 March 2022
  Good multi-cultural mixture with good lecturers (Pasco, Martinez…)
  Publication on-going
2. Exchanges

2.2. On the Agenda

- 3rd IAA Conference on Space Situational Awareness (ICSSA)
  Madrid, 4 – 6 April 2022
  Chairman Riccardo Bevilacqua

- 1st LEO Kinetic Space Safety Workshop
  Lausanne, 4 – 5 May, 2022
  Chairman Darren McKnight

- 6th Workshop on Space Debris Modeling & Remediation
  Paris, 18 – 20 May 2022
  50 presentations so far – 110 registered
  Contact me urgently if interested...

  Lille, 27 June – 1st July 2022
  500 papers so far – 25 proposals on “sustainable space”
  Chairman Luciano Anselmo
2. Exchanges

2.2. On the Agenda

- ESA DMF Workshop
  23-24 June 2022
  https://indico.esa.int/event/412
  Holger Krag – Tim Flohrer
  See Appendix 2

- 10th JAXA's Space Debris Workshop
  Chofu (Tokyo)
  Satomi Kawamoto
  See Appendix 3
2. Exchanges

2.3. General information

• Status of COSPAR-22 PEDAS.1
  Carmen Pardini
  See Appendix 4

• Report on COPUOS Activities
  Thomas Schildknecht
  See Appendix 5

• Report on Chinese Space Activities
  Zizheng Gong
  See Appendix 6
2. Exchanges

2.4. Round table – Open discussion

- Update on LEOLABS
  Darren McKnight
  See Appendix 7

- Progress and Plans for the NOAA OADR
  Mark Skinner

- New IAA Study Group Proposal: Rules of the Road in Collision Avoidance Maneuering
  David Spencer
  See Appendix 8
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### Agenda

#### 3.1 SG 5.17 IAA Situation Report on Space Debris – Update

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<tr>
<td>2. Current status (12 pages)</td>
<td>Need for someone who masters MASTER-ORDEM or equivalent, so preferably ESOC + NASA + Russia + Japan</td>
</tr>
<tr>
<td>3. Measurements (13 pages) and 4. SSA (16 pages)</td>
<td>Could be merged into a unique chapter explaining the “how it works”</td>
</tr>
<tr>
<td>Description of the SSA systems themselves placed in an Annex</td>
<td>Dan Oltrogge</td>
</tr>
<tr>
<td>5. Collision Avoidance (6 pages)</td>
<td>Easy to update, potentially to be completed with new techniques and modern examples</td>
</tr>
<tr>
<td>6. HVI and Protection (13 pages)</td>
<td>Only minor points to update</td>
</tr>
<tr>
<td>7. Reentering Space Objects (16 pages)</td>
<td>Only some statistics to update</td>
</tr>
<tr>
<td>8. Future Orbital Debris Environment (11 pages)</td>
<td>Obviously a bit more work to do</td>
</tr>
<tr>
<td>Updates of statistics</td>
<td>Ch3 and Dmck contributions &amp; Marlon E. Sorge</td>
</tr>
<tr>
<td>Inclusion of Small-sats and Constellations</td>
<td></td>
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<tr>
<td>However, most of the IADC JWG 2 derived work can be reused, unchanged</td>
<td></td>
</tr>
<tr>
<td>9. Mitigation (9 pages)</td>
<td>Mostly update, Ch3 and Dmck contributions</td>
</tr>
<tr>
<td>Well known to members of International Standards Working Groups</td>
<td>D. Finkelman</td>
</tr>
<tr>
<td>Important to update the summaries of PMD practices</td>
<td></td>
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<tr>
<td>10. Debris Remediation (12 pages)</td>
<td>Darren and Christophe + Norman</td>
</tr>
<tr>
<td>11. Legal (9 pages)</td>
<td>Update already done last year by Tanja, to be re-read</td>
</tr>
<tr>
<td>12. International (6 pages)</td>
<td>To be restructured, easy Christophe</td>
</tr>
<tr>
<td>13. Synthesis &amp; Further References (7 pages)</td>
<td>To be restructured, partially merged with §12, some can be deleted due to duplications... Christo3 &amp; D. Finkelman</td>
</tr>
<tr>
<td>Appendix (3 pages)</td>
<td>Currently</td>
</tr>
<tr>
<td>Appendix 1 List of Contributors, Authors and Reviewers</td>
<td></td>
</tr>
<tr>
<td>Appendix 2 List of Acronyms and Abbreviations</td>
<td></td>
</tr>
<tr>
<td>Dan Oltrogge</td>
<td>Proposal to have one major Appendix with all the SSA systems: we need additional contributions, and colleagues must not complain afterwards if they are not in; if they did not provide anything</td>
</tr>
</tbody>
</table>
3.1 SG 5.17 IAA Situation Report on Space Debris – Update

What next

1. We need track changes and cleaned sections from all volunteers
2. Please, use Teams to upload your documents at this [link](#)
3. We are now targeting the next IAC as deadline to have ALL sections updated, so we can compile and submit to IAA.