



International Academy of Astronautics

IAA Space Debris Committee

March 28th, 2022



Agenda

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, ...)



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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



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1. IAA Space Debris Committee

Current membership:

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

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

See appendix 1 for today's list of participants

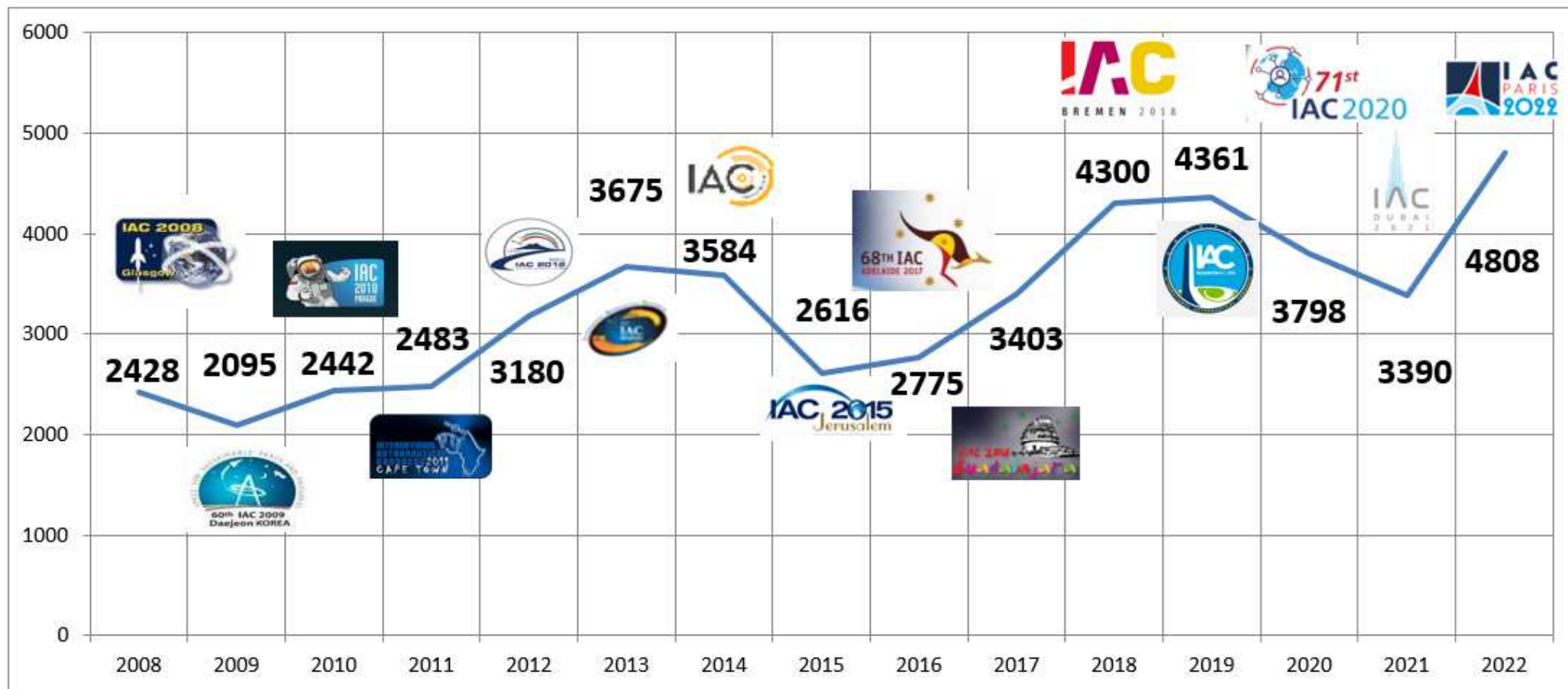
It is reminded that Program Committee (Chairs + Rapporteurs) is selected among members only



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1.2 Feedback from Dubai 2021

Number of IAC abstracts since 2008





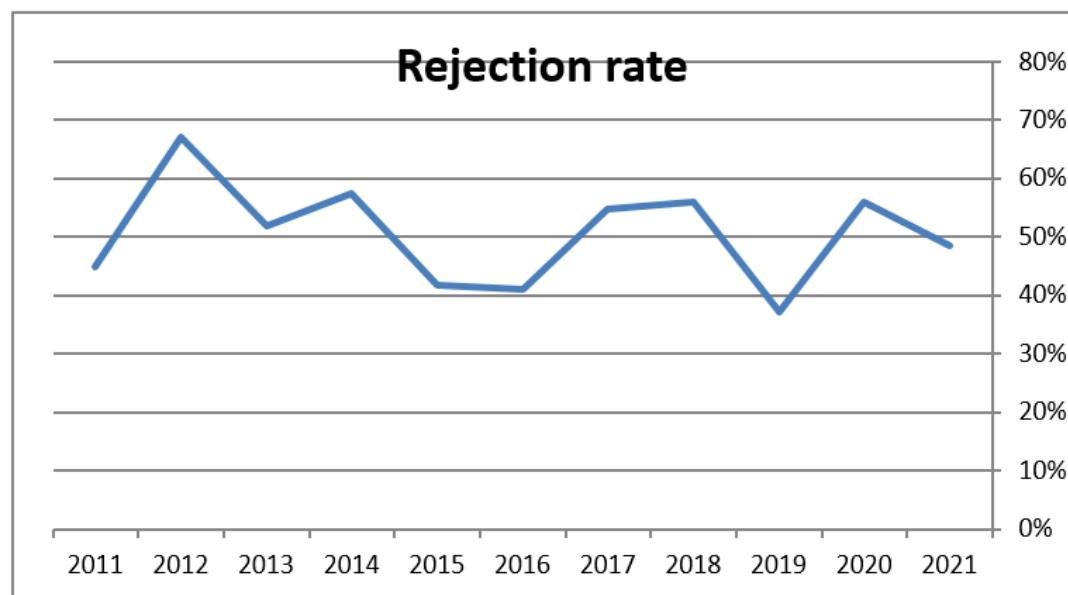
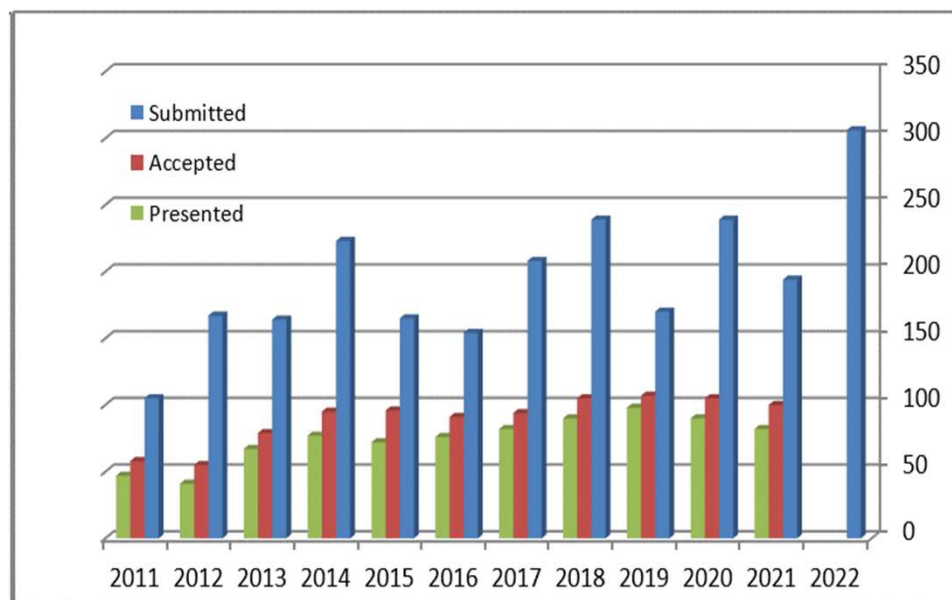
1.3 General statistics concerning A6

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 health session over the years

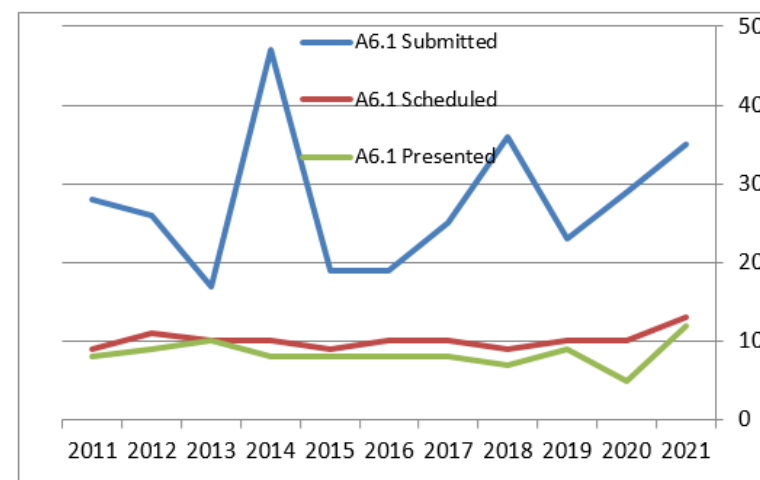
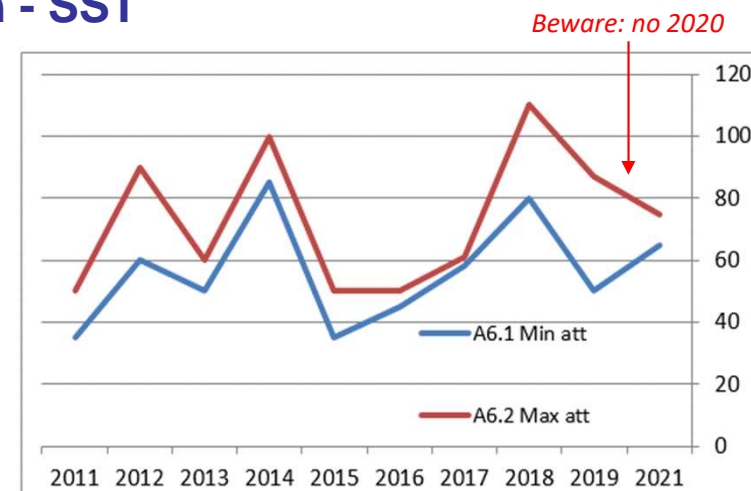
28 papers submitted in average

63% rejection rate

59.3 average average attendance

15.6% withdrawn (wo 2020). 2% no show in average

SESSION	YEAR	Min Att	Max Att	Avg Att	Papers Subm	Papers Sched	Papers Pres	Notified Withdrawn	No Show	% Selectec	% Papers Present.	% Notified Withdrawn	% No Show
Space Debris Detection, Tracking and Characterization - SST													
A6.1.	2021	65	75	70	35	13	12	3	0	37%	92%	23%	0%
A6.1.	2020	0	0	0	29	10	5	5	0	34%	50%	50%	0%
A6.1.	2019	50	87	67	23	10	9	1	0	43%	90%	10%	0%
A6.1.	2018	80	110	100	36	9	7	2	0	25%	78%	22%	0%
A6.1.	2017	58	61	60	25	10	8	2	0	40%	80%	20%	0%
A6.1.	2016	45	50	47,5	19	10	8	2	0	53%	80%	20%	0%
A6.1.	2015	35	50	42,5	19	9	8	1	0	47%	89%	11%	0%
A6.1.	2014	85	100	92,5	47	10	8	1	1	21%	80%	10%	10%
A6.1.	2013	50	60	55	17	10	10	2	0	59%	100%	20%	0%
A6.1.	2012	60	90	75	26	11	9	1	1	42%	82%	9%	9%
A6.1.	2011	35	50	42,5	28	9	8	1	0	32%	89%	11%	0%
A6.1.	Average	51,2	66,6	59,3	27,6	10,1	8,4	1,9	0,2	37%	83%	19%	2%



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)

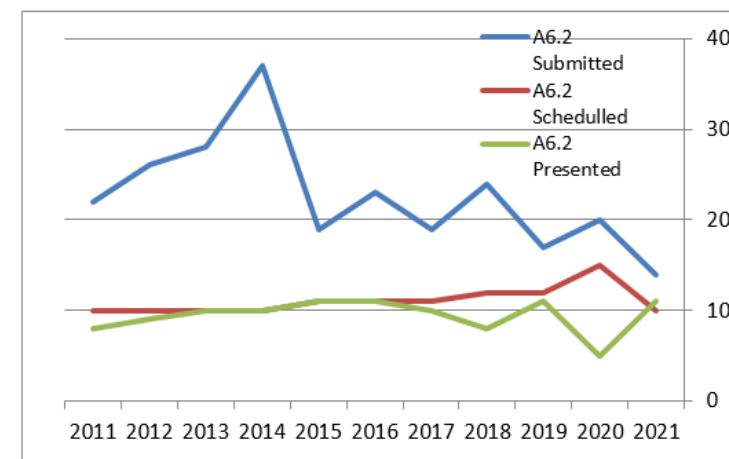
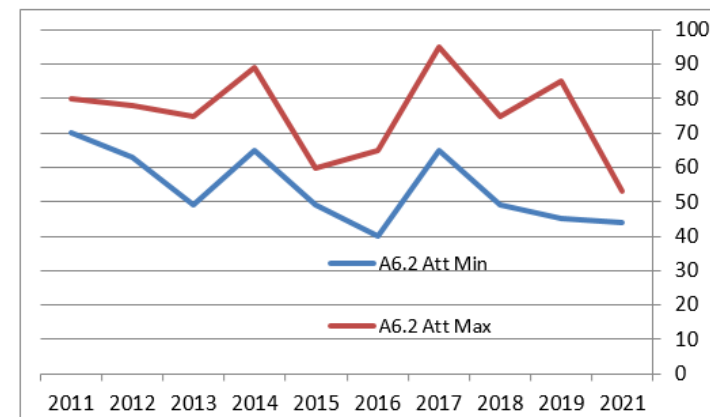
51% average rejection rate but declining (29% in 2021)

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



SESSION YEAR	Min Att	Max Att	Avg Att	Papers Subm	Papers Sched	Papers Pres	Notified Withdraw	No Show	% Papers Selecte	% Papers Present	% Notified Withdrawn	% No Show
Modeling and Risk Analysis												
A6.2. 2021	44	53	49	14	10	11	2	0	71%	110%	20%	0%
A6.2. 2020	0	0	0	20	15	5	6	4	75%	33%	40%	27%
A6.2. 2019	45	85	60	17	12	11	1	0	71%	92%	8%	0%
A6.2. 2018	49	75	62	24	12	8	3	1	50%	67%	25%	8%
A6.2. 2017	65	95	80	19	11	10	1	0	58%	91%	9%	0%
A6.2. 2016	40	65	52,5	23	11	11	0	0	48%	100%	0%	0%
A6.2. 2015	49	60	54,5	19	11	11	0	0	58%	100%	0%	0%
A6.2. 2014	65	89	77	37	10	10	0	0	27%	100%	0%	0%
A6.2. 2013	49	75	62	28	10	10	0	0	36%	100%	0%	0%
A6.2. 2012	63	78	70,5	26	10	9	0	0	38%	90%	0%	0%
A6.2. 2011	70	80	75	22	10	8	1	1	45%	80%	10%	10%
A6.2. Average	49,0	68,6	58,4	22,6	11,1	9,5	1,3	0,5	49%	85%	11%	5%

1.3 General statistics concerning A6

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

Still a problematic session...

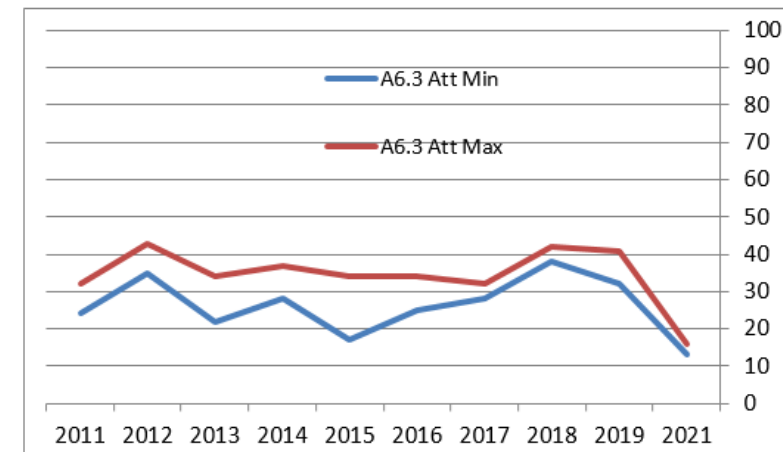
Low number of submission: 16 but only 6 in 2021, 10 in 2020, 13 in 2019...

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

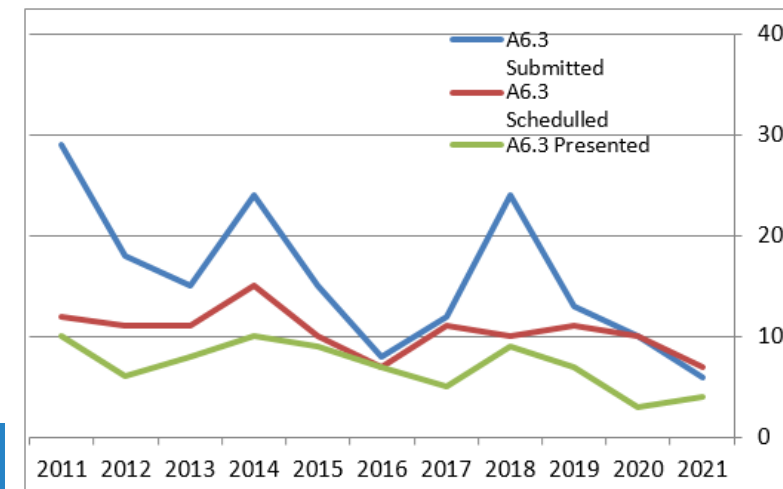
Rather good average average attendance 28 participants

19% notified withdrawn. 13% no show in average

➡ Potential action to redefine this session



SESSION YEAR	Min Att	Max Att	Avg Att	Papers Subm	Papers Sched	Papers Pres	Notified Withdraw	No Show	% Selected	% Papers Present	% Notified Withdrawn	% No Show
Impact-Induced Mission Effects and Risk Assessments												
A6.3. 2021	13	16	15	6	7	4	3	0	117%	57%	43%	0%
A6.3. 2020	0	0	0	10	10	3	2	5	100%	30%	20%	50%
A6.3. 2019	32	41	35	13	11	7	1	3	85%	64%	9%	27%
A6.3. 2018	38	42	40	24	10	9	0	1	42%	90%	0%	10%
A6.3. 2017	28	32	30	12	11	5	4	2	92%	45%	36%	18%
A6.3. 2016	25	34	29,5	8	7	7	0	0	88%	100%	0%	0%
A6.3. 2015	17	34	25,5	15	10	9	1	0	67%	90%	10%	0%
A6.3. 2014	28	37	32,5	24	15	10	5	0	63%	67%	33%	0%
A6.3. 2013	22	34	28	15	11	8	0	3	73%	73%	0%	27%
A6.3. 2012	35	43	39	18	11	6	4	1	61%	55%	36%	9%
A6.3. 2011	24	32	28	29	12	10	2	0	41%	83%	17%	0%
A6.3. Average	23,8	31,4	27,5	15,8	10,5	7,1	2,0	1,4	66%	68%	19%	13%





1.3 General statistics concerning A6

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

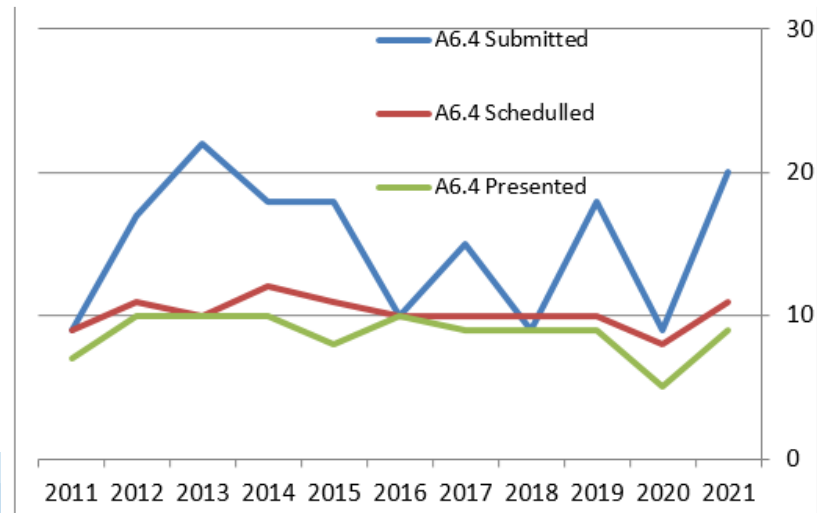
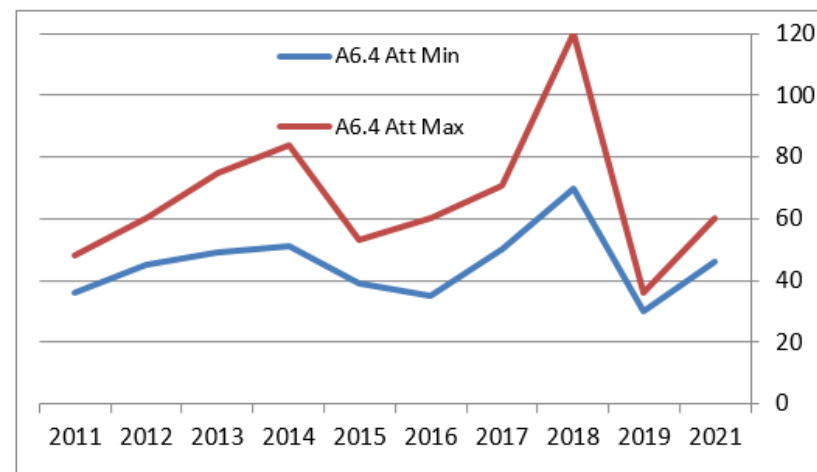
Good classical session with strong variations

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



SESSION YEAR	Min Att	Max Att	Avg Att	Papers Subm	Papers Sched	Papers Pres	Notified Withdrawn	No Show	% Papers Selected	% Papers Present	% Notified Withdrawn	% No Show
Mitigation - Tools, Techniques and Challenges - SEM												
A6.4. 2021	46	60	53	20	11	9	1	1	55%	82%	9%	9%
A6.4. 2020	0	0	0	9	8	5	3	0	89%	63%	38%	0%
A6.4. 2019	30	36	33	18	10	9	1	0	56%	90%	10%	0%
A6.4. 2018	70	120	90	9	10	9	1	0	111%	90%	10%	0%
A6.4. 2017	50	71	62	15	10	9	0	1	67%	90%	0%	10%
A6.4. 2016	35	60	47,5	10	10	10	0	0	100%	100%	0%	0%
A6.4. 2015	39	53	46	18	11	8	3	0	61%	73%	27%	0%
A6.4. 2014	51	84	67,5	18	12	10	2	0	67%	83%	17%	0%
A6.4. 2013	49	75	62	22	10	10	0	0	45%	100%	0%	0%
A6.4. 2012	45	60	52,5	17	11	10	0	1	65%	91%	0%	9%
A6.4. 2011	36	48	42	9	9	7	2	0	100%	78%	22%	0%
A6.4. Average	41,0	60,6	50,5	15,0	10,2	8,7	1,2	0,3	68%	86%	12%	3%

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)

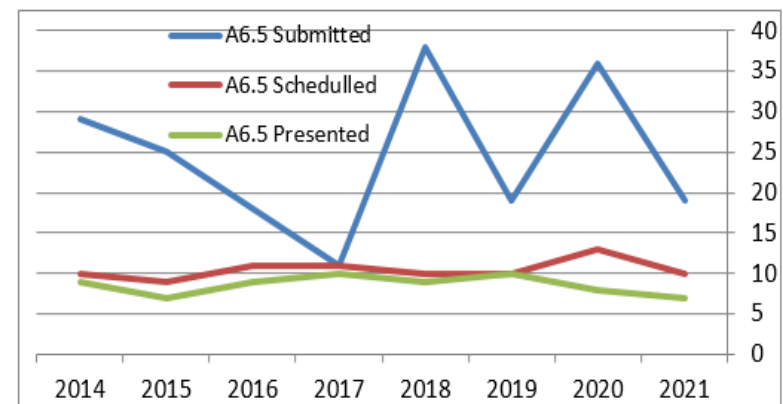
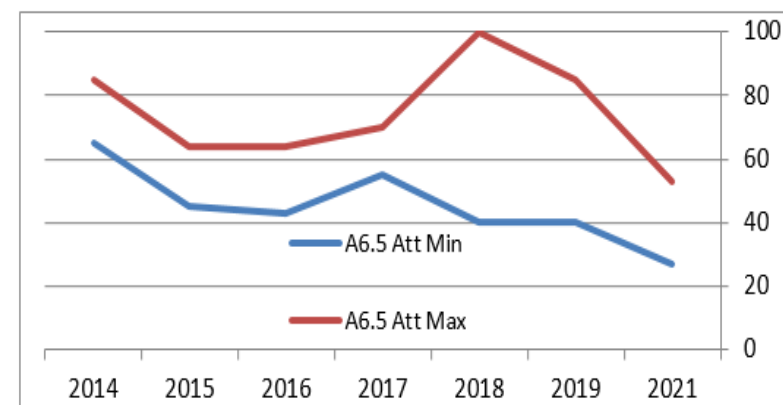
Medium number of average submission: 24 (= 52 for A6.5 + A6.6)

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)



SESSION	YEAR	Min Att	Max Att	Avg Att	Papers Subm	Papers Sched	Papers Pres	Notified Withdrawn	No Show	% Selected	% Papers Present	% Notified Withdrawn	% No Show
Post Mission Disposal and Space Debris Removal 1 - SEM													
A6.5.	2021	27	53	40	19	10	7	0	2	53%	70%	0%	20%
A6.5.	2020	0	0	0	36	13	8	3	2	36%	62%	23%	15%
A6.5.	2019	40	85	55	19	10	10	0	0	53%	100%	0%	0%
A6.5.	2018	40	100	90	38	10	9	0	1	26%	90%	0%	10%
A6.5.	2017	55	70	63	11	11	10	1	0	100%	91%	9%	0%
A6.5.	2016	43	64	53,5	18	11	9	2	0	61%	82%	18%	0%
A6.5.	2015	45	64	54,5	25	9	7	2	0	36%	78%	22%	0%
A6.5.	2014	65	85	75	29	10	9	0	1	34%	90%	0%	10%
A6.5.	Average	39,4	65,1	53,9	24,4	10,5	8,6	1,0	0,8	43%	82%	10%	7%

1.3 General statistics concerning A6

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)

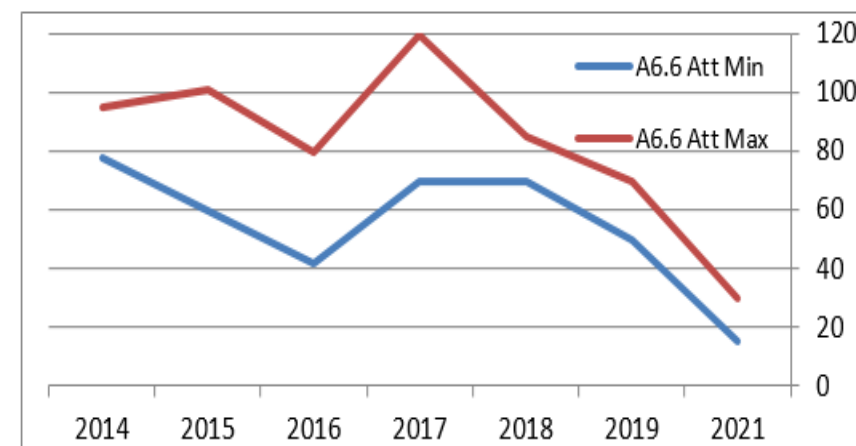
Good rejection rate 63%

Very high average average attendance 76 participants,
with very high historical max

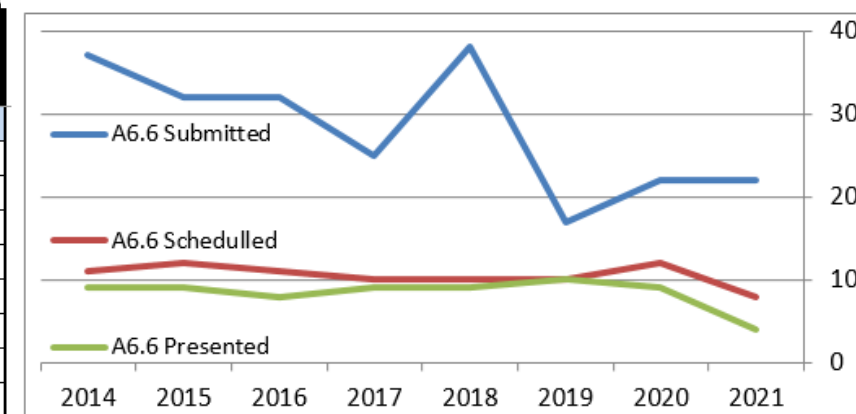
⇒ But very strong decrease in attendance in 2021

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

⇒ But very poor marks in 2021



SESSION YEAR	Min Att	Max Att	Avg Att	Papers Subm	Papers Sched	Papers Pres	Notified Withdrawn	No Show	% Selectec	% Papers Present.	% Notified Withdrawn	% No Show
Post Mission Disposal and Space Debris Removal 2 - SEM												
A6.6. 2021	15	30	23	22	8	4	3	3	36%	50%	38%	38%
A6.6. 2020	0	0	0	22	12	9	3	0	55%	75%	25%	0%
A6.6. 2019	50	70	60	17	10	10	0	0	59%	100%	0%	0%
A6.6. 2018	70	85	75	38	10	9	1	0	26%	90%	10%	0%
A6.6. 2017	70	120	95	25	10	9	1	0	40%	90%	10%	0%
A6.6. 2016	42	80	61	32	11	8	3	1	34%	73%	27%	9%
A6.6. 2015	60	101	80,5	32	12	9	2	1	38%	75%	17%	8%
A6.6. 2014	78	95	86,5	37	11	9	2	0	30%	82%	18%	0%
A6.6. Average	48,1	72,6	60,1	28,1	10,5	8,4	1,9	0,6	37%	80%	18%	6%





1.3 General statistics concerning A6

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

Good classical session since 2014

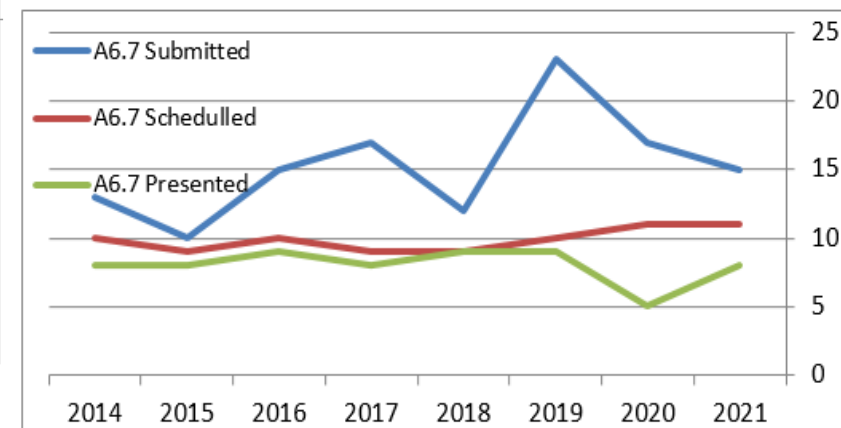
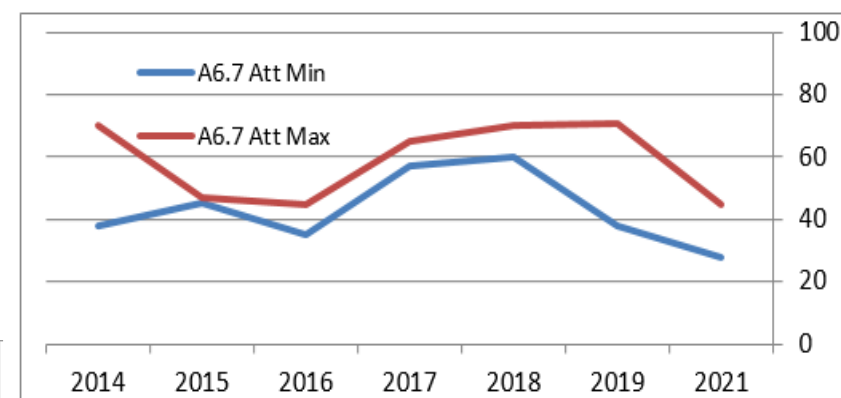
Average submission is rather low: 15

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



SESSION YEAR	Min Att	Max Att	Avg Att	Papers Subm	Papers Sched	Papers Pres	Notified Withdrawn	No Show	% Papers Selected	% Papers Present	% Notified Withdrawn	% No Show
Operations in Space Debris Environment, Situational Awareness - SSA												
A6.7 2021	28	45	37	15	11	8	2	2	73%	73%	18%	18%
A6.7 2020	0	0	0	17	11	5	4	2	65%	45%	36%	18%
A6.7 2019	38	71	40	23	10	9	1	0	43%	90%	10%	0%
A6.7 2018	60	70	65	12	9	9	0	0	75%	100%	0%	0%
A6.7 2017	57	65	61	17	9	8	1	0	53%	89%	11%	0%
A6.7 2016	35	45	40	15	10	9	0	1	67%	90%	0%	10%
A6.7 2015	45	47	46	10	9	8	1	0	90%	89%	11%	0%
A6.7 2014	38	70	54	13	10	8	1	1	77%	80%	10%	10%
A6.7. Average	37,6	51,6	42,8	15,3	9,9	8,0	1,3	0,8	65%	81%	13%	8%



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)

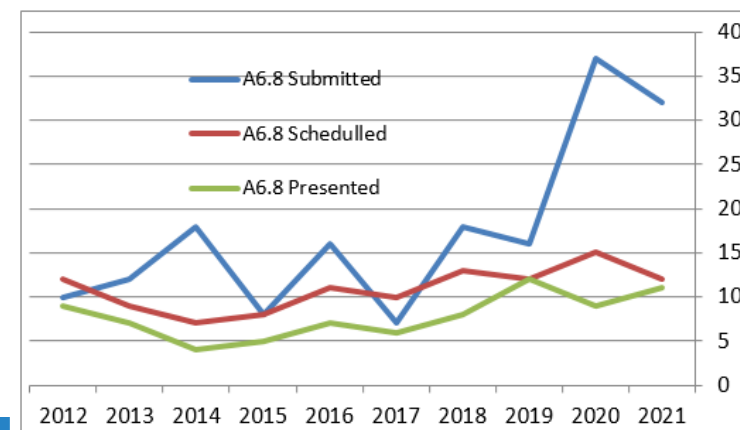
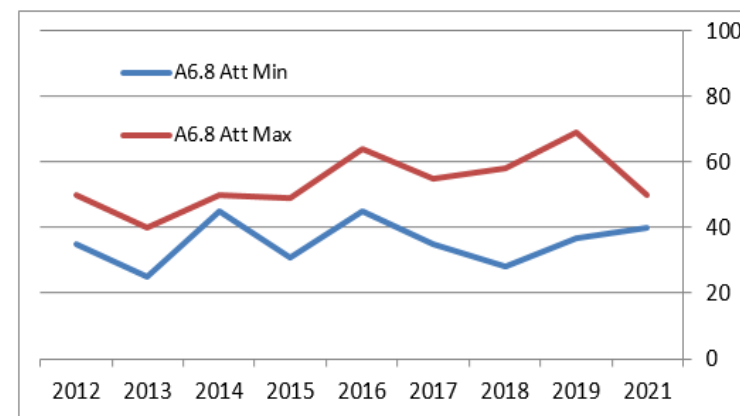
Rejection rate is correct: 37% (but 63% in 2021)

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

SESSION YEAR	Min Att	Max Att	Avg Att	Papers Subm	Papers Sched	Papers Pres	Notified Withdrawn	No Show	% Papers Selected	% Papers Present	% Notified Withdrawn	% No Show
Political, Legal, Institutional and Economic Aspects of Space Debris Mitigation and Removal - STM Security												
A6.8.	2021	40	50	45	32	12	11	1	1	38%	92%	8%
A6.8.	2020	0	0	0	37	15	9	3	3	41%	60%	20%
A6.8.	2019	37	69	44	16	12	12	0	0	75%	100%	0%
A6.8.	2018	28	58	44	18	13	8	4	1	72%	62%	31%
A6.8.	2017	35	55	45	7	10	6	3	1	143%	60%	30%
A6.8.	2016	45	64	54,5	16	11	7	3	1	69%	64%	27%
A6.8.	2015	31	49	40	8	8	5	3	0	100%	63%	38%
A6.8.	2014	45	50	47,5	18	7	4	2	1	39%	57%	29%
A6.8.	2013	25	40	32,5	12	9	7	2	0	75%	78%	22%
A6.6.	2012	35	50	42,5	10	12	9	2	1	120%	75%	17%
A6.8.	Average	32,1	48,5	39,5	17,4	10,9	7,8	2,3	0,9	63%	72%	21%



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

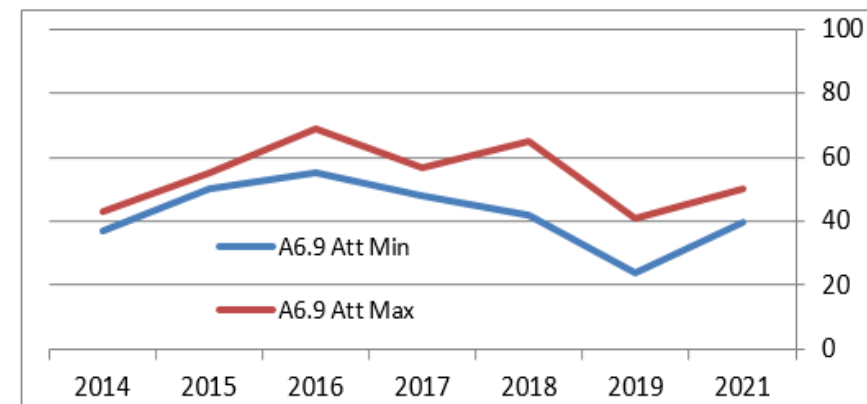
Low rejection rate: 25%

But good average average attendance: 42 participants

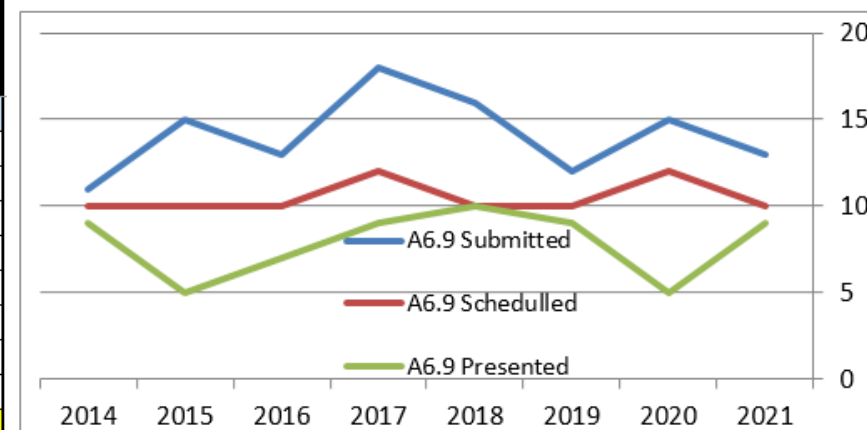
High withdrawn ratio 19% (one anomaly in 2015!).

Low number of no show: 1% (wo 2020)

↪ Potential need to redistribute with A6.1



SESSION YEAR		Min Att	Max Att	Avg Att	Papers Subm	Papers Sched	Papers Pres	Notified Withdrawn	No Show	% Papers Selected	% Papers Present	% Notified Withdrawn	% No Show
Orbit Determination and Propagation - SST													
A6.9.	2021	40	50	45	13	10	9	1	1	77%	90%	10%	10%
A6.9.	2020	0	0	0	15	12	5	4	3	80%	42%	33%	25%
A6.9.	2019	24	41	32	12	10	9	1	0	83%	90%	10%	0%
A6.9.	2018	42	65	48	16	10	10	0	0	63%	100%	0%	0%
A6.9.	2017	48	57	53	18	12	9	3	0	67%	75%	25%	0%
A6.9.	2016	55	69	62	13	10	7	3	0	77%	70%	30%	0%
A6.9.	2015	50	55	52,5	15	10	5	5	0	67%	50%	50%	0%
A6.9.	2014	37	43	40	11	10	9	1	0		90%	10%	0%
A6.9.	Average	37,0	47,5	41,6	14,1	10,5	7,9	2,3	0,5	74%	75%	21%	5%





1.3 General statistics concerning A6

Synthesis of A6:

Good symposium, steady over the years

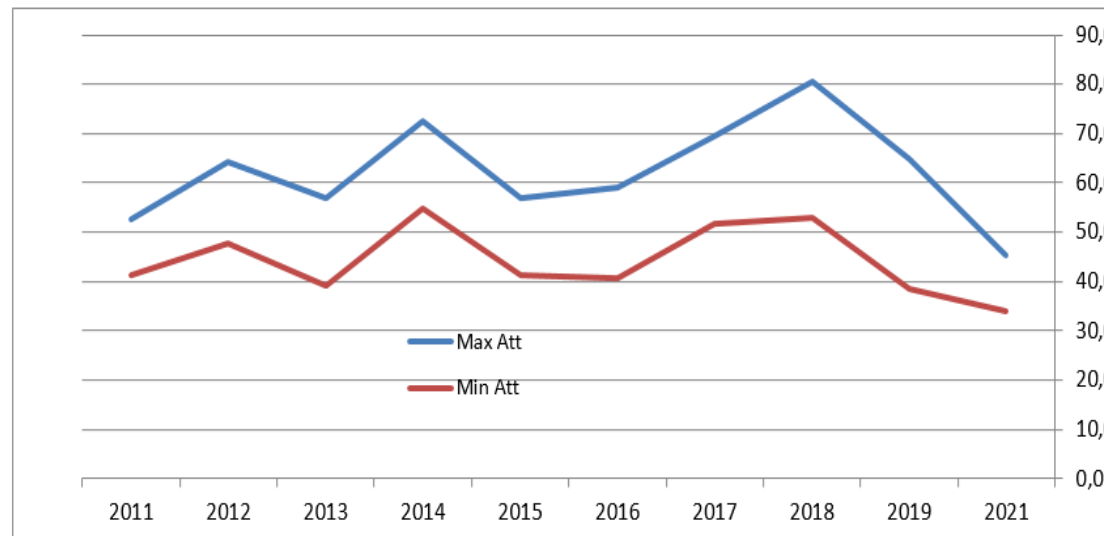
Very good participation rate, with a global average over the years of 48 per session, but decreasing

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

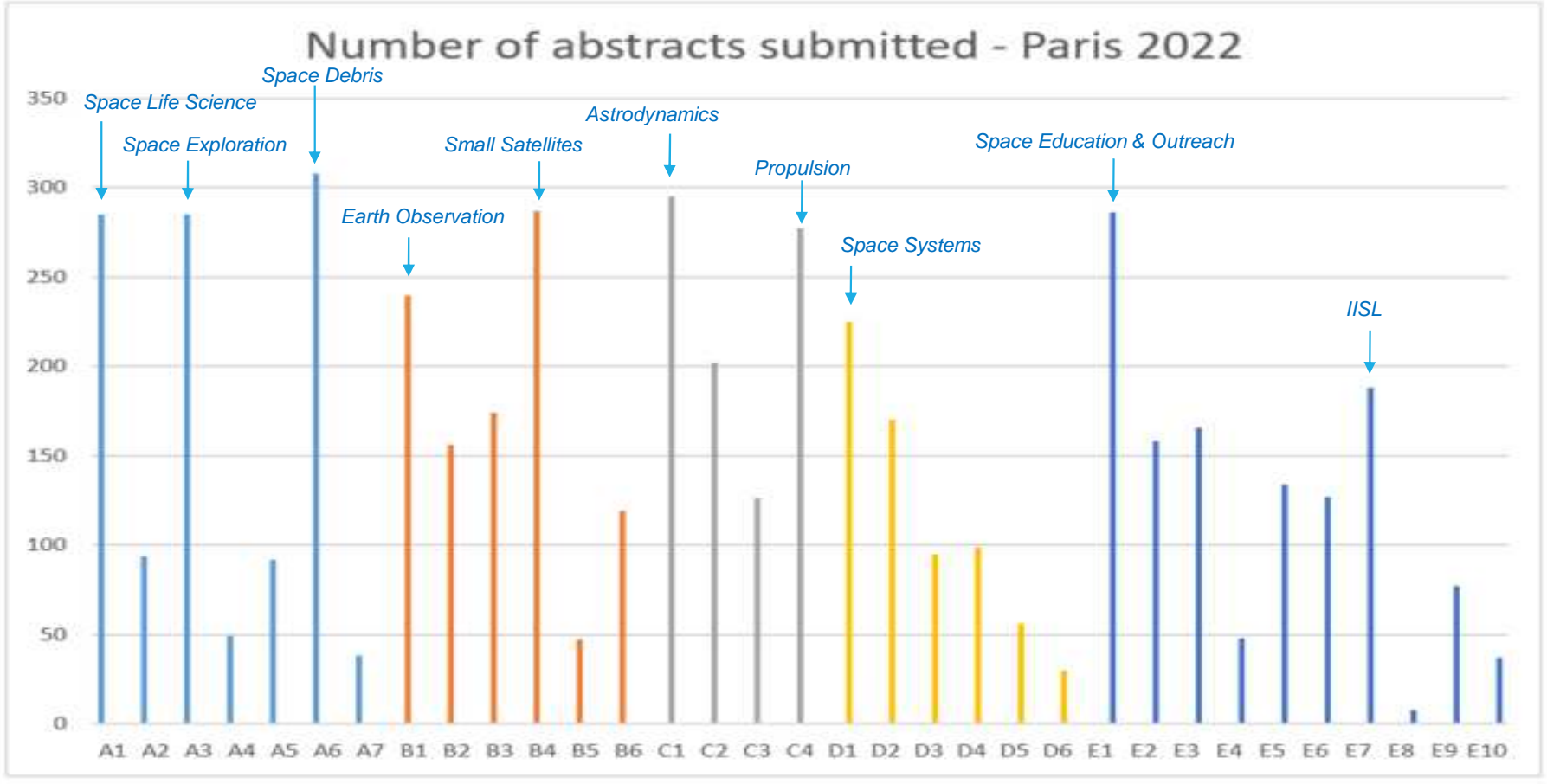
⇒ Room for improvement for some session definitions for Baku 2023





1.4. Space Debris Symposium for Paris 2022

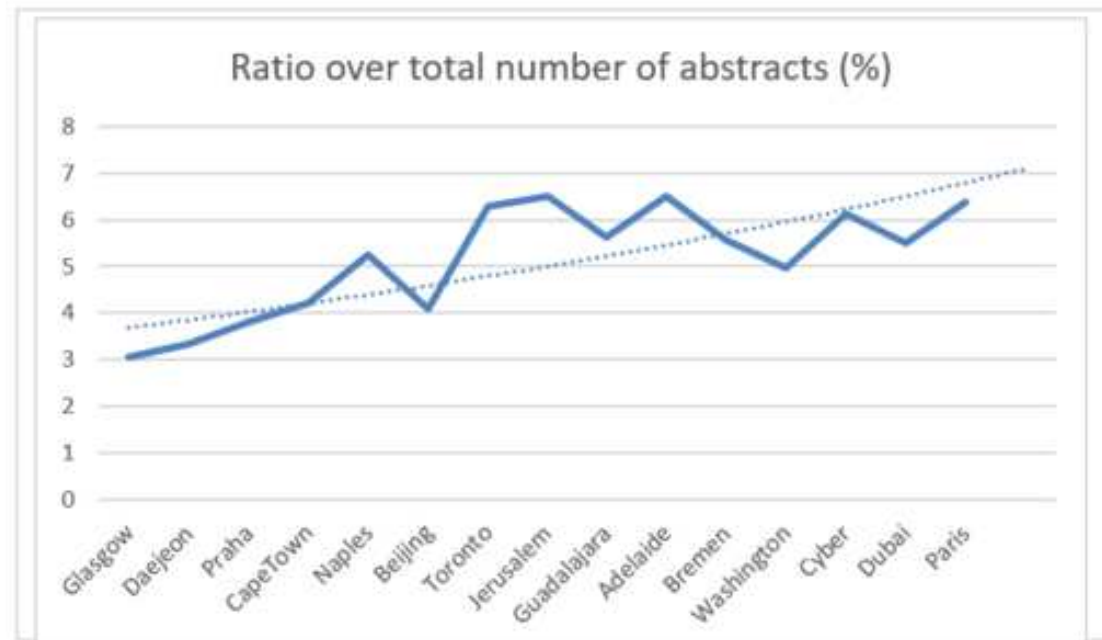
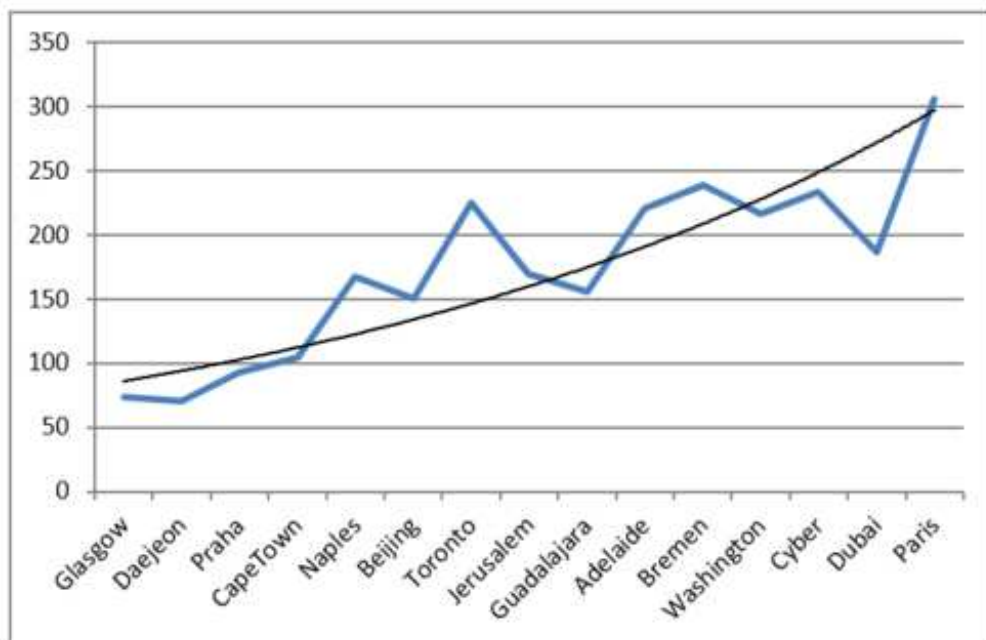
We are number 1 this year 😊... Does it mean people get more concerned about Space Debris?





1.4. General information Paris 2022

Number of abstracts, Space Debris Symposium, since 2008





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1.4. Space Debris Symposium for Paris 2022

Initial list, as per the website

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.

A6.1: Space Debris Detection, Tracking and Characterization - SST: Skinner – Agapov – Schildknecht

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: 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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1.4. Space Debris Symposium for Paris 2022

Initial list, as per the website

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.



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1.4. Space Debris Symposium for Paris 2022

Initial list, as per the website

A6.8 / E9.1 (joint with Space Security Committee): Political, Legal, Institutional and Economic Aspects of Space Debris Mitigation and Removal - STM Security

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 \cong 9 screens \Rightarrow Need for 9 to 18 volunteers!



1.4. Space Debris Symposium for Paris 2022

Updated following the abstracts selection

		Submitted	Oral	Keynote	Backup	Rejected	IP
Bevilacr@erau.edu christophe.bonnal@cnes.fr pierre.omaly@cnes.fr	A6						
	1	73	10		5	21	
mark.a.skinner@aero.org mark.skinner@alum.mit.edu vladimir.agapov@gmail.com thomas.schildknecht@aiub.unibe.ch	2	29	10		5	4	
Marlon.E.Sorge@aero.org dan@comspoc.com carmen.pardini@isti.cnr.it	3	10	8	1	4		
darren@leolabs.space gongzz@263.net jean-claude.traineau@orange.fr	4	21	10		2		
pierre.omaly@cnes.fr kawamoto.satomi@jaxa.jp Holger.Krag@esa.int	5	39	10		5	21	
balbir.s@manipal.edu roberto.opromolla@unina.it laurent.francillout@cnes.fr	6	25	10		5	8	
marko.jankovic@dfki.de dim.gr@mail.ru j.auburn@astroscale.com	7	37	10		4	14	
vincent.martinot@thalesaleniaspace.cc ts.kelso@celestrak.com noelia.sanchez.ortiz@gmail.com							



1.4. Space Debris Symposium for Paris 2022

Updated following the abstracts selection

db9@psu.edu	8	51	11	1	5	22	
s.plattard@ucl.ac.uk							
t.l.masson@law.leidenuniv.nl							
alexander.soucek@esa.int							
emelkerr@gmail.com							
jan.siminski@esa.int	9	14	10		4	2	
Juan-Carlos.DoladoPerez@cnes.fr							
paolo.marzioli@uniroma1.it							
thomas.schildknecht@aiub.unibe.ch	10	7	6	1			
darren@leolabs.space							
daniel.d.mazanek@nasa.gov							
Alissa_haddaji@alumni.brown.edu							
philipp.maier@community.isunet.edu							
camilla.colombo@polimi.it							
francesca.letizia@esa.int	IP	6				83	
paolo.marzioli@uniroma1.it							
roberto.opromolla@unina.it							
marko.jankovic@dfki.de							
emelkerr@gmail.com							
christophe.bonnaud@cnes.fr							
Total Oral		306	95	3	39	92	229
Total with IP		312				83	



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



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1.4. Space Debris Symposium for Paris 2022

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: lets 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

Selected Technical Session	Abstract ID	Abstract Title	Author Last Name	Accepted Session	Paper Order	O=Oral I=Interactive R=Rejected T=Transferred B=Back-up	Oral Presentation length	Comments/Reasons for rejection
A6.9.	69035	Lunar observer efficacy for NRHO target tracking	Fedeler					
A6.9.	69305	SSA observation campaign of the ELSA-d mission	Harris					
A6.9.	69365	Applying Graph-based Clustering to Tracklet-Tracklet Correlation	Schmitz					
A6.9.	69481	Polynomial Algebra for Uncertainty Propagation in Equinoctial Orbital Elements	Hallgarten La Casta					
A6.9.	69683	A cython bound tracklet-tracklet correlation for resident space objects	Rack					

SELECTION OF PAPER 63400

"ORBITAL FLIPS DUE TO SOLAR RADIATION PRESSURE FOR ORBITAL DEBRIS IN MEO AND GSO"

Main author

Kuznetsov, Eduard

Country

Russian Federation

Selected technical symposium/session

A6/IP

Transfer paper

(a paper should be located in the most appropriate session)

Review status

☐ accepted ☐ rejected ☒ work

Paper order

Length of oral presentation

(default 10 minutes if empty)

Comments or Reasons for rejection

(not required)

[Back](#)

[Reset](#)

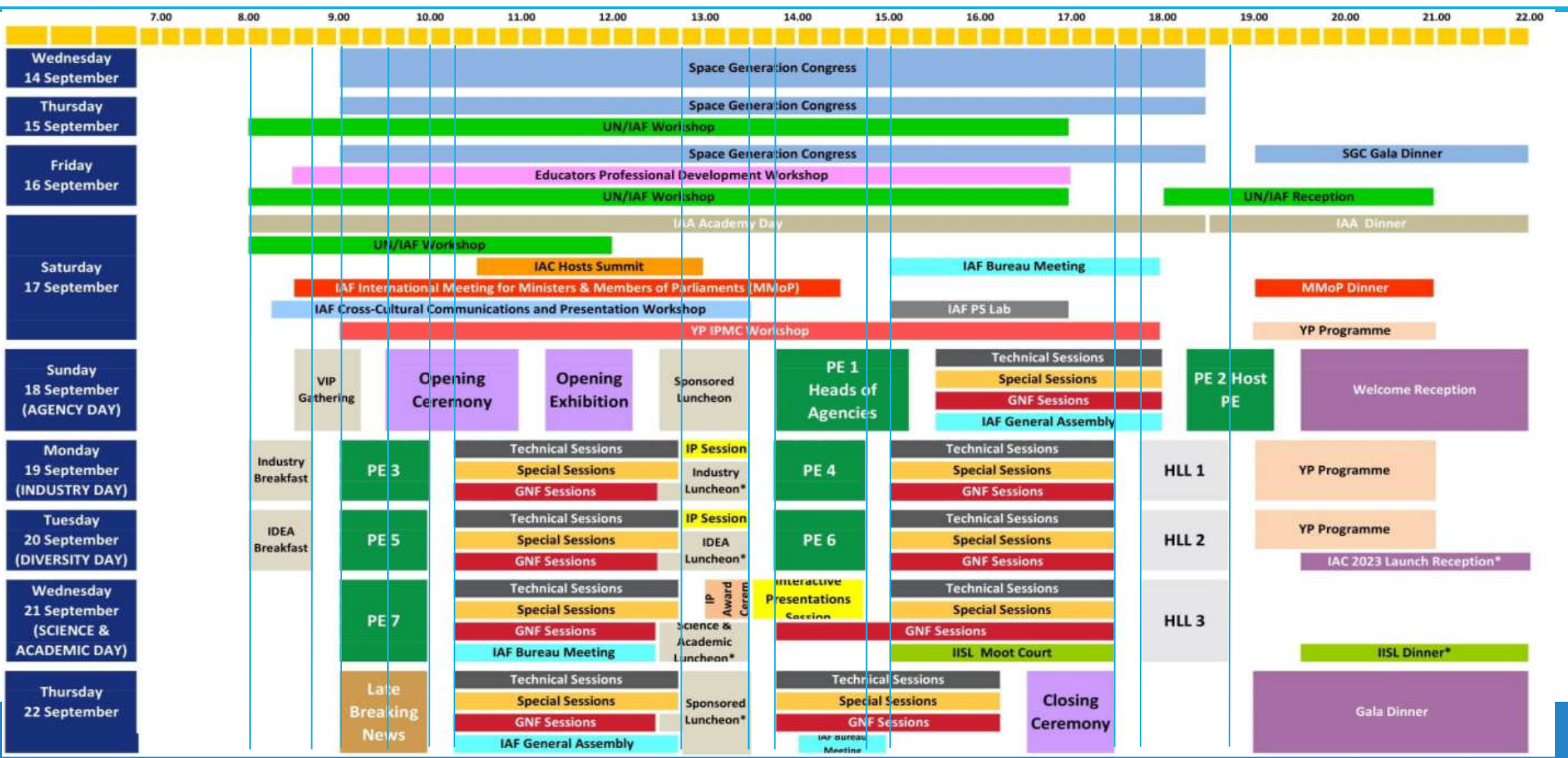
Make Selection

The operation can not be undone, although the selection result can be changed again.



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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 \Rightarrow 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
- \Rightarrow 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 \Rightarrow 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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1.5. Space Debris Symposium for Baku 2023

IAC	Year	Location	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	Session 8	Session 9	Session 10	Interactive Presentations
67th	2016	Guadalajara	D. Oltrogge [C] T. Schildknecht [C] V. Agapov [R]	C. Pardini [C] M. Sorge [C] B. Bastida-Virgili [R]	N. Fitz Coy [C] F. Schaefer [C] A. Francesconi [R]	H. Krag [C] C. Cazaux [C]	S. Kibe [C] F. Piergentili [C] F. Santoni [R]	N. Berend [C] L. Innocenti [C] G. Haussmann [R]	T.S. Kelso [C] J-C. Dolado-Perez [C] C. Wiedemann [R]	S. Plattard [C] D. Finkleman [R]	M. Jah [C] H. Klinkrad [C]		T. Yasaka D. McKnight C. Bonnal
68th	2017	Adelaide	F. DiPentino [C] T. Schildknecht [C] V. Agapov [R]	C. Pardini [C] D. Oltrogge [C] M. Sorge [R]	F. Schaefer [C] N. Fitz Coy [C] A. Francesconi [R]	C. Cazaux [C] D. Finkleman [C] H. Krag [R]	B. Bastida-Virgili [C] F. Santoni [C] F. Piergentili [R]	N. Berend [C] L. Innocenti [C] B. Singh [R]	T.S. Kelso [C] J-C. Dolado-Perez [C] C. Wiedemann [R]	D. McKnight [C] S. Plattard [C] A. Soucek [R]	H. Klinkrad [C] M. Jah [C] H. Lewis [R]	D. Oltrogge [C] L. Rossettini [C] C. Cazaux [R]	T. Yasaka D. McKnight C. Bonnal
69th	2018	Bremen	F. DiPentino [C] T. Schildknecht [C] V. Agapov [R]	L. Anselmo [C] D. Oltrogge [C] M. Sorge [R]	N. Fitz Coy [C] F. Schaefer [C] D. McKnight [R]	H. Krag [C] P. Omalý [C] Y. Usovik [R]	F. Piergentili [C] B. Bastida-Virgili [C] F. Santoni [R]	N. Berend [C] B. Singh [C] L. Rossettini [R]	C. Wiedemann [C] T.S. Kelso [C] J-C. Dolado-Perez [R]	D. Spencer [C] S. Lemay [R]	S. Kibe [C] H. Lewis [C] H. Klinkrad [R]	M. Jah [C] Anilkumar [C] Kitazawa [R]	T. Yasaka D. McKnight C. Bonnal
70th	2019	Washington	M. Skinner [C] T. Schildknecht [C] V. Agapov [R]	M. Sorge [C] C. Pardini [C] D. Oltrogge [R]	JC Traineau [C] M. Jah [C] N. Fitz Coy [R]	H. Krag [C] S. Kawamoto [C] P. Omalý [R]	F. Santoni [C] A. Nassisi [C] L. Francilout [R]	L. Rossettini [C] E. Kerr [C] N. Berend [R]	C. Wiedemann [C] N. Sanchez-Ortiz [C] T.S. Kelso [R]	D. Spencer [C] S. Lemay [R]	H. Klinkrad [C] J-C. Dolado-Perez [R] F. Piergentili [R]	U. Dasgupta [C] Y. Usovik [C]	T. Yasaka D. McKnight C. Bonnal
71st	2020	Cyber	T. Schildknecht [C] M. Skinner [C] V. Agapov [R]	C. Pardini [C] D. Oltrogge [C] M. Sorge [R]	Z. Gong [C] E. Kerre [C] JC Traineau [R]	S. Kawamoto [C] P. Omalý [C] H. Krag [R]	B. Singh [C] L. Francilout [C] R. Opromolla [R]	J. Auburn [C] N. Berend [C] C. Wiedemann [R]	T.S. Kelso [C] N. Sanchez-Ortiz [C] V. Martinot [R]	S. Plattard [C] S. Lemay [C] A. Soucek [R] D. Spencer [R]	H. Klinkrad [C] J-C. Dolado-Perez [R] F. Santoni [R]	D. McKnight [C] H. Tung [C] A. Anilkumar [R]	T. Yasaka D. McKnight M. Jankovic
72nd	2021	Dubai	M. Skinner [C] M. Jah [C] T. Schildknecht [R]	M. Sorge [C] D. Oltrogge [C] C. Pardini [R]	D. McKnight [C] Z. Gong [C] JC Traineau [R]	P. Omalý [C] S. Kawamoto [C] H. Krag [R]	B. Singh [C] R. Opromolla [C] L. Francilout [R]	M. Jankovic [C] C. Wiedemann [C] J. Auburn [R]	V. Martinot [C] T.S. Kelso [C] N. Sanchez-Ortiz [R]	D. Spencer [C] T. Masson-Zwaan [C] S. Lemay [R]	H. Klinkrad [C] F. Santoni [C] J-C. Dolado-Perez [R]	V. Agapov [C] H. Tung [C] A. Anilkumar [R]	E. Kerr S. Lemay F. Santoni R. Opromolla M. Jankovic
73rd	2022	Paris	M. Skinner [C] V. Agapov [C] T. Schildknecht [R]	M. Sorge [C] D. Oltrogge [C] C. Pardini [R]	D. McKnight [C] Z. Gong [C] JC Traineau [R]	P. Omalý [C] S. Kawamoto [C] H. Krag [R]	B. Singh [C] R. Opromolla [C] L. Francilout [R]	M. Jankovic [C] D. Grishko [C] J. Auburn [R]	V. Martinot [C] T.S. Kelso [C] N. Sanchez-Ortiz [R]	D. Spencer [C] T. Masson-Zwaan [C] E. Kerr [R]	J. Siminski [C] J-C. Dolado-Perez [R] P. Marzioli [R]	T. Schildknecht [C] D. McKnight [C] C. Colombo [R]	E. Kerr F. Letizia F. Santoni R. Opromolla M. Jankovic P. Marzioli



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1.5. Space Debris Symposium for Baku 2023

Evolutions of the text – Evolutions of the Chairs & Rapporteurs

A6: Space Debris Symposium: Bonnal – Bevilacqua – Omaly

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.

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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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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.

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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.



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1.5. Space Debris Symposium for Baku 2023

A6.8 / E9.1 (joint with Space Security Committee): Political, Legal, Institutional and Economic Aspects of Space Debris Mitigation and Removal - STM Security

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:

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



1.5. Space Debris Symposium for Baku 2023

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. 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. 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. Exchanges

2.2. On the Agenda

- 3rd IAA Conference on Space Situational Awareness (ICSSA)
Madrid, 4 – 6 April 2022
<https://iaaspace.org/event/3rd-iaa-conference-on-space-situational-awareness-icssa-2022/>
Chairman Riccardo Bevilacqua
- 1st LEO Kinetic Space Safety Workshop
Lausanne, 4 – 5 May, 2022
<https://swfound.org/media/207332/2022-leo-kinetic-space-safety-workshop-flyer.pdf>
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...
- 9th EUCASS-3AF Conference <https://eucass-3af-2022.eu/>
Lille, 27 June – 1st July 2022
500 papers so far – 25 proposals on “sustainable space”
Chairman Luciano Anselmo



2. Exchanges

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. 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. 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 Maneuring
David Spencer
See Appendix 8



Agenda

3.1 SG 5.17 IAA Situation Report on Space Debris – Update

Initial volunteers and currently available sections

Responded?	Contributor	Email	Contribution offered	Existing draft
Yes	Manuel Metz	Manuel.Metz@dlr.de	summary on European Countries and especially the EUSST Consortium for the Appendix of the Report	Not yet
Yes	Balbir Singh Dr. A K Anilkumar	balbirs@manipal.edu ak_anilkumar@isro.gov.in	ISRO India	isro_IAA_note.pdf
Yes	Tanya Masson Olga Volynskaya	aoerjia88@mail.ru t.l.masson@law.leidenuniv.nl	legal	11. Legal_updated_clean_23 Mar 2022 (CLEAN)
Yes	Roberto Opromolla Marko Jankovic	roberto.opromolla@unina.it marko.jankovic@dfki.de	debris remediation	IAA Space Debris Situation Report 2019 - SG 5_17- Debris Remediation Chapter - ThirdDraft_RO_MJ_03122021
Yes	Christophe Darren	darren@leolabs.space christophe.bonnal@cnes.fr	several sections	Not yet
To be contacted	Nicolas Berend		Remediation (overlap with Opromolla and Jankovic)	Not yet
yes	Juan Carlos Dolado Perez	Juan-Carlos.DoladoPerez@cnes.fr	Future Population	8. Future environment_last_report_working_doc_v4
yes	Frank Schafer	Frank.Schaefer@emi.fraunhofer.de	HVI	Not yet



Agenda

3.1 SG 5.17 IAA Situation Report on Space Debris – Update

Distribution of tasks and sections that came later on

0.	Executive Summary & Table of Contents ⇒ Darren and Christophe		
1.	Introduction ⇒ Darren and Christophe		
2.	Current status (12 pages) ⇒ Need for someone who masters MASTER-ORDEM or equivalent, so preferably ESOC + NASA + Russia ? Japan ?		
3.	Measurements (13 pages) and 4. SSA (16 pages) Could be merged into a unique chapter explaining the “how it works” Description of the SSA systems themselves placed in an Annex	Noelia Sanchez Ortiz	Thomas Schildknecht
	Strong wish to have extra systems, mainly ESA, EUSST, China, Australia, ... Personal opinion: no significant effort to update, fundamentally structure of the chapter		
5.	Collision Avoidance (6 pages) ⇒ Easy to update, potentially to be completed with new techniques and modern examples		D. Finkleman & Dan Oltrogge
6.	HVI and Protection (13 pages) ⇒ Only minor points to update		
7.	Reentering Space Objects (16 pages) ⇒ Only some statistics to update	Dr. A K Anilkumar & Marlon E Sorge	
8.	Future Orbital Debris Environment (11 pages) δ Obviously a bit more work to do J Updates of statistics Inclusion of Small-sats and Constellations However, most of the IADC WG2 derived work can be reused, unchanged	ChB and DmcK contributions & Marlon E Sorge	
9.	Mitigation (9 pages) ⇒ Mostly update, ChB and DmcK contributions Well known to members of International Standards Working Groups Important to update the summaries of PMD practices	D. Finkleman	
10.	Debris Remediation (12 pages) δ Darren and Christophe + Norman!		
11.	Legal (9 pages) ⇒ Update already done last year by Tanja; to be re-read		
12.	International (6 pages) ⇒ To be restructured, easy. Christophe		
13.	Synthesis & Further References (7 pages) ⇒ To be restructured, partially merged with §12, some can be deleted due to duplications... Christoph		D. Finkleman
	Appendix (3 pages) ⇒ Currently Appendix 1 List of Contributors, Authors and Reviewers Appendix 2 List of Acronyms and Abbreviations		
	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		



**International
Academy of
Astronautics**

Agenda

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.