International Academy of Astronautics

IAA Space Debris Committee

Adelaide, September 23rd, 2017

International Academy of Astronautics

Agenda

1. IAC
   - 1.1. IAA Space Debris Committee
   - 1.2. Lessons learned from Guadalajara 2016
   - 1.3. Status of Space Debris Symposium for Adelaide 2017
   - 1.4. Preparation of Space Debris Symposium for Bremen 2018

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

3. IAA Study Groups
   - 3.1 SG 5.14 IAA Situation Report on Space Debris – 2016
   - 3.2 SG 5.10 Orbital Debris Removal: Policy, Legal, Political and Economic Considerations
   - 3.3 SG 4.23 Practical Solutions for Post Mission Deorbit for Micro/Nano/Pico Satellites in Low Earth Orbit
   - 3.4 SG 5.17 IAA Situation Report on Space Debris – 2019

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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**

- **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**
  - **Situation Report Paper 2016 SG 5.14 finished and distributed**
  - **Situation Report Paper 2019 SG 5.17 on going**
  - **Participation to the new SG 4.23**

1.1. IAA Space Debris Committee

Terms of Reference (recall):

Scope

Coordination of all activities related to Space Debris within the Academy

•Organization of the IAA Symposium on Space Debris A6 for the IAC, proposals for Keynote Lectures within the A6 Symposium, or Highlight Lectures in the more general IAC frame,

•Organization of any stand-alone conference on Space Debris on behalf the Academy,

•Coordination of the Academy sponsoring, participation and contribution to selected conferences dedicated to Space Debris, such as for instance the ESA Darmstadt Conference,

•Coordination of the Space Debris contribution in conferences not dedicated to Space Debris, but where some sessions may be devoted to the topic, sponsored by the Academy,

•Dissemination of information among the members of the Committee, mainly during regular meetings taking place twice a year, before the IAC and during the IAA March meetings in Paris.

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1.1. IAA Space Debris Committee

Membership:

No need to be member of IAA !

- **Members of the IAA A6 Symposium Program Committee (chairs & rapporteurs)**
- **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 somehow "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**

http://iaaweb.org/content/view/487/655/

Two meetings per year:

- **One just before each year's IAC**
  - ↳ **Includes the status of the sessions, workshops, round tables… of the week**
- **One just before or during the IAC March Meeting in Paris**
  - ↳ **Includes the pre-selection of the abstracts for the following IAC**

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1.1. IAA Space Debris Committee

Official membership (as per web site):

Co-Chair: Bonnal Christophe
Co-Chair: Klinkrad Heiner
Co-Chair: Liou Jer-Chyi

Members:
Agapov Vladimir
Ailor William H
Alby Fernand
Anselmo Luciano
Berend Nicolas
Brachet Gerard
Cazaux Christian
DiPentino Frank
Dolado-Perez Juan-Carlos
Faucher Pascal
Finkleman David
Fitz-Coy Norman
Flohrer Tim
Flury Walter
Francesconi Alessandro
Fuentes Nathalie
Hanada Toshiya
Hyde James
Jah Moriba K.
Kelso T. S
Kibe Seishiro
Krag Holger
Krisko Paula H
Lewis Hugh
Mathieu Charlotte
McKnight Darren S
Metz Manuel
Oltrogge Daniel L.
Omaly Pierre
Pardini Carmen
Santoni Fabio
Schaefer Frank
Schildknecht Thomas
Sorge Marlon
Spencer David
Stokes Hedley
Wiedemann Carsten
Yasaka Tetsuo

To be formally invited:

Akahoshi Yasuhiro
Anz-Meador Phillip
Christiansen Eric L
Crowther Richard
Gong Zizheng
Kaliapin Mykhailo
Lin Shen
Masson-Zwaan Tanja
Matney Mark
Piergentili Fabrizio
Rossettini Luca
Singh Balbir
Usovik Igor
KitazawaYukihito
Anilkumar A.K.
Kim Hae-Dong
Le May Samantha

To be removed

Fuentes Nathalie
Mathieu Charlotte

41 + 17 – 2 = 56 members

Attendance list for today: 36 participants - see **Appendix 1**.

Note:

New members from China, India, Ukraine, Russia, S-Korea, Australia: Welcome!

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1.2. Feedback from Guadalajara 2016

STATISTICS	IAC 2016 - Guadalajara	
Abstracts submitted	2775	
Abstracts rejected	554	20% of submitted
Papers accepted	2199	80% of submitted
Including accepted Interactive Presentations	409	
Papers confirmed	1523	69% of accepted
Papers withdrawn	501	
Papers with manuscript	1431	94% of confirmed 65% of accepted
Papers presented	1166	76% of confirmed 53% of accepted 42% of submitted
Including presented as Interactive Presentations	205	
Total number of attendees	5260	

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1.2. Feedback from Guadalajara 2016

Sessions	2012	2013	2014	2015	2016
	Naples	Beijing	Toronto	Jerusalem	Guadalajara
Number of abstracts submitted	3212	3657	3584	2669	2775
Number of papers selected	2184	2320	2392	2130	2199
Number of papers confirmed	1600	1640	1558	1448	1523
Number of papers presented	1374	1304	1256	1149	1167
Ratio Paper Not Presented/ papers selected	37%	43%	47%	46%	47%

- **Half of the papers selected are not presented**
- **Total number of papers presented decreases despite the strong increase in participation**
- **Special attention to this phenomenon within IPC Steering Group**
- **General question relative to attractiveness of the Technical Program**

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1.2. Feedback from Guadalajara 2016

#1 Symposium attendance Avg

TECHNICAL SESSIONS	Min Att	Max Att	Avg Att	Papers Sched	Papers Pres	Notified Withdrawr	No Show	% Papers Present.	% Notified Withdrawn	% No Show
A1. IAA/IAF SPACE LIFE SCIENCES	272	406	339	66	44	14	8	68%	21%	11%
A2. MICROGRAVITY SCIENCES AND PROCESSES	145	225	185	46	27	15	4	60%	32%	8%
A3. SPACE EXPLORATION SYMPOSIUM	283	585	434	69	49	13	6	72%	18%	9%
A4. 45th SYMPOSIUM ON THE SEARCH FOR EXTRATERRESTRIAL INT	130	165	148	20	17	2	1	85%	10%	5%
A5. 19th IAA SYMPOSIUM ON HUMAN EXPLORATION OF THE SOLAR S	159	263	211	44	28	7	8	62%	16%	19%
A6. SPACE DEBRIS	365	531	448	91	76	13	3	79%	21%	2%
A7. SYMPOSIUM ON TECHNOLOGICAL REQUIREMENTS FOR FUTURE	52	94	73	20	14	4	2	72%	20%	8%
B1. EARTH OBSERVATION SYMPOSIUM	149	227	188	60	39	12	9	64%	20%	16%
B2. SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM	114	197	156	84	48	22	13	57%	27%	17%
B3. HUMAN SPACEFLIGHT SYMPOSIUM	329	489	409	78	58	12	8	75%	15%	10%
B4. 23rd SYMPOSIUM ON SMALL SATELLITE MISSIONS	289	470	380	115	92	20	3	80%	17%	3%
B5. SYMPOSIUM ON INTEGRATED APPLICATIONS	25	30	28	21	9	8	4	42%	39%	20%
B6. SPACE OPERATIONS SYMPOSIUM	78	150	114	42	28	10	4	69%	21%	10%
C1. ASTRODYNAMICS	251	491	371	109	83	25	1	76%	23%	1%
C2. MATERIALS AND STRUCTURES SYMPOSIUM	231	340	286	106	59	23	24	55%	22%	23%
C3. SPACE POWER SYMPOSIUM	95	156	126	35	23	9	3	66%	26%	9%
C4. SPACE PROPULSION SYMPOSIUM	237	490	364	114	76	27	11	67%	24%	10%
D1. SPACE SYSTEMS	124	214	169	73	55	12	6	77%	16%	7%
D2. SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMP	279	533	406	99	82	10	7	84%	10%	6%
D3. 14th IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE	32	66	49	19	12	5	2	63%	27%	11%
D4. 14th IAA SYMPOSIUM ON VISIONS AND STRATEGIES FOR THE FA	117	170	144	46	37	8	1	80%	18%	2%
D5. 49th SYMPOSIUM ON SAFETY AND QUALITY IN SPACE ACTIVITIES	72	98	85	26	17	4	5	69%	13%	17%
D6. SYMPOSIUM ON COMMERCIAL SPACEFLIGHT SAFETY ISSUES	66	102	84	23	21	2	0	92%	8%	0%
E1. SPACE EDUCATION AND OUTREACH SYMPOSIUM	192	351	272	103	72	25	6	69%	26%	5%
E2. 46th STUDENT CONFERENCE	97	162	130	40	26	10	4	62%	26%	12%
E3. 29th IAA SYMPOSIUM ON SPACE POLICY, REGULATIONS AND EC	125	193	159	72	46	25	1	68%	31%	1%
E4. 50th IAA HISTORY OF ASTRONAUTICS SYMPOSIUM	80	105	93	22	19	1	2	84%	3%	13%
E5. 27th IAA SYMPOSIUM ON SPACE AND SOCIETY	65	116	91	61	37	11	3	70%	16%	6%
E6. BUSINESS INNOVATION SYMPOSIUM	21	42	32	21	19	2	0	91%	9%	0%
E7. 59th IISL COLLOQUIUM ON THE LAW OF OUTER SPACE	255	357	306	74	57	12	5	79%	15%	6%

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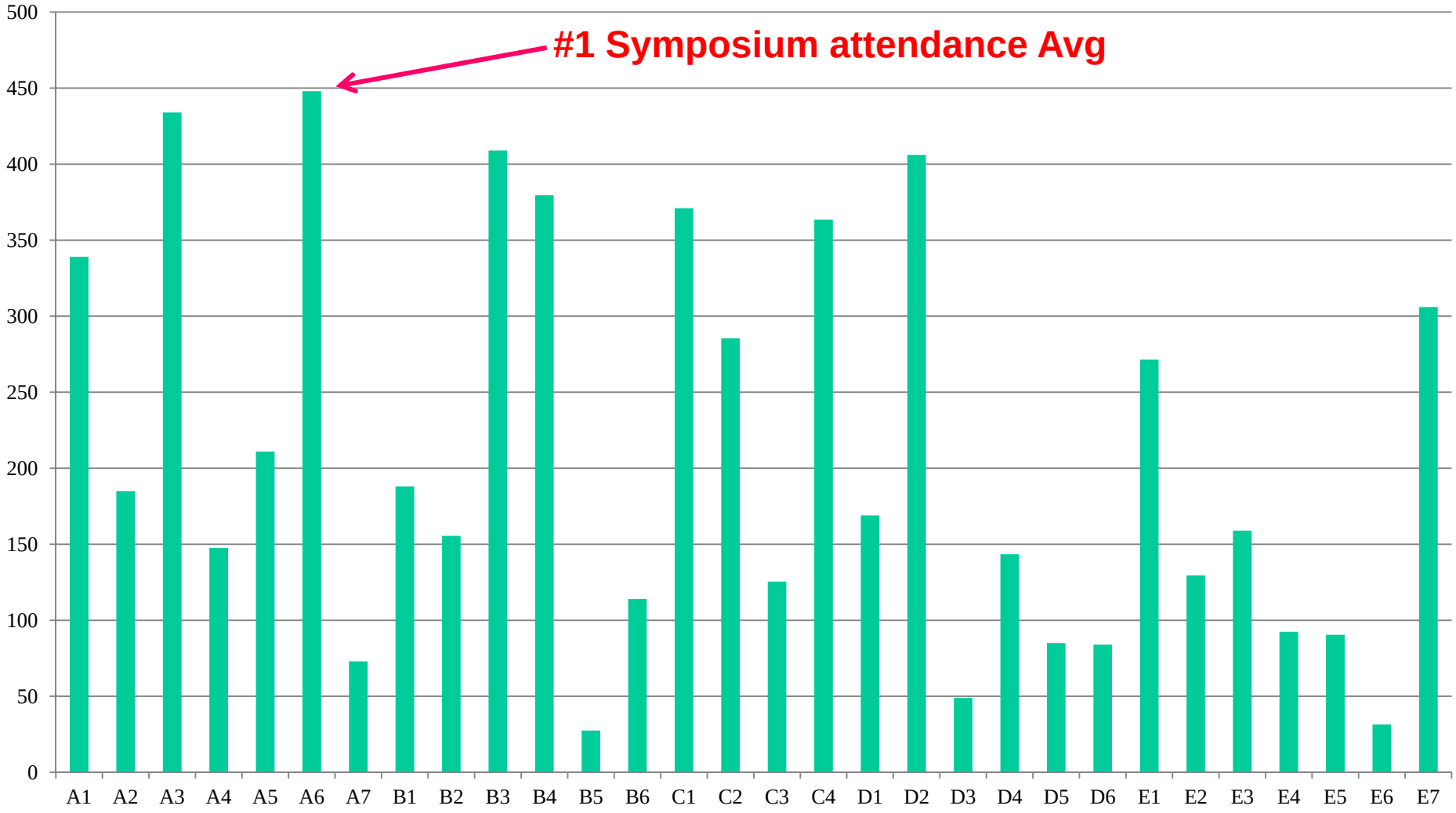
1.2. Feedback from Guadalajara 2016

Symposium attendance - average



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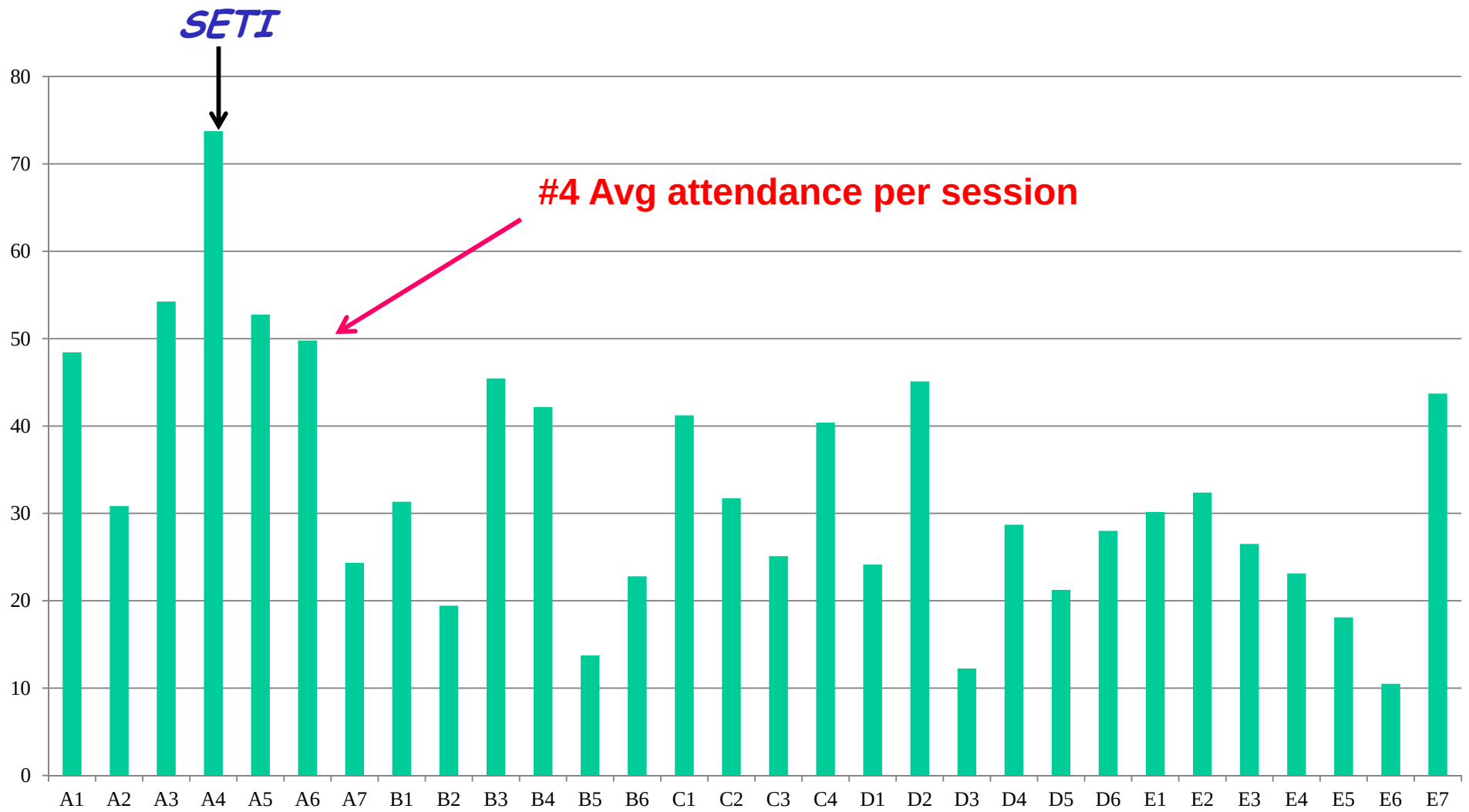
1.2. Feedback from Guadalajara 2016

Symposium attendance – average per session



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1.2. Feedback from Guadalajara 2016

SESSION ID	TECHNICAL SESSIONS	Min Att	Max Att	Avg Att	Papers Subm	Papers Sched	Papers Pres	Notified Withdraw	No Show	% Papers Selected	% Papers Present.	% Notified Withdrawn	% No Show
2016	A6. SPACE DEBRIS												
A6.1.	Measurements	45	50	47,5	19	10	8	2	0	53%	89%	11%	0%
A6.2.	Modeling and Risk Analysis	40	65	52,5	23	11	11	0	0	48%	100%	0%	0%
A6.3.	Hypervelocity Impacts and Protection	25	34	29,5	8	7	7	0	0	88%	90%	10%	0%
A6.4.	Mitigation and Standards	35	60	47,5	10	10	10	0	0	100%	73%	27%	0%
A6.5.	Space Debris Removal Technologies	43	64	53,5	18	11	9	2	0	61%	78%	22%	0%
A6.6.	Space Debris Removal Concepts	42	80	61	32	11	8	3	1	34%	75%	17%	18%
A6.7	Operations in Space Debris Environment, Situational Awareness	35	45	40	15	10	9	0	1	67%	89%	11%	0%
A6.8	(Joint Session with Space Security Committee): Policy, Legal, Institutional and Economic Aspects of Space Debris Detection, Mitigation and Removal	45	64	54,5	16	11	7	3	1	69%	63%	37%	0%
A6.9	Modelling and Orbit Determination	55	69	62	13	10	7	3	0	77%	50%	50%	0%
	TOTAL	365	531	448	154	91	76	13	3	59%	79%	21%	2%

Statistics:

- **Rather well equilibrated among sessions**
- **HVI - Protection A6.3 a bit weak as usual, due to hyper-specialization**
- **A6.2: 11 papers presented may be a bit to high but no withdrawal, as usual…**
- **A6.6: highest "maximal attendance" of the symposium**
- **A6.9: highest "average attendance" of the symposium**
- **Average attendance per session: 59 (max), 50 (avg), 41 (min)**
  - ⇨ **Highest score of the complete congress, but**
  - ⇨ **Lowest ever for our Symposium (almost equal to Guadalajara)**
- **Nearly 80% papers presented wrt selected: good figure at IAC level, but A6.8: 4 missing out of 11**
- **All reports handled by Rapporteurs; thank you!**

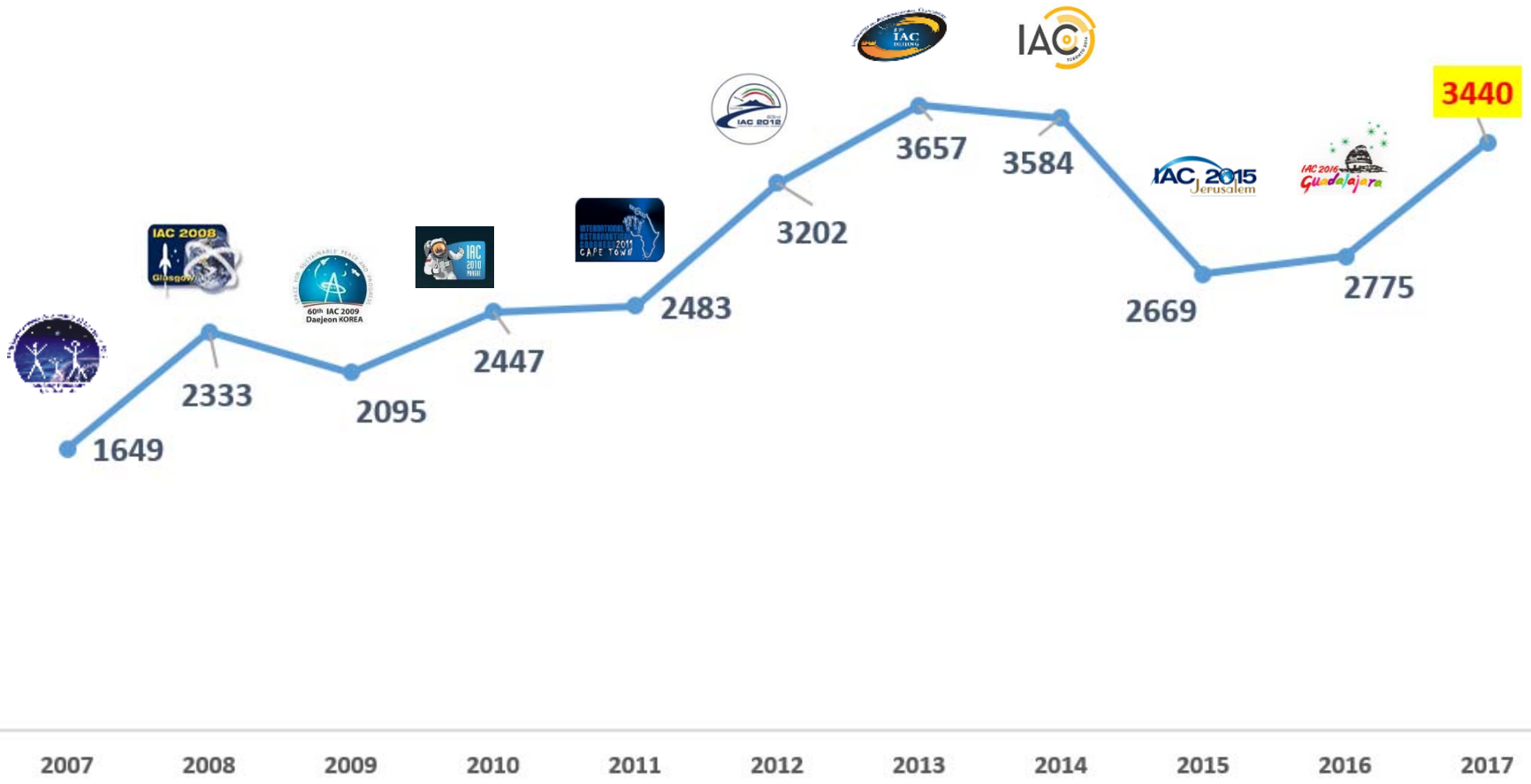
1.3 General statistics on Symposium A6

Dedicated document in Appendix 2:

- Evolution of the number of sessions
- Attendance evolution per year
- Attendance per session
- Rejection rate
- Ratio of presented papers
- Analysis per session
    - ⇨ Attendance
    - ⇨ Submitted, Selected, Presented
- Synthesis

↳ Proposal to have a small working group to analyze these statistics and suggest evolutions

Abstract Submissions Status



3440 abstracts = Good score this year!

(average over 10 years = 2869)

Technical Programme Status

68TH IAC
ADELAIDE 2017

- **Abstracts in total: 3440**
- **Abstracts accepted: 2496** — **73%**
  - incl. **1965 Oral Presentations** — **57%**
  - **531 Interactive Presentations** — **16%**
- **Abstracts rejected: 911** — **26%**

Figures as of 22/09/2017

- **Manuscripts uploaded: 1587** — **63%**
- **Interactive Presentations uploaded: 278** — **52%**

- **Confirmed presentations: 1895** — **76%**
- **Withdrawn presentations: 501** — **20%**
- **Unconfirmed: 100**

So far, 4400 registrations!

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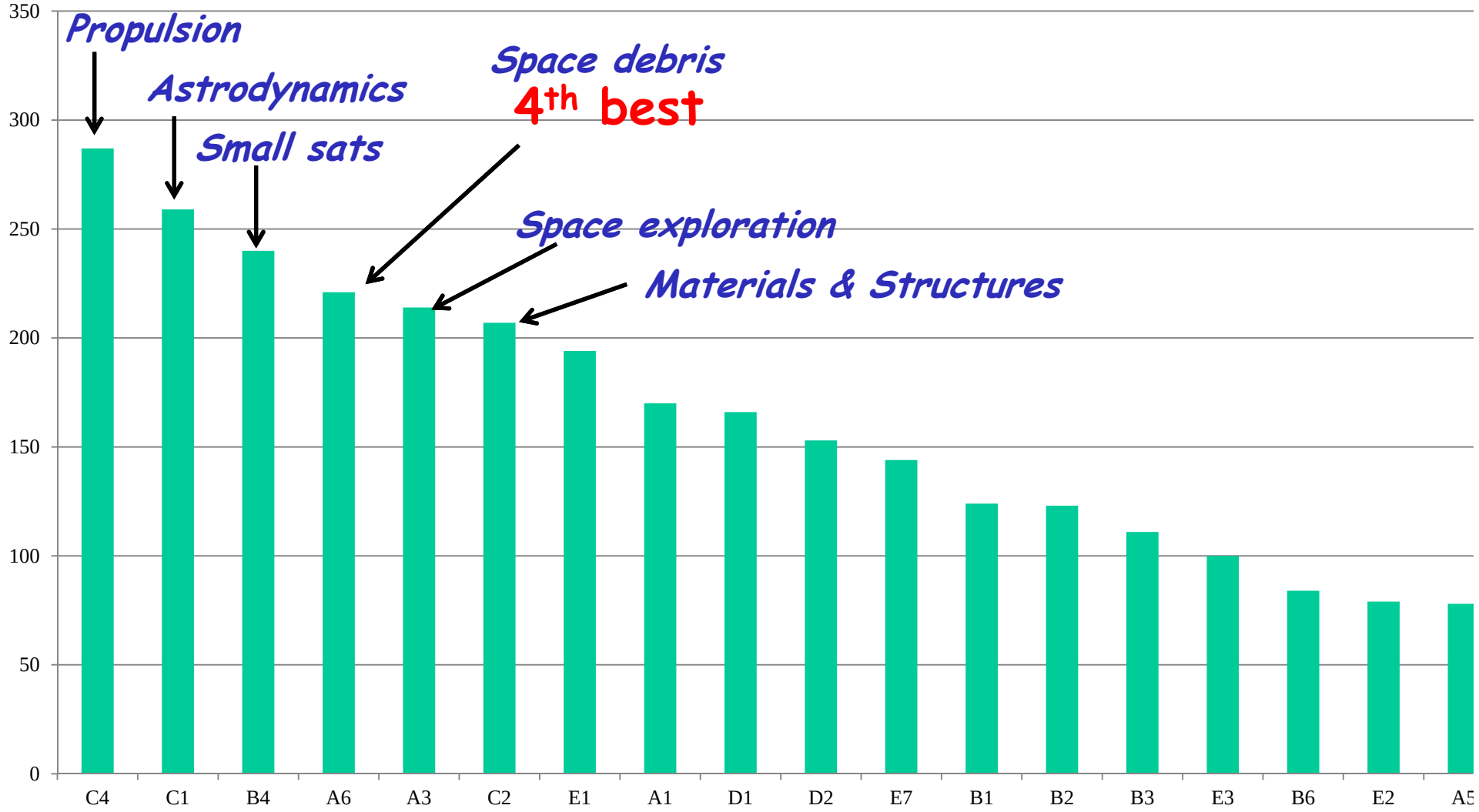
1.4. Adelaïde 2017

Abstracts per symposium



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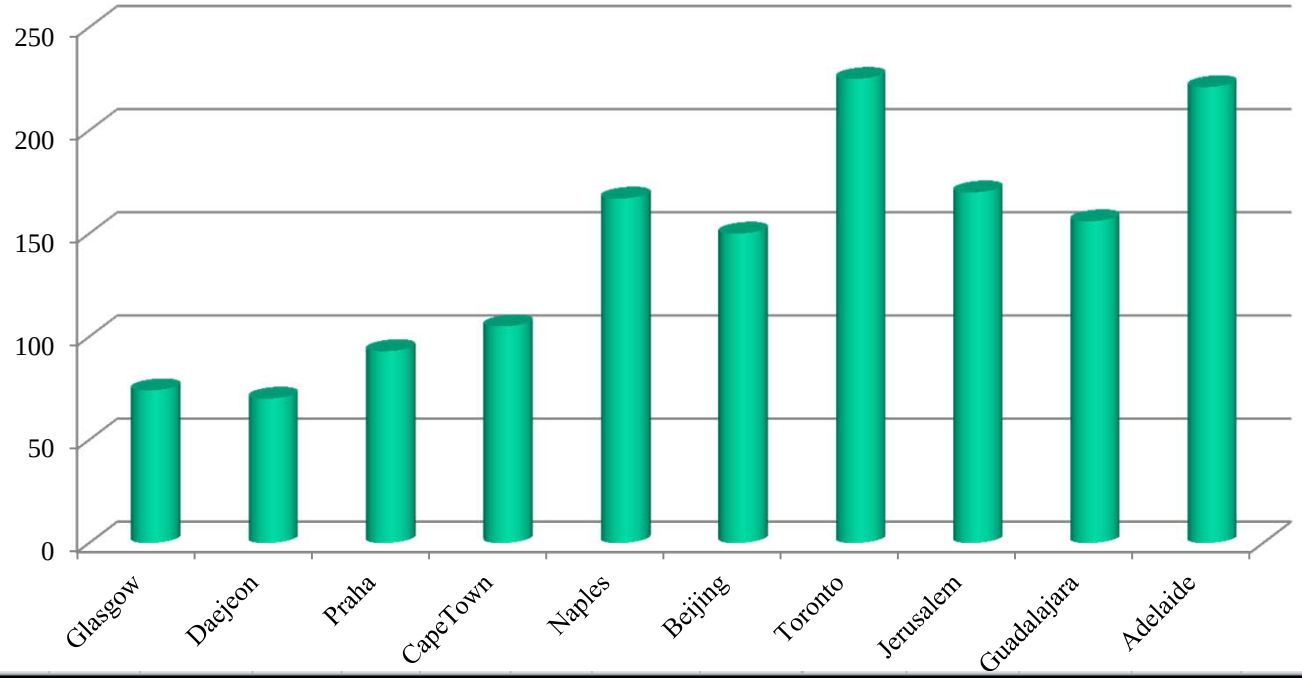
1.4. Adelaïde 2017

Number of abstracts, Space Debris Symposium, since 2008



Date	# Sess	Att Min	Att Max	Att Ave	Att/session	Pap Sub	Pap Acc	Pap Pres	Pap Wd	Pap No-Sh	Up Manu	% Pap Rej	% Pap Acc	% Pap Pres	% Pap Wd	% Pap No-Sh	% Up Manu vs Acc	% Up Manu vs Pres
2017	10					208	151		22			27%	73%		15%			
2016	9	365	531	448	49,8	154	91	76	13	3	75	41%	59%	84%	14%	3%	82%	99%
2015	10	374	521	448	44,8	165	96	72	20	4	73	42%	58%	75%	21%	4%	76%	101%
2014	9	492	653	572,5	63,6	223	95	77	14	4	74	57%	43%	81%	15%	4%	78%	96%
2013	8	360	521	440,5	55,1	164	79	67	10	4	63	52%	48%	85%	13%	5%	80%	94%
2012	7	270	348	309	44,1	167	55	41	10	4	55	67%	33%	75%	18%	7%	100%	134%
2011	6	285	375	330	55,0	105	58	47	10	1	48	45%	55%	81%	17%	2%	83%	102%
Avg	8,4	357,7	491,5	424,6	50,4	169,4	89,3	63,3	14,1	3,3	64,7	47%	53%	80%	16%	4%	83%	104%

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1.4. Adelaïde 2017

Number of Oral sessions, Space Debris Symposium, since 2000 + Interactive Presentation session,

IAC	Year	Location	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	Session 8	Session 9	Session 10
51st	2000	Rio de Janeiro										
52nd	2001	Toulouse										
53rd	2002	Houston										
54th	2003	Bremen										
55th	2004	Vancouver										
56th	2005	Fukuoka										
57th	2006	Valencia										
58th	2007	Hyderabad										
59th	2008	Glasgow										
60th	2009	Daejeon										
61st	2010	Praha										
62nd	2011	Capetown										
63rd	2012	Naples						Joint				
64th	2013	Beijing										
65th	2014	Toronto								Joint		
66th	2015	Jerusalem								Joint		Joint
67th	2016	Guadalajara								Joint		
68th	2017	Adelaide								Joint		Joint

- **11 sessions including IP**
- **2 joint sessions with Space Security and Small Satellites**
- **Leads to some overlapping**

Thank you to those who answered the mails… Room for improvement !

A6: Space Debris Symposium: Liou – Bonnal

The Symposium will address the complete spectrum of technical issues of space debris: measurements, modelling, risk assessment in space and on the ground, reentry, hypervelocity impacts and protection, mitigation and standards, and Space Surveillance.

A6.1: Measurements: DiPentino - Schildknecht – Agapov

This session will address advanced ground and space-based measurement techniques, relating processing methods, and results of space debris characterization.

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

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 avoidance.

A6.3: Hypervelocity Impacts and Protection: Fitz-Coy – Schäfer – Francesconi

The session will address passive protection, shielding and damage predictions. Shielding aspects will be supported by experimental and computational results of HVI tests. Use of HVI techniques for debris mitigation.

A6.4: Mitigation and Standards: Finkleman – Cazaux – Krag

This session will focus on the definition and implementation of debris prevention and reduction measures and vehicle passive protection. The session will also address space debris mitigation guidelines and standards that exist already or are in preparation at the national or international level.

A6.5: Space Debris Removal Issues: Santoni – Bastida-Virgili – Piergentili

This session will address active removal techniques “ground and space based”, review potential solutions and Identify implementation difficulties.

A6.6: Space Debris Removal Concepts: Berend – ~~Innocenti~~ Biesbroek - Singh

This session will address active removal techniques “ground and space based”, review potential solutions and identify implementation difficulties.

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

Kelso – Dolado-Perez – Wiedemann

This session 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.

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

Plattard – McKnight – *Soucek* - Spencer

This session will deal with the non-technical aspect of space debris mitigation and removal. Political, legal and institutional aspects includes role of IADC and UNCOPUOS and other multilateral bodies. Economic issues including 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

Jah – Klinkrad – Lewis

This session will address aspects of space debris orbit determination related to assessment of raw and derived data accuracy, optical measurements processing and modelling and risk analysis of space debris

A6.10/B4.10: Joint Small Satellite/Space Debris session to promote the long-term sustainability of space

Rossettini - Oltrogge – Cazaux – *Laufer – De Silva Curiel*

This session facilitates bilateral discussions between Small Satellite and Space Debris communities for shared understanding of the challenges/issue and to promote practical small satellite solutions for the long-term sustainability of space.

A6.IP: Interactive Presentations, Yasaka – McKnight – Bonnal

A6: Space Debris Symposium Number of Abstracts

Selected – Confirmed – Withdrawn – Paper - Presentation

A6.1: Measurements: 10 – 8 – 2 – 6 – 5

A6.2: Modelling and Risk Analysis: 11 – 10 – 1 – 9 – 7

A6.3: Hypervelocity Impacts and Protection: 11 – 6 – 4 – 5 – 5

A6.4: Mitigation and Standards: 10 – 10 – 0 – 8 – 5

A6.5: Space Debris Removal Issues: 11 – 10 – 1 – 10 – 9

A6.6: Space Debris Removal Concepts: 10 – 9 – 1 – 9 – 6

A6.7: Operations in Space Debris Environment, Situational Awareness: 9 – 9 – 0 – 8 – 6

A6.8 (joint with Space Security Committee): 10 – 7 – 3 – 7 – 4

A6.9: Orbit Determination and Propagation: 12 – 8 – 3 – 9 – 8

A6.10-B4.10: (joint with Small Satellites) : 12 – 9 – 3 – 9 – 6

A6.IP: Interactive Presentations: 45 – 37 – 6 – 18 – 30

Total without IP: 106 – 86 – 17 – 80 – 61

1.4. Adelaïde 2017

Recall of a few basic rules

- No paper, no show:
  - check that the paper is effectively loaded before the session
- No show, no paper:
  - If the author doesn't present, the paper will be removed from proceedings

- Status of the presenters:
  - Are we sure the authors will show up ?
  - Do we have their short bios ?
  - Try to contact them and ask to come 15' in advance to check that everything is OK, Powerpoint, Videos…

- Timing may be critical !
  - Please, do not overpass the standard 3 hours, except if there is nothing after
  - Clear identified problem and danger on Friday…
  - Have clear rules explained to speakers in advance
  - Keep time for Q&A (except Friday)

- Publications: no dedicated IAC issue of Acta Astronautica any more
  - Selection of 2 or 3 best papers, if any !
  - Chairs and Rapporteurs may be asked to act as Peer Reviewers

- The synthesis session sheets shall be given back to IAF secretariat, but please keep a copy and send it to JC, Heiner and me, or just hand them directly to me

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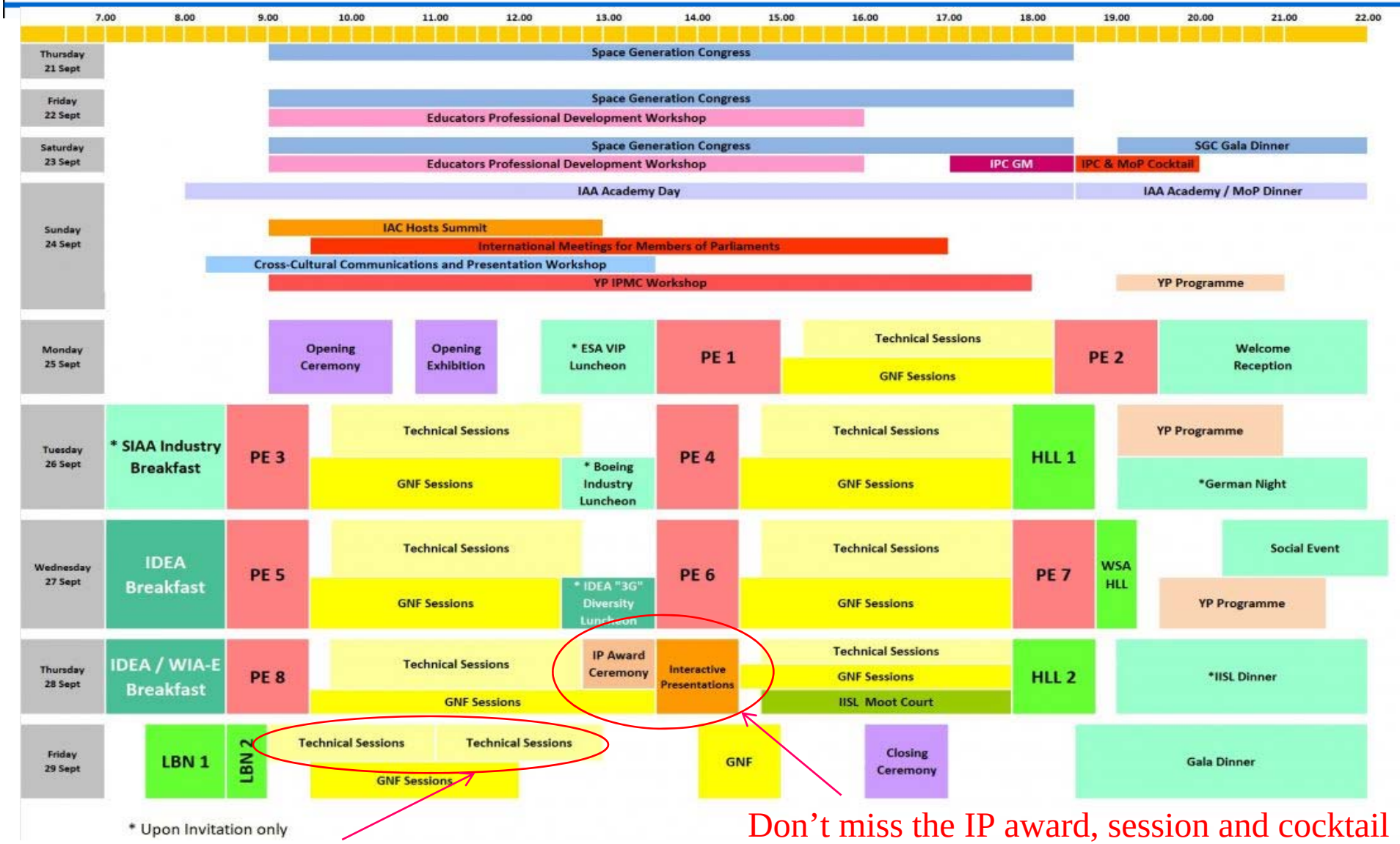
1.4. Adelaïde 2017



Major reschedule on Friday

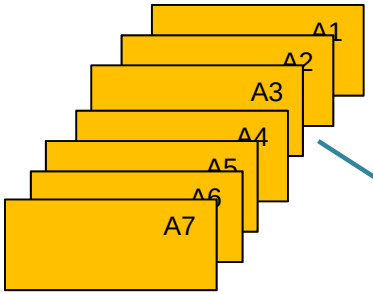
Don’t miss the IP award, session and cocktail

IP Award Ceremony

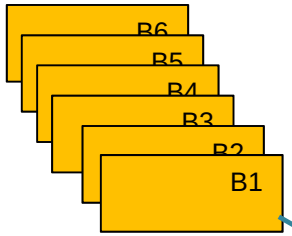
- **5 Awards** (1 per category)
  - A. Science and Exploration
  - B. Applications and Operations
  - C. Technology
  - D. Infrastructure
  - E. Space and Society

- **Prize** (for each awardee)
  - Cash Prize
  - Gala Dinner ticket
  - A Certificate
  - An IAF Capsule (which will be broadcasted on the IAF Social networks)

IP Competition Process



3 Nominees by symposiums



Category A
Science & Exploration
Judge: M. Perino

Category B
Applications & Operations
Judge O. Koudelka

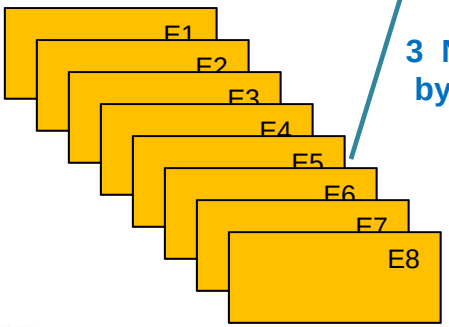
1 best + 2 back up by Category

Selection of 5 best IP's

Category C
Technology
Judge: Li Ming

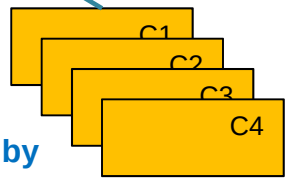
Category D
Infrastructure
Judge : JD. Bartoe

Category E
Space & Society
Judge : L.Wigbels

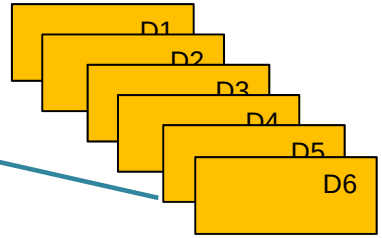


3 Nominees by symposiums

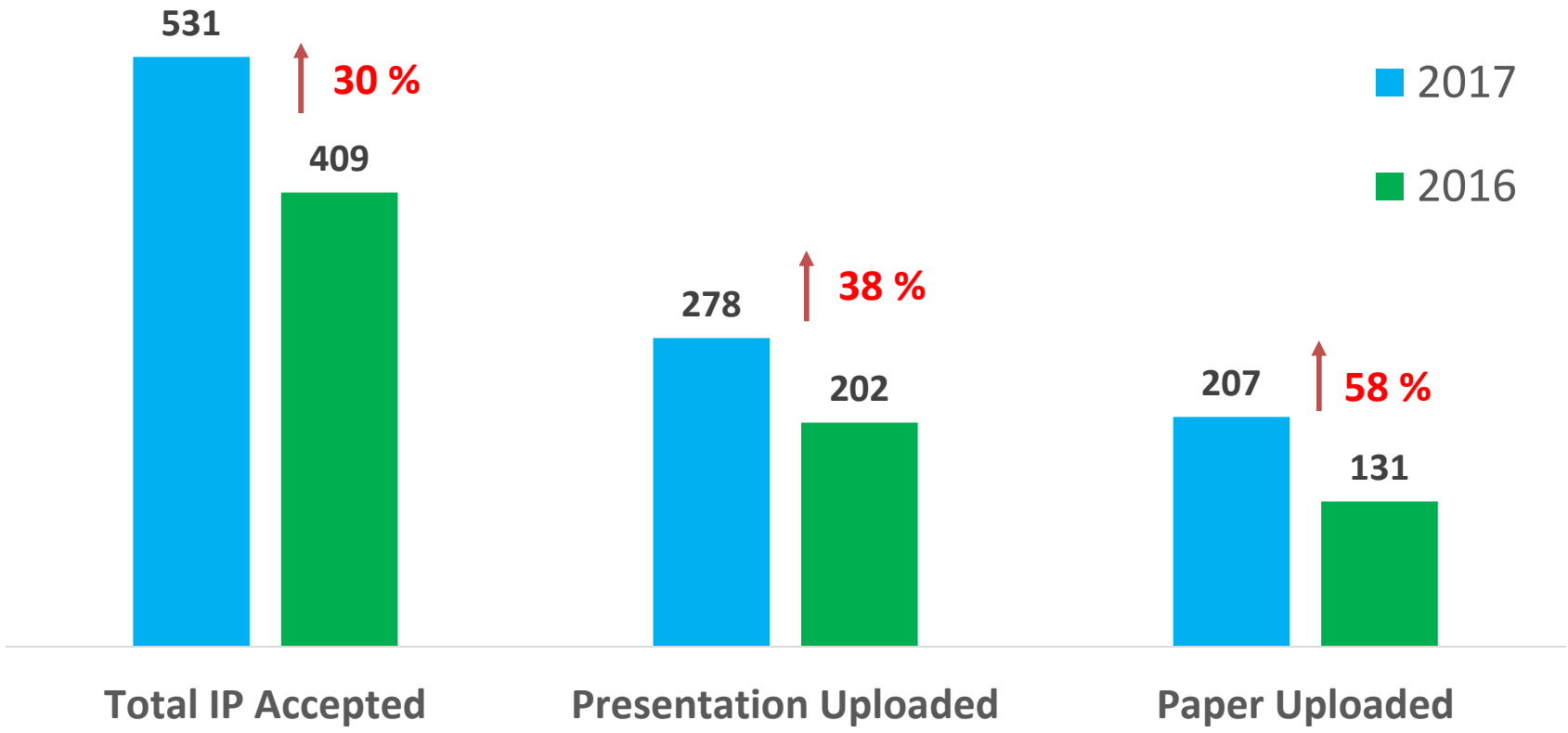
1 best + 2 back up by Category



3 Nominees by symposiums



Statistics 2017



Interactive Presentation

Time	Screen 1	Screen 2	Screen 3	Screen 4	Screen 5	Screen 6	Screen 7	Screen 8	Screen 9	Screen 10	
Symposium	A1	A1	A2+A5	A3	A3	A3+A7	A6	A6	A6	B1	
13:15-13:20	IAC-17/A1/IP/1/x40208	IAC-17/A1/IP/20/x41696	IAC-17/A2/IP/1/x38877	IAC-17/A3/IP/1/x38719	IAC-17/A3/IP/20/x37441	IAC-17/A3/IP/42/x39325	IAC-17/A6/IP/1/x39638	IAC-17/A6/IP/14/x38951	IAC-17/A6/IP/33/x40632	IAC-17/B1/IP/1/x40989	1
13:20-13:25	IAC-17/A1/IP/3/x38441	IAC-17/A1/IP/21/x40600	IAC-17/A2/IP/2/x39247	IAC-17/A3/IP/3/x38365	IAC-17/A3/IP/21/x39144	IAC-17/A3/IP/44/x39185	IAC-17/A6/IP/2/x38114	IAC-17/A6/IP/15/x38273	IAC-17/A6/IP/34/x40610	IAC-17/B1/IP/2/x37393	1
13:25-13:30	IAC-17/A1/IP/4/x40182	IAC-17/A1/IP/23/x41015	IAC-17/A5/IP/2/x37599	IAC-17/A3/IP/5/x38396	IAC-17/A3/IP/22/x37728	IAC-17/A3/IP/45/x39995	IAC-17/A6/IP/3/x40174	IAC-17/A6/IP/16/x39503	IAC-17/A6/IP/35/x40460	IAC-17/B1/IP/3/x38992	1
13:30-13:35	IAC-17/A1/IP/5/x40211	IAC-17/A1/IP/24/x38050	IAC-17/A5/IP/4/x38148	IAC-17/A3/IP/6/x38415	IAC-17/A3/IP/23/x37891	IAC-17/A3/IP/46/x41331	IAC-17/A6/IP/4/x40107	IAC-17/A6/IP/17/x38073	IAC-17/A6/IP/36/x37651	IAC-17/B1/IP/4/x38857	1
13:35-13:40	IAC-17/A1/IP/7/x40682	IAC-17/A1/IP/25/x39169	IAC-17/A5/IP/5/x35964	IAC-17/A3/IP/7/x38230	IAC-17/A3/IP/25/x41290	IAC-17/A3/IP/48/x38075	IAC-17/A6/IP/5/x37746	IAC-17/A6/IP/20/x37916	IAC-17/A6/IP/37/x37668	IAC-17/B1/IP/6/x38304	1
13:40-13:45	IAC-17/A1/IP/9/	IAC-17/A1/IP/26	IAC-17/A5/IP/6/	IAC-17/A3/IP/9/	IAC-17/A3/IP/27	IAC-17/A3/IP/49	IAC-17/A6/IP/6/	IAC-17/A6/IP/21	IAC-17/A6/IP/38	IAC-17/B1/IP/7/	1

- **Extract from the complete program**
- **A6: 3 screens #7, 8 and 9**
- **5 minutes per paper, from 13:15 to 14:45 : 38 IPs for A6**

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1.4. Adelaïde 2017

*Upon Invitation Only

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1.4. Adelaïde 2017

Time / Room (Monday - Thursday)	25/09/2017	26/09/2017	26/09/2017	27/09/2017	27/09/2017	28/09/2017	28/09/2017	Time / Room (Friday)	29/09/2017	29/09/2017
	15:15-18:15	09:45-12:45	14:45-17:45	09:45-12:45	14:45-17:45	09:45-12:45	14:45-17:45		09:00-11:00	11:00-13:00
Hall N	A3.1	A3.2A	A3.2B	A3.3A	A3.3B	A3.4A	A3.5	Hall N	A3.2C	A3.4B
Hall O	D2.1	D2.2	D2.7	D2.3	D2.4	D2.5	D2.6	Hall O	D2.8/A5.4	D6.2/D2.9
Hall A	C1.1	C1.2	C1.3	C1.4	C1.5	C1.6	C1.7	Meeting Room L6	C1.8	C1.9
Hall E1	A6.1	A6.2	A6.4	A6.3	A6.9	A6.5	A6.6	Hall E1	A6.7	A6.8
Panorama Room 1	B4.2	B4.1	B4.3	B4.4	B4.5	B4.6A	B4.6B	Panorama Room 1	B4.8	B4.7
Hall E2	B1.1	B1.2	A5.2	B1.3	A5.1	B1.6	B1.5	Hall E2	B1.4	B4.10/A6.10
City Room 3	B3.1	B3.2	B3.3	B3.4/B6.5	C3.3	B3.5	B3.6/A5.3	City Room 3	B3.7	B3.8/E7.7
Hall E3	C4.1	C4.2	C4.9	C4.3	C4.4	C4.5	C4.6	Hall E3	C4.7/C3.5	C4.8/B4.5A
Panorama Room 2	C2.1	C2.2	C2.3	C2.4	C2.5	C2.6	C2.7	Panorama Room 2	C2.8	C2.9
City Room 1	C3.1	C3.2	E5.1	E5.2	E5.3	E5.4	E5.5	City Room 1	B6.3	E8.1
City Room 2	A1.1	A1.2	A1.3	A1.4	A1.5	A1.6	C3.4	City Room 2	A1.7	A1.8
Panorama Room 3	E1.6	E1.3	E1.4	E1.8	E1.5	E1.7	E1.9	Panorama Room 3	E1.1	E1.2
Riverbank 3	D1.1	E6.1	D1.2	D1.3	D1.4A	D1.4B	D4.3	Riverbank 3	D1.5	D1.6
Meeting Room L2	E4.1	E7.1	E7.2	E7.3	E7.4	E4.3A	E4.2	Meeting Room L2	E7.5	E4.3B
Meeting Room L3	B2.1	B2.2	B2.3	B2.4	B2.5	B2.6	B5.2	Meeting Room L3	B5.1	B2.7
City Room 4	B6.1	E3.1	E3.2	E3.3	E3.4	E3.5/E7.6	B6.2	City Room 4	E3.6	C4.10
Hall B	A2.1	A2.2	A4.1	A2.3	A2.4	A4.2	A2.5	Meeting Room L1	A2.6	A2.7
Riiverbank 5	A7.1	A7.2	E6.2	D5.1	E6.3	D5.2	D5.3	Riverbank 5	D5.4	A7.3
Riverbank 4	D4.1	D3.1	E2.1	D3.2	D4.2	D3.4	D3.3	Riverbank 4	D4.5	D4.4
Riverbank 2	E2.3/GTS.4	D6.1	B4.9/GTS.5	E2.2	B3.9/GTS.2	D6.3	B2.8/GTS.3	Riverbank 2	E2.4	

Category A Science & Exploration A1--> A8
Category B Applications & Operations B1--> B6
Category C Technology C1--> C4
Category D Infrastructure D1--> D6
Category E Space and Society E1--> E8

- **Space debris sessions: Hall E1**
- **Joint session with Small Satellites: Hall E2**

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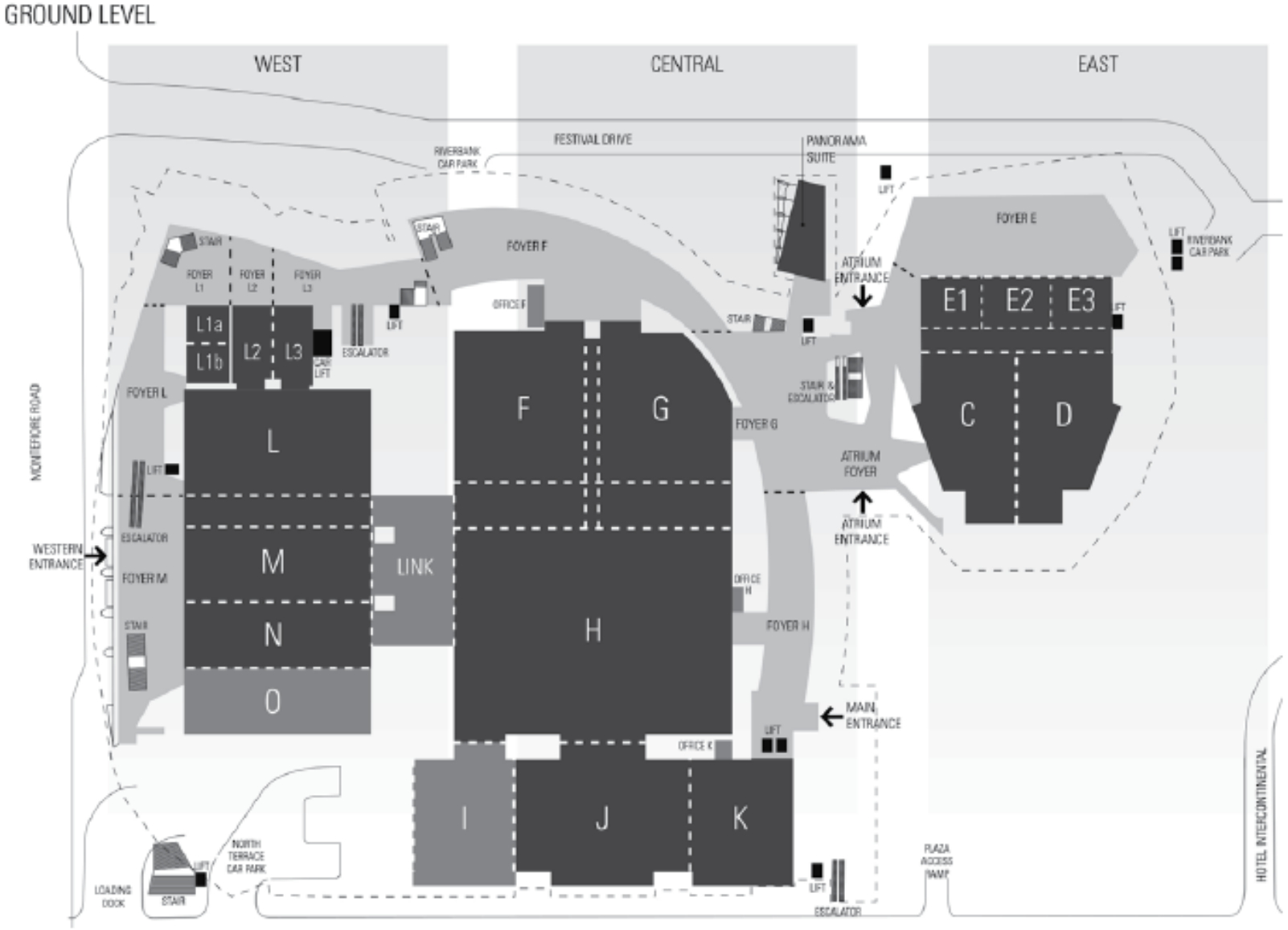
1.4. Adelaïde 2017



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1.5. Bremen 2018

IAC	Year	Location	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	Session 8	Session 9	Session 10	Posters
61st	2010	Praha	G. Stansbery [C]	C. Martin [C]	Adimurthy [R]	J. Hussey [C]	H. Krag [C]						
			S. Kibe [C]	P. Krisko [C]	H. Stokes [C]	F. Alby [C]	V. Agapov [C]						
			T. Schildknecht [R]	L. Anselmo [R]	C. Wiedemann [R]	H. Klinkrad [R]	M. Matney [R]						
62nd	2011	Capetown	T. Schildknecht [C]	C. Pardini [C]	S. Meshcheryakov [C]	F. Alby [C]	H. Klinkrad [C]	F. Piergentili [C]					
			V. Agapov [C]	D. McKnight [C]	F. Schaefer [C]	R. Crowther [C]	S. Kibe [C]	V. Kuprianov [C]					
			P. Seitzer [R]	C Wiedemann [R]	J. Hyde [R]	V. Adimurthy [R]	P. Anz-Meador [R]	M. Mulrooney [R]					
63rd	2012	Naples	P. Seitzer [C]	L. Anselmo [C]	J. Hyde [C]	F. Alby [C]	H. Klinkrad [C]	M. Yakovlev [C]	N. Johnson [C]				
			V. Agapov [C]	C Wiedemann [C]	A. Francesconi [C]	J. Hussey [C]	D. McKnight [C]	*K. Suzuki [C]*	C. Bonnal [C]				
			T. Schildknecht [R]	T. Hanada [R]	F. Schaefer [R]	F. Piergentili [R]	S. Kibe [R]	*C. Mathieu [R]*	M. Rudolph [R]				
64th	2013	Beijing	T. Schildknecht [C]	C. Pardini [C]	D. McKnight [C]	F. Alby [C]	V. Adimurthy [C]	P. Anz-Meador [C]	D. Finkleman [C]	*K. Suzuki [C]*			D. McKnight
			V. Agapov [C]	P. Krisko [C]	A. Francesconi [C]	H. Klinkrad [C]	J. Hussey [C]	S. Kibe [C]	D. McKnight [C]	P. Krisko [C]			C. Bonnal
			P. Seitzer [R]	C Wiedemann [R]	M. Rudolph [R]	M. Yakovlev [R]	F. Santoni [R]	M. Rudolph [R]	H. Krag [R]	*C. Mathieu [R]*			
65th	2014	Toronto	T. Schildknecht [C]	L. Anselmo [C]	A. Francesconi [C]	C. Cazaux [C]	VIP. Prasad [C]	F. Di Pentino [C]	T.S. Kelso [C]	*B. Biddington [C]*	M. Jah [C]		C. Bonnal
			V. Agapov [C]	J-C. Liou [C]	Sen Liu [C]	H. Klinkrad [C]	F. Piergentili [C]	S. Kibe [C]	D. Finkleman [C]	D. McKnight [C]	S. Flegel [C]		
			J. Carroll [R]	T. Hanada [R]	F. Schaefer [R]	M. Yakovlev [R]	N. Berend [R]	C. Bonnal [R]	JC. Dolado-Perez [R	*C. Mathieu [R]*	H. Lewis [R]		
66th	2015	Jerusalem	F. DiPentino [C]	C. Pardini [C]	N. Fitz Coy [C]	H. Krag [C]	MYS. Prasad [C]	N. Berend [C]	T.S. Kelso [C]	*B. Biddington [C]*	M. Jah [C]	C. Mathhieu [C]	T. Yasaka
			T. Schildknecht [C]	M. Sorge [C]	F. Schaefer [C]	C. Cazaux [C]	F. Piergentili [C]	S. Kibe [C]	J-C. Dolald-Perez [C	D. McKnight [C]	H. Klinkrad [C]	*K. Stube [C]*	D. McKnight
			V. Agapov [R]	S. Flegel [R]	A. Francesconi [R]	A. Kato [R]	F. Santoni [R]	JC. Liou [R]	D. Finkleman [R]	*C. Mathieu [R]*	H. Lewis [R]	C. Bonnal [R]	C. Bonnal
67th	2016	Guadalajara	D. Oltrogge [C]	C. Pardini [C]	N. Fitz Coy [C]	H. Krag [C]	S. Kibe [C]	N. Berend [C]	T.S. Kelso [C]	*S. Plottard [C]*	M. Jah [C]		T. Yasaka
			T. Schildknecht [C]	M. Sorge [C]	F. Schaefer [C]	C. Cazaux [C]	F. Piergentili [C]	L. Innocenti [C]	J-C. Dolald-Perez [C]		H. Klinkrad [C]		D. McKnight
			V. Agapov [R]	B. Bastida-Virgili [F	A. Francesconi [R]		F. Santoni [R]	G. Haussmann [R]	C Wiedemann [R]	D. Finkleman [R]			C. Bonnal
68th	2017	Adelaide	F. DiPentino [C]	C. Pardini [C]	F. Schaefer [C]	C. Cazaux [C]	B. Bastida-Virgili [C]	N. Berend [C]	T.S. Kelso [C]	D. McKnight [C]	H. Klinkrad [C]	D. Oltrogge [C]	T. Yasaka
			T. Schildknecht [C]	D. Oltrogge [C]	N. Fitz Coy [C]	D. Finkleman [C]	F. Santoni [C]	L. Innocenti [C]	J-C. Dolald-Perez [C	*S. Plottard [C]*	M. Jah [C]	L. Rossettini [C]	D. McKnight
			V. Agapov [R]	M. Sorge [R]	A. Francesconi [R]	H. Krag [R]	F. Piergentili [R]	B. Singh [R]	C Wiedemann [R]	A. Soucek [R]	H. Lewis [R]	C. Cazaux [R]	C. Bonnal
69th	2018	Bremen	F. DiPentino [C]	L. Anselmo [C]	N. Fitz Coy [C]	H. Krag [C]	F. Piergentili [C]	N. Berend [C]	C Wiedemann [C]	D. Spencer [C]	S. Kibe [C]	M. Jah [C]	T. Yasaka
			T. Schildknecht [C]	D. Oltrogge [C]	F. Schaefer [C]	P. Omaly [C]	B. Bastida-Virgili [C]	B. Singh [C]	T.S. Kelso [C]	A. Anilkumar [R]	H. Lewis [C]	T. Schildknecht [R]	D. McKnight
			V. Agapov [R]	M. Sorge [R]	D. McKnight [R]	D. Finkleman [R]	F. Santoni [R]	L. Rossettini [R]	J-C. Dolald-Perez [R]		H. Klinkrad [R]		C. Bonnal

- Need to rotate a bit, and to offer slots to new-comers
- But, need to find reliable colleagues who will effectively attend and will effectively work…☺

A6: Space Debris Symposium: Liou – Bonnal

The Symposium will address the complete spectrum of technical issues of space debris: measurements, modelling, risk assessment in space and on the ground, re-entry, hypervelocity impacts and protection, mitigation and standards, post-mission disposal, debris removal, Space Surveillance, collision avoidance as well as non-technical topics.

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

This session will address advanced ground and space-based measurement techniques, relating processing methods, and results of space debris characterization.

A6.2: Modelling and Risk Analysis: Anselmo – Oltrogge – Sorge

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 avoidance.

A6.3: Impact-Induced Mission Effects and Risk Assessments: McKnight– Schäfer –Fitz-Coy

This session addresses disruptions of spacecraft operations induced by hypervelocity impacts including spacecraft anomalies, perturbation of operations, and component failures up to mission loss. 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 and Standards : status, lessons learnt and future with smallsats and constellations: Krag – Omaly – Usovik

This session will focus on the definition and implementation of debris prevention and reduction measures and vehicle passive protection. The session will also address space debris mitigation guidelines and standards that exist already or are in preparation at the national or international level, the effect of the existing standards on the population in orbit, the end of life practices and the atmospheric reentry with the associated risks. The session will also cover the necessary evolutions of standards and mitigations rules to answer to the introduction of numerous smallsats and constellations in order to preserve long term sustainability of space activities

A6.5: Post Mission Disposal and Space Debris Removal 1: Piergentili – Bastida-Virgili – Santoni

This session 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: Berend – Singh – Rossettini

This session 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:

Wiedemann – Kelso – Dolado-Perez

This session 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.

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

From SDC: Spencer – Lemay *From SSC: Plattard – Soucek*

This session will deal with the non-technical aspect of space debris mitigation and removal. Political, legal and institutional aspects includes role of IADC and UNCOPUOS and other multilateral bodies. Economic issues including 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

Jah – Lewis – Klinkrad

This session will address aspects of space debris orbit determination related to assessment of raw and derived data accuracy, optical measurements processing and modelling and risk analysis of space debris

A.6.10 /C1.7: Joint Symposium Astrodynamics/Space Debris "Orbital Safety and Optimal Operations in an Increasingly Congested Environment"

From A6: Kitazawa – Anilkumar *From C1: Jah*

This joint session will concern itself with the technical challenges driven by salient problems in space debris and space traffic that can be well informed by contributions from the field of astrodynamics (the science that studies the motion of objects in space). Specific issues regarding long-term population assessments and predictions, safely operating NextGen (large) Constellations, determining the data and modeling requirements to uniquely identify and predict the motion of objects in space (e.g. class specific), discovering and developing improved methods of debris mitigation and remediation founded upon forces and torques, development of semi-analytical theories relevant to specific classes and types of orbital debris, etc. are of relevance to this joint session.

A6.IP: Interactive Presentations, Yasaka – McKnight – Bonnal

1.5. Bremen 2018

Two important points concerning Bremen 2018:

Request from B4 Small Satellites to have a joint session:

- Same definition as in Adelaïde
- But then 11 sessions + IP
- Could benefit from experience of Adelaïde
- But could “break” the impetus of this thematics
- Decision could wait until Friday evening after the session
- But probable problem due to the rescheduling of Fridays’ sessions

↳ **Decision No for Bremen 2018, to be analyzed for Washington 2019**

As a consequence, program on web-site is not correct:

- Session with small-satellites already identified as A6.10
- Joint session with Astrodynamics identified as A6.11

↳ **Need to clarify rapidly:**

⇨ **Done, following exchanges with IAF secretariat on Oct. 6th.**

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2.1. Past events

- ***7th European Conference on Space Debris***
  - ESA/ESOC, Darmstadt/Germany, 18 - 21 April 2017.
  - See debriefing in **Appendix 3**
- ***Advancement Maui Optical and Space Surveillance Technologies (AMOS) Conference,***
  - 19-22 September 2017, Maui, Hawaii.
  - Conference website: http://amostech.com/
- ***7th EUCASS 2017,***
  - European Conference for Aeronautics and Space Sciences
  - Politecnico di Milano – Campus Bovisa, Milan, Italy 3-6 July 2017
  - 600+ participants from 35+ countries
  - 4 sessions devoted to debris, 32 papers (out of 650), Chaired by Luciano Anselmo
  - Papers available on EUCASS web site: Ask Christophe
  - Special Issue in Acta Astronautica ongoing
  - Conference website: http://www.eucass2017.eu/

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2.2. On the agenda

- ***9th International Association for the Advancement of Space Safety (IAASS) Conference "Know Safety, No Pain"***,
  - 18-20 October 2017, Toulouse, France.
  - Conference website: http://iaassconference2017.space-safety.org/

- ***1st Spacecraft and Environmental Anomalies workshop (with IAASS), Toulouse, 16-17 October 2017***
  Already done 4 times in US, but first time international
  Associated with the IAASS conference
  See the draft folder in following pages
  Appendix 7

- ***5th International Workshop on Modeling and Remediation***
  - Paris, CNES HQ, 25 – 27 June 2018
  - IPC: NASA, JAXA, Roscosmos, CNSA, ESA, DLR, UKSA, ISTI-CNR

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2.2. On the agenda

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2.2. On the agenda

- The *1st IAA Conference on Space Situational Awareness (ICSSA),* 13-15 November 2017, Orlando, Florida. The abstract deadline is: 30 June 2017 (3rd attached).

Conference website: http://reg.conferences.dce.ufl.edu/ICSSA/1357

- ***ESA Space Debris Re-entry Workshop***
  - ESOC - Damstadt, Feb. 28th – Mar. 1st 2018
  - See **appendix 4**

- ***7th Satellites End of Life Workshop***
  - Thursday January 25, 2018
  - CNES Headquarter PARIS

The objectives of this 1-day workshop are:
- to inform the satellites operators on the existing guidelines and their evolutions,
- to exchange information about recent operations (reorbiting or deorbiting maneuvers, passivation)
- to get feedback in order to identify implementation difficulties and possible evolutions of the guidelines

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2.2. On the agenda

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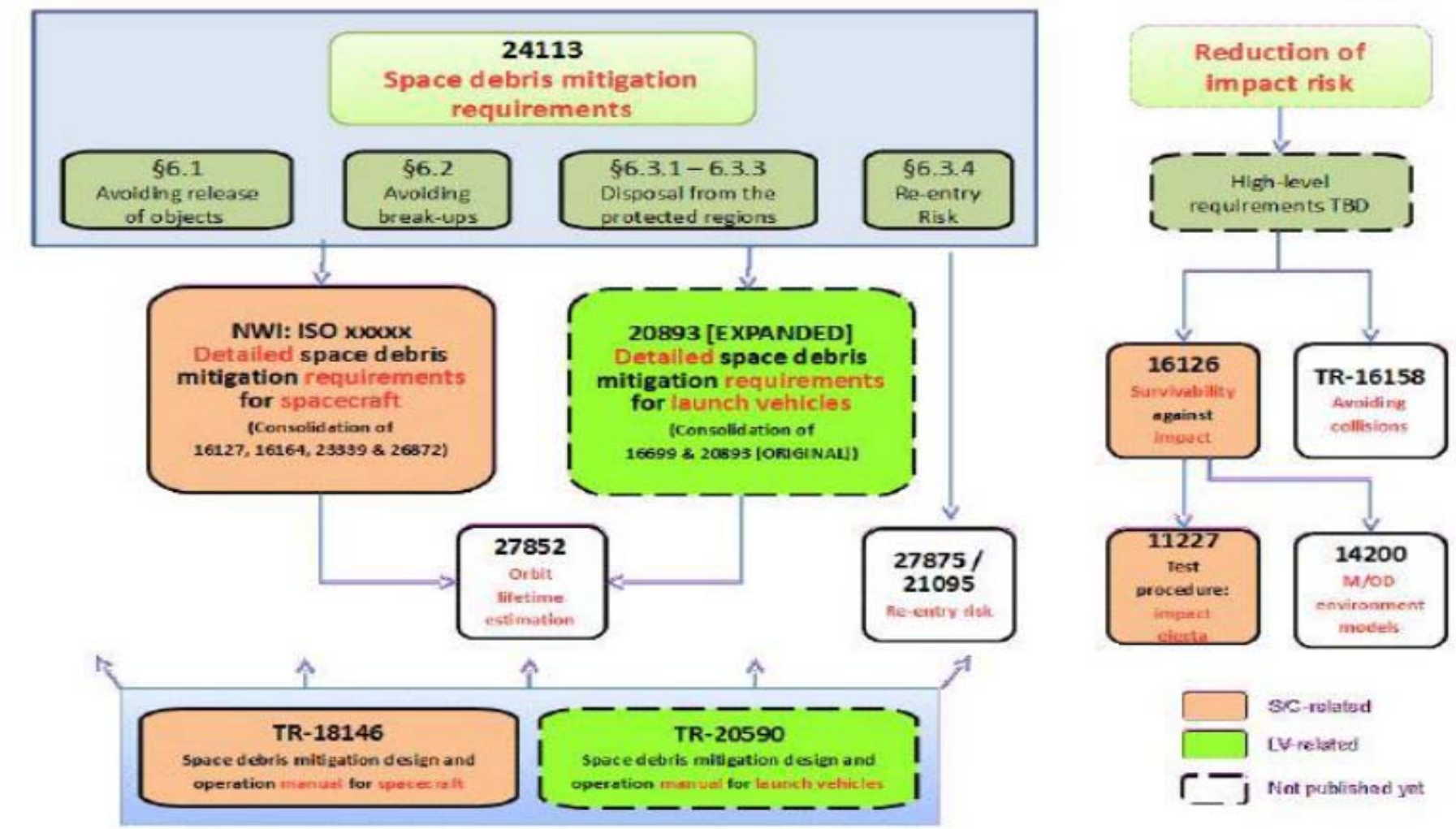
2.3. New achievements

- **New structure for the ISO documentation**



2.4. Round table

Open discussion

- **Evolution of the French Space Operations Act**
  - See **appendix 5**
- **IAA Publication at UNISEC Global**
  - Problem with the content of an IAA publication not coordinated with our Committee and presenting very unrealistic contents.
  - Exchanges on the topic are in **appendix 6**
- **ESA Space Environment Report**
  - See appendix 7
- **Study of this group ongoing, chaired by Darren**
  - See SG 4.23 (Rei Kawashima)
- **New Russian Standard :**
  - See session A6.4
- **Dr. Moriba Jah testimony to congress on July 13th, 2017:**
  - The FAA has a “green light” to perform a pilot program to assess the ability to provide the community with orbital safety related SSA products. The DoD is keen to move this function out of its ranks and possibly to a civil government entity, still to be determined.
  - See appendixes 8.1 and 8.2

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3. IAA Studies

- **IAA studies: general status for your information**

SG No	IAA Study Groups as of September 18, 2017 ongoing IAA Studies	Chair/Co-Chair/Secretary	1 Proposal	2 Com. ok	3 SAC ok	4 Appoint.	5 1st Draft	6 Final Draft	7 Peer Review	8 Final Report	9 SAC ok	10 BOT ok	11 Edition	12 Publication	Comments
	Commission 1														
1.6	Protected Antipode Circle on Lunar Farside	Maccone/Shuch													
1.9	Satellite remote sensing of aerosols in the Earth atmos	Yatskiv/Milinevsky													
1.11	Comparative Climatology - Studying Planetary Climat	Ramachandran/Ocampo													09- Status report received
1.13	Planetary Science Enabled by the New Generation of	Baker/Vane/Bousquet													
1.14	Integrated Precursor Distinguish in Multi-Geophysical	Bao Weimin/Contant/Kuznetsov/Zhang													09- Status report received
1.15	International Cooperation on Space Weather	McKenna-Lawlor													
1.16	Expanding Options for Implementing Planetary Protec	Conley/Race													09- Status report received
	Commission 2														
2.12	Effectiveness of different physiological countermeasur	Charles/Kozlovskaya/Norsk													
2.14	Medical Support for an International Human Expeditio	Orlov/TBC/Kussmaul													
2.15	Immersion Model: Importance for Space Life Sciences	Mano/Tomilovskaya													
	Commission 3														
3.14	Public/Private Human Access to Space - Vol. 2 - Earth	Di Pippo/Davidian/Dupas													09- Publication process
3.15	Long Term Space Propellant Depot	Sacccoccia/Lu Yu/Wang Xiaowei													09- Publication process
3.18	Possible International Protocol to handle Crisis/Emerg	Ramakrishnan/Unnikrishnan Nair													09-Final report expected
3.19	Feasibility study of Standardized Career Dose Limits i	Mckenna-Lawlor													
3.21	Space Disposal of Radioactive Waste	Degtyarev													09- Status report received
3.22	Next-Generation Space System Development Basing	Razoumny/Agrawal/Ji Simei													
3.23	Human Space Technology Pilot Projects With Develo	Reibaldi/Zhuang/Unnikrishnan Nair													
3.24	Road to Space Elevator Era	Tsuchida/Raitt/Swan/Takahashi													09- Status report received
3.25	The Maintainability and Supportability of Deep Space	Yang Hong/Zhang Dapeng													
3.26	Space Mineral Resources #2	Dula/Zhang Z./Lenard													09- Status report received
3.27	Towards the utilization of the Moon, Preparing for Mar	Genta/Ventskovsky													09- Status report received
3.28	Strategy of Low Cost and Large Scale Access to Spac	Lu Yu/Reibaldi													
3.29	Strategy and Feasibility Assessment of Collision Prote	Bao Weimin													

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3. IAA Studies

- *IAA studies: general status for your information*

	IAA Study Groups as of September 18, 2017		*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	
SG No	ongoing IAA Studies	Chair/Co-Chair/Secretary	Proposal	Com. ok	SAC ok	Appoint.	1st Draft	Final Draft	Peer Review	Final Report	SAC ok	BOT ok	Edition	Publication	Comments
	Commission 4														
4.8	Space Systems Cross-Compatibility	Esper/D'errico/Herrel/Mendham													09-SAC approval
4.9	International Aerospace System for Monitoring of Glob	Menshikov/Murthi													09-Publication process
4.11	Coordination and Cooperation for Global Environment	Gu Xingfa/Zhou Xiang													09-Publication process
4.16	The Applications of Micro-Satellites and Cube-Sats to	Alkalai/Graziani/Bousquet/Laufer													
4.17	Space Systems for Biomedical Research	Cappelletti/Graziani/Massimiani													09- Status report received
4.18	Definition and Requirements of Small Satellites Seeki	Cho/Graziani/Polansky													09-Publication process
4.19	Promoting Global Space Knowledge & Expertise in De	Horikawa/Coradini													
4.20	Space Information Application in Earthquake Emerger	Bao Weimin/Contant													09- Status report received
4.21	Distributed, Networked, Smart, Cooperating Small Sat	Belokonov/Schilling													09- Status report received
4.22	Through Optimization of Aerospace Trajectories	Teofilatto/Filatyev													09-approval procedure
4.23	Practical Solutions for Post Mission Deorbit for Micro/I	McKnight/Hanada/da Silva													09-approval procedure
	Commission 5														
5.10	Orbital Debris Removal: Policy, Legal, Political and Ec	Hobe/Williamson/Smith LJ													
5.12	Dynamics of Space Exploration Strategies and Future	Ehrenfreund/Plattard/Peter													
5.13	Space Systems as Critical Infrastructure	Piso/Jivanescu/Neagu													
5.15	Space Traffic Management – Towards a Roadmap for	Jorgenson/Schrogl/Robinson/Soucek													09-Publication process
5.16	International Legal and Policy Regimes for Space Nat	Liu Jizhong / Impallomeni													
5.17	Space Debris Situation Report - 2019	Bonnal/McKnight													09-membership TBC
	Commission 6														
6.16	STEM/STEAM for Space - Grand Challenges	Regel/Harris													09- Status report received
6.18	Potential Impact of Quantum Science Satellites on So	Chong YJ													09-membership TBC

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3.1. IAA SG 5.14

- ***IAA Situation Report on Space Debris – 2016***

- **Finished, printed and distributed**
- **Freely downloadable from IAA Space Debris web page**

http://www.iaaweb.org/iaa/Scientific%20Activity/sg514finalreport.pdf

↳ **Will be presented by Darren Sunday 24 September during Academy Day**

See presentation in Appendix 9

↳ *Could be revised for the on-line version*

- **Small modifications not necessitating to go to Review**
- **Update with new MASTER model**

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3.2. IAA SG 5.10

- ***Orbital Debris Removal: Policy, Legal, Political and Economic Considerations***

- **Final draft sent to contributors for final remarks**
- **Sent in parallel to IAA**

The first draft is planned for the Summer 2017 as there are now new perspectives implying short-term binding necessity (only long-term was considered before). This changes the economics and the viability of the proposals and implies cross reference with previous reports. The chapter 4 on Legal issues needs a lot of rewriting. Question on the responsibility for non-maneuverable satellites.

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3.3. IAA SG 4.23

- ***Practical Solutions for Post Mission Deorbit for Micro/Nano/Pico Satellites in Low Earth Orbit***

- Proposers: Darren McKnight, Toshiya Hanada, Alex da Silva Curiel, Rei Kawashima

Overall Goal: Make Recommendations for a Practical Implementation of Space Debris Mitigation Methodologies for Micro/nano/pico Satellites.
（Motivation is to provide factual information to small satellite community including university satellite community. The recommendations will be disseminated through the UNISEC-Global network and other small satellite networks.）

↳ ***See appendix***

Meeting Monday after the A6.1 session
Revised proposal with list of contributors to be distributed

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3.4. IAA SG 5.17

- ***IAA Situation Report on Space Debris - 2019***
- Proposers: Darren McKnight, Christophe Bonnal

Short Description of Scope of Study

Overall Goal:

(Expected scientific or practical benefit of the study group's efforts)

Update of the Space Debris Situation Report – 2016 including new elements, potential improvements and updates.

Following the positive remarks of peer reviewers:

- Improvement of the structure of the document
- Inclusion of data coming from major and minor players (China, India, Ukraine, Korea, …)
- Inclusion of key new topics such as Large Constellations, Nano-Cube sats, improvements of SSA capabilities…
- Update of the figures to cope with latest available ones

Time Line:

(Cannot exceed three years)

First draft by March 2018

Final draft for Peer Reviewing by October 2018

Publication in March 2019

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3.4. IAA SG 5.17

- ***IAA Situation Report on Space Debris – 2019***
- ***Two actions today:***

- Membership
  - Shall include new countries: China, Ukraine, India, Korea
  - Need for a continuity in the initial authors, but
  - Need for new blood also
  - Avoid too many authors as we work by consensus
  - Avoid too many from same countries
  - Agreed so far (random order…): Tanja Masson-Zwaan, Manuel Metz, Mykhailo Kaliapin, Holger Krag, Shen Lin, Moriba Jah, Eric Christiansen, Juan-Carlos Dolado-Perez, Frank Schäfer, Carmen Pardini, Dave Finkleman, Marlon Sorge, Dan Oltrogge, Nicolas Bérend, Samantha Le May, Hae-Dong Kim, Igor Usovik, Zizheng Gong (sorry if I forgot someone…)
- Table of contents
  - Basis is the IAA Report 2016, of course
  - Excellent report ☺, but highly improvable, at the table of contents level and in terms of completeness
  - See list of open actions in Appendix 10
  - Current table of contents and contributors recalled in Appendix 11
  - First draft sent by Darren, to be discussed. Appendix 12