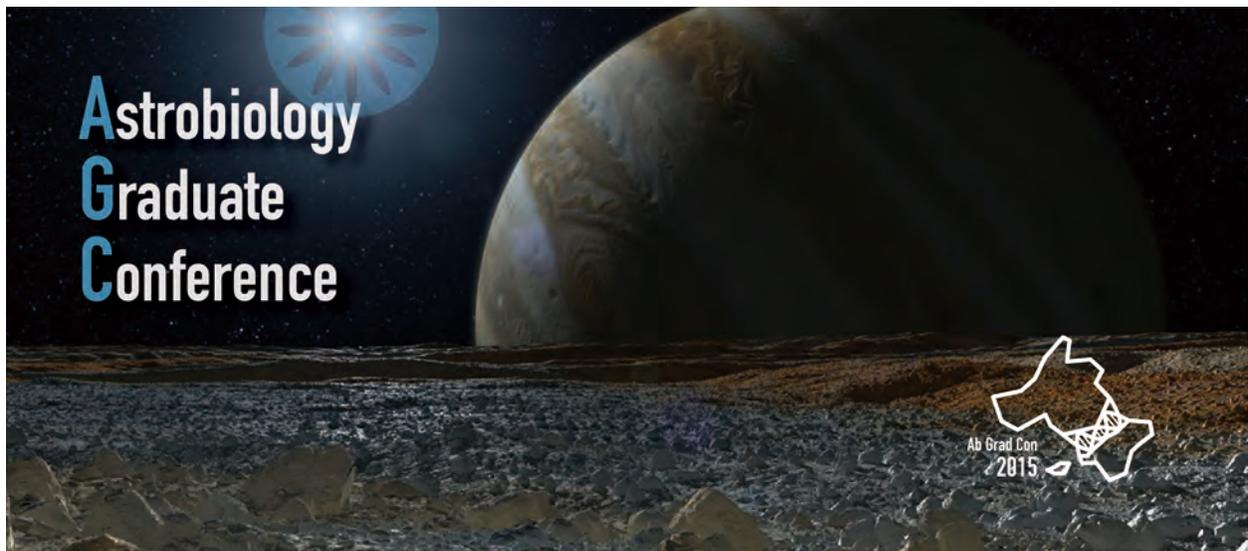


**Report to the  
NASA Astrobiology Institute  
AbGradCon 2015**

**University of Wisconsin - Madison**

**Madison, Wisconsin, United States**

**July 19<sup>th</sup> – 23<sup>rd</sup>, 2015**



## **AbGradCon 2015**

The 12<sup>th</sup> Astrobiology Graduate Conference (AbGradCon) was held at the University of Wisconsin – Madison in Madison, Wisconsin, United States from July 19<sup>th</sup> – 23<sup>rd</sup> 2015. The theme of this year’s conference was “Science Communication On All Levels”. There were 55 registered participants from 27 institutions including two international participants. The conference commenced with an open-house at the UW-Madison Geoscience Department featuring the University of Wisconsin Geology Museum (and one-of-a-kind Biosignatures of Life exhibit!) as well as laboratory facilities. The opening evening included a keynote from UW-Madison Professor John Valley and BBQ-style dinner in the Geoscience Department courtyard. Technical sessions, consisting of 37 oral presentations and 22 posters (including two undergraduate student researchers), were held on Monday and Tuesday. Most oral presentations were streamed live via SAGANet.org. Monday and Tuesday nights focused on Education and Public Outreach activities in the Madison community. On Wednesday, AbGradCon organizers lead a field trip to Devil’s Lake State Park to view and discuss astrobiology connections to sedimentary rocks of Mesoproterozoic, Cambrian, and Ordovician age. AbGradCon 2015 concluded on Wednesday night with a conference banquet and keynote from University of California – Riverside Professor Tim Lyons. The event’s primary sponsor was the NASA Astrobiology Institute (NAI) and our host was the University of Wisconsin – Madison (UW-Madison). Other sponsors included UW-Madison Geoscience Department, UW-Madison College of Letters and Science, and the Wisconsin Institutes for Discovery.



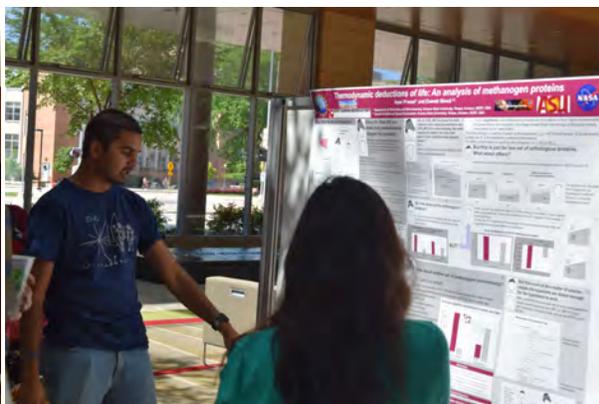
## Detail of Conference Events

### Welcome event and science sessions

Conference attendees who arrived early on Sunday, July 19th were welcomed with guided tours of the University of Wisconsin Geology Museum and Geoscience Department laboratory facilities. The conference officially began with an Opening Keynote titled “Early Earth: When Did It Become Habitable?” presented by UW-Madison Professor John Valley. Following the opening session, an informal welcome event and BBQ dinner was held at the Weeks Hall for Geological Sciences Courtyard. Conference check-in occurred at the welcome event as well as Ogg Hall where participants were housed during the conference.



The technical sessions took place at the Wisconsin Institutes for Discovery Building at the University of Wisconsin - Madison on July 20<sup>th</sup> and 21<sup>th</sup>. Oral presentations were given in the H.F. DeLuca Forum and the poster sessions were held in the Town Center Atrium. The conference welcomed 37 oral presentations and 20 poster presentations. Monday technical session titles included Astrochemistry, Emerging Worlds, Mars, and Planetary Atmospheres. Tuesday technical session titles included Ancient RNA, Early Life, Geochemistry, and Life in Extreme Environments. A warm-up talks were given each morning and following lunches to introduce the disciplines scheduled for the following sessions. Oral presentations were organized to minimize disparity among scientific disciplines by moving from macro-scale to micro-scale, with natural progression throughout the conference in the following general order: Astronomy, Planetary Science, Geology, Geochemistry, Chemistry, and Biology. Lectures were streamed live on the internet via the Social Action for a Grassroots Astrobiology Network (S.A.G.A.N.), and questions were entertained from both conference attendees and internet participants. As in past years, the 2015 AbGradCon oral presentations have been archived on the “NASA Astrobiology” YouTube Channel.



### Science Education and Public Outreach

In the spirit of AbGradCon 2015's theme of "Science Communication on all Levels", a Science Communication and Education and Public Outreach (EPO) Workshop was held on Monday afternoon. The workshop was given by UW-Madison Professor Clark Johnson and University of Wisconsin Geology Museum Assistant Director Brooke Norsted. The workshop was intended to help conference participants enhance their ability to clearly and concisely present science and research in a variety of situations that ranged from formal lectures to friendly conversations and audiences of both specialists and non-specialists. The workshop facilitators provided helpful tips and strategies, outlined EPO philosophies, lead group discussions, and offered an opportunity for Q&A.



Again in 2015, AbGradCon organizers solicited original research abstracts for an "Undergraduate" Research Competition. The undergraduate submissions were also posted in the Wisconsin Institutes for Discovery Town Center Forum and AbGradCon attendees were given the opportunity to fill out critique and feedback sheets for the undergraduate researchers. These feedback forms were also used by the competition judges to assess the quality of the submissions. All feedback forms were provided to the authors for their own benefit. The winning presentation was authored by Brennan Ashwood of Case Western Reserve University and titled "Searching Nucleic Acid Derivatives for their Potential as Extra-Terrestrial Building Blocks: The Case of Sulfur-Substituted DNA and RNA Analogs". Rebecca Martin of Rensselaer Polytechnic Institute was the competition's runner-up. Her research focused on "Polymerization of Activated Inosine Monophosphate Nucleotides Using Montmorillonite Clays".



AbGradCon 2015 organizers emphasized the importance of “communication on all levels” by giving conference attendees several opportunities to practice EPO in addition to research presentations. T-shirts and buttons were made for the conference keeping outreach in mind, proclaiming: “Ask an Astrobiologist About Life Out There!”. Conference participants utilized these T-Shirts and buttons to identify themselves to the public for two organized outreach events: Astrobiology Movie Night and Astrobiology Pub Trivia.

AbGradCon 2015 teamed up with the Wisconsin Union Directorate Film Society’s outdoor screening of the family favorite Disney Pixar’s “Wall-E”. Seizing upon the connection of “lonely rovers”, conference participants engaged with the public in activities and dialogue surrounding the Mars rover, Curiosity. The “Mini Martian” table was a large success with children, who could decorate Curiosity and Maven coloring sheets and send postcards to Curiosity on an iPad via the NASA Mars website. Another station offered learning based activities such as a Venn diagram comparing and contrasting the lonely rovers of Wall-E and Curiosity. An information booth was also set up, where people could come “ask an Astrobiologist about life out there”. The information booth offered free to the public solar system tattoos, space science posters, extremophile trading cards, astrobiology graphic novels, and a curiosity factsheet. We believe that we directly interacted with around 100 members of the community with this outreach event.



Astrobiology pub trivia night was another conference event that was open and advertized to the public. In fact, the event was incorporated into the League Trivia of Madison schedule of eligible contests which further heightened it's profile. The competition was held at a local grill and bar called the "Red Zone". The content of the session was exclusively science-based questions, and the public was again encouraged to "Ask an Astrobiologist about life out there". Conference participants could be identified by their T-shirts and were encouraged to interact with community members. An information station was staffed by AbGradCon members who again offered free solar system tattoos, space science posters, extremophile trading cards, and astrobiology graphic novels. It is estimated that public participation in the trivia night included 40 people.

### **Field Trip**

On the full day of the conference participants were taken to Devil's Lake State Park near Baraboo, Wisconsin. Recent glaciations have led to well exposed geological evidence of the Precambrian earth within this picturesque area. UW-Madison students lead the field trip which included outcrops of the Mesoproterozoic Baraboo Quartzite, the great Precambrian to Cambrian unconformity and folded 1.4 Ga sedimentary rocks. Astrobiological connections in this area include red beds suggesting an oxygenated atmosphere during the Mesoproterozoic and deposition of the Baraboo Quartzite. Conference attendees discussed implications of possible oxygen sinks (e.g. reduced iron) during the Mesoproterozoic and their potential for holding oxygen levels to low levels in Earth's ancient atmosphere. Participants also explored the sedimentary structures which were suggestive of wave-base marine environments during the deposition of the Baraboo Quartzite and debated the oxidation state of the deeper water environments at that time. Opportunity was allotted at the end of the field trip for early career scientists to explore the park's nature center, hiking trails, etc. and enjoy relaxing activities such as swimming in the park's beautiful lake.



### **Closing Evening**

Upon return to Madison, the AbGradCon 2015 Organizing Committee held an organizational meeting for AbGradCon 2016. Approximately 12 regular conference members attended and voiced interest in joining the AbGradCon 2016 Organizing Committee. Suggestions for AbGradCon 2016 host institutions included Arizona State University, University of Colorado Boulder, and joint hosting by Harvard University and Massachusetts Institute of Technology.

The possibility of a joint conference with AbGradE in Athens, Greece was also discussed. The conference closing session began with a banquet dinner at the Wisconsin Institutes for Discovery. Following the dinner, a keynote address was given by University of California – Riverside Professor Timothy Lyons. Dr. Lyons discussed “Sustained Habitability on a Dynamic Early Earth”. The conference and evening ended with a closing comments by AbGradCon organizers.



### **Post-AbGradCon Survey Results, Feedback, and Retrospective**

Attendance at this year’s AbGradCon was slightly lower than previous years. However, this is likely due to the fact that AbSciCon was held approximately one month before AbGradCon. The AbGradCon 2015 Organizing Committee suspects that some presenters decided to only attend one conference and chose the larger meeting.

This year more time was made available to oral presentations by holding poster sessions during the four coffee breaks. This proved to be a very successful strategy. This stimulated conversation during the breaks and allowed the 2-4 presenters at each poster session to maximize their assigned presentation slot. The posters were located outside H.F. Deluca Forum where oral presentations were given so they were also available for viewing before the morning session, after the afternoon session, and during lunch.

Only 2 undergraduate posters were submitted this year compared to 15 undergraduate and high school poster entries at AbGradCon 2012, and 5 at AbGradCon 2013. In the future, organizers will reach out to REU programs and encourage undergraduates to present ongoing work, as

well as suggesting to faculty advisors that presenting would strengthen the final results of the student's REU experience.

A survey was sent out to AbGradCon attendees following their departure from Madison. The full results of the survey are included in Appendix A. The questions can generally be broken down into the following categories: demographics, conference planning, food and accommodations, conference execution, scientific program, and evening events and education/public outreach. Attendance this year included a good mix researchers at different stages of their career and of different graduate educational backgrounds. Conference planning includes topics such as application, registration, and information dissemination and each question received a minimum of 78% positive feedback. Food and accommodations questions also includes ground transportation and each question received a minimum of 81% positive feedback. The conference execution category includes questions about the length and locations of different events and each question received a minimum of 84% positive feedback. Scientific program questions related to time given for presentations, time allowed for questions, poster session details, and warm-up talks. Each scientific program question received a minimum of 81% positive feedback. Evening events and education/public outreach questions received a minimum of 85% positive feedback. Finally, 87% of respondents reported that they plan to apply to AbGradCon 2016.



## Summary and Conclusions

This year's Astrobiology Graduate Conference was another huge success as indicated by the large majority of attendees that plan to apply again next year. The organizing committee believes that the format and timing of this meeting have been nearly perfected over the past decade. The meeting is designed to be packed with activities to facilitate teaching, learning, networking, and general growth in the scientific community. The balance and of these aspects is likely a major contributing factor to the success of this conference. As the field of Astrobiology continues to grow and develop, we hope that AbGradCon continues to be a unique opportunity for early career Astrobiologists to meet, share, and develop ideas that will contribute to the understanding of our universe and the life in it.

**Acknowledgements**

The AbGradCon 2015 Organizing Committee would like to thank everyone who made this year's meeting possible. First and foremost we are very grateful to the NASA Astrobiology Institute for its generous financial and logistical support. We also appreciate our other funding sources including the University of Wisconsin – Madison Geoscience Department and College of Letters and Science. We also thank the Wisconsin Institutes for Discovery for donated meeting and facility space. A special thanks to our invited speakers including John Valley, Clark Johnson, Brooke Norsted, and Timothy Lyons. Administrative support was provided by Judy Gosse and Mary Schumann. Clark Johnson is also greatly appreciated for his role as faculty liaison and offering general planning support.

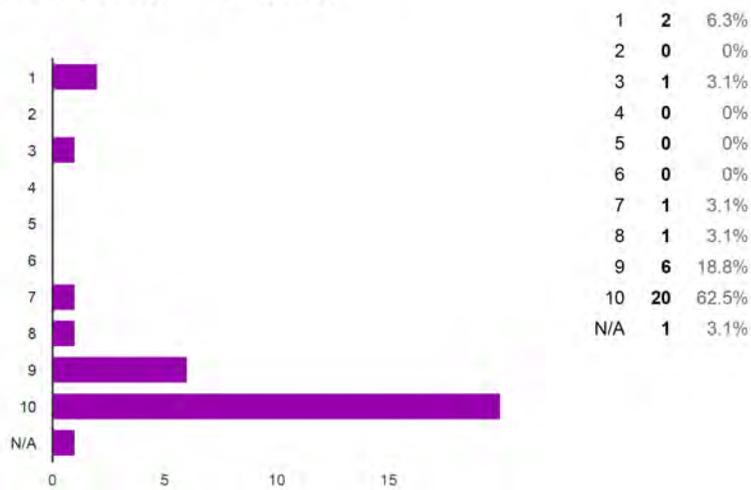
## **Appendix A**

### Survey Results and Feedback

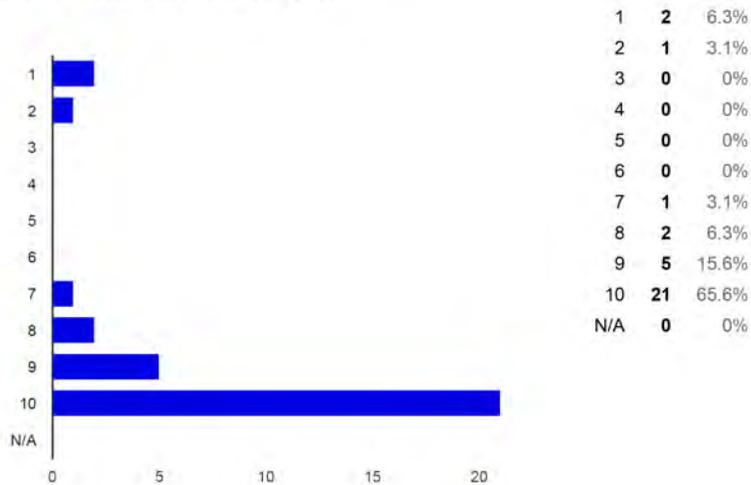
# AbGradCon 2015 Survey Results

## Logistics

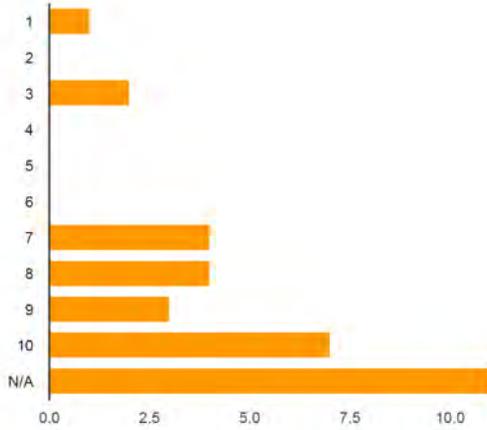
### Application Process [General Logistics]



### Registration Process [General Logistics]

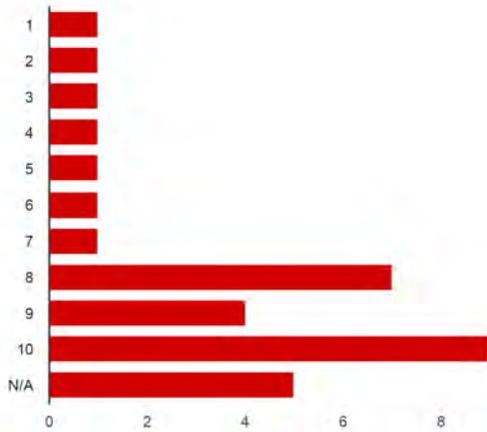


**Airport Shuttles [General Logistics]**



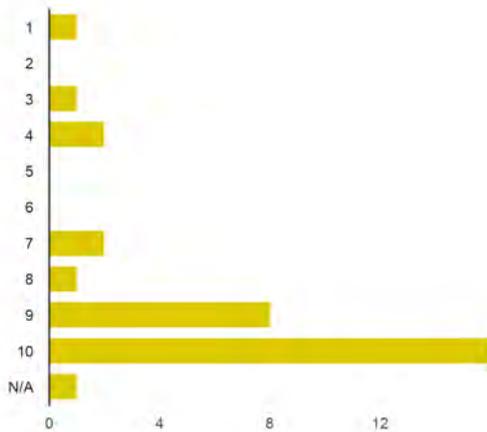
1	1	3.1%
2	0	0%
3	2	6.3%
4	0	0%
5	0	0%
6	0	0%
7	4	12.5%
8	4	12.5%
9	3	9.4%
10	7	21.9%
N/A	11	34.4%

**Lodging in Ogg Hall [General Logistics]**



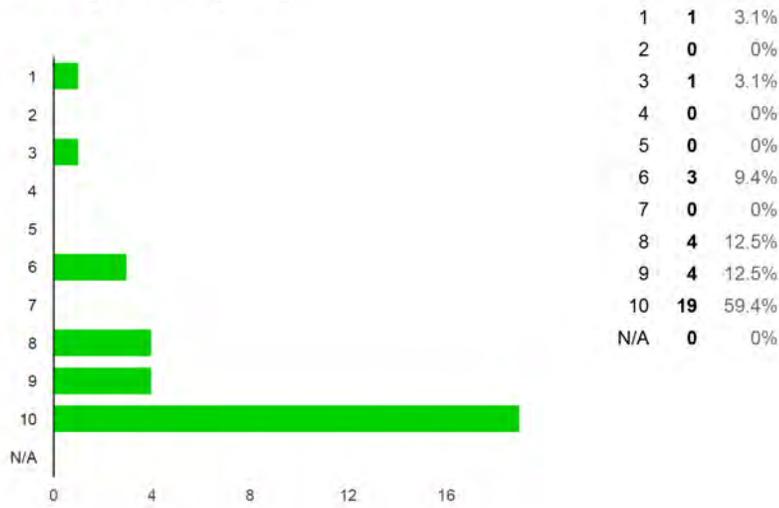
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4	1	3.1%
5	1	3.1%
6	1	3.1%
7	1	3.1%
8	7	21.9%
9	4	12.5%
10	9	28.1%
N/A	5	15.6%

**Meals [General Logistics]**

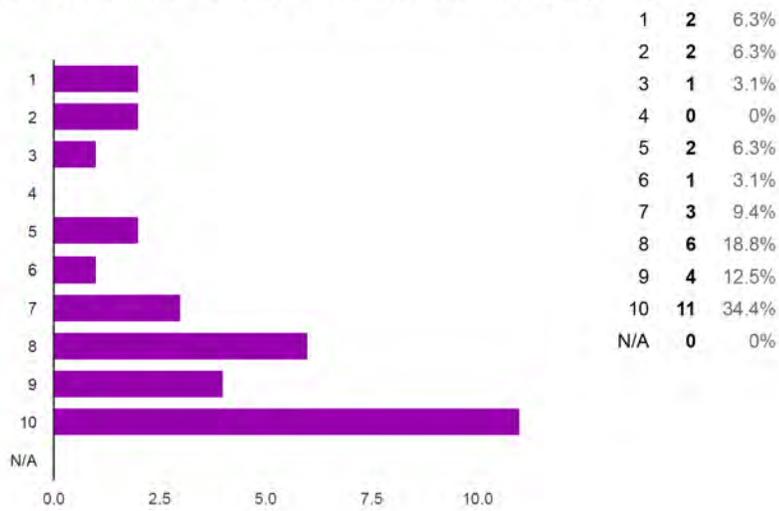


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3	1	3.1%
4	2	6.3%
5	0	0%
6	0	0%
7	2	6.3%
8	1	3.1%
9	8	25%
10	16	50%
N/A	1	3.1%

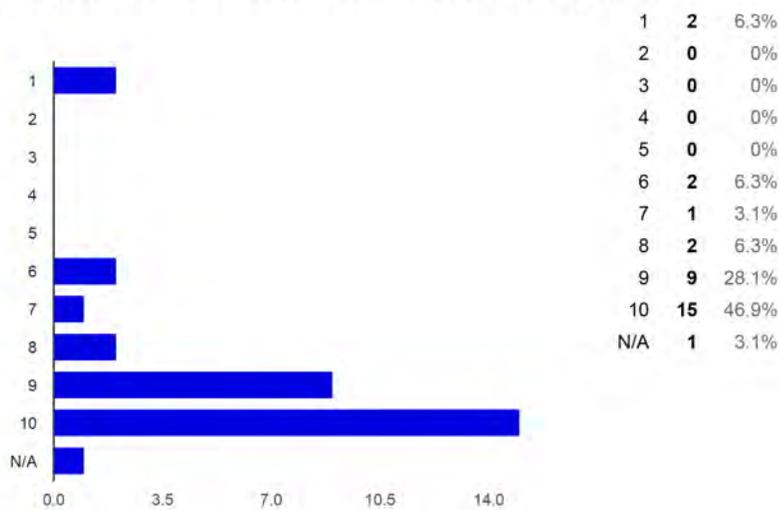
### Coffee Breaks [General Logistics]



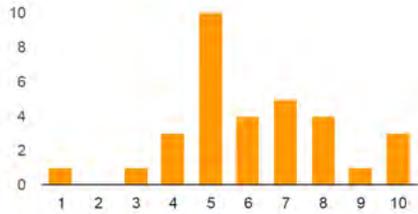
### Information Dissemination Before the Conference [General Logistics]



### Information Dissemination During the Conference [General Logistics]



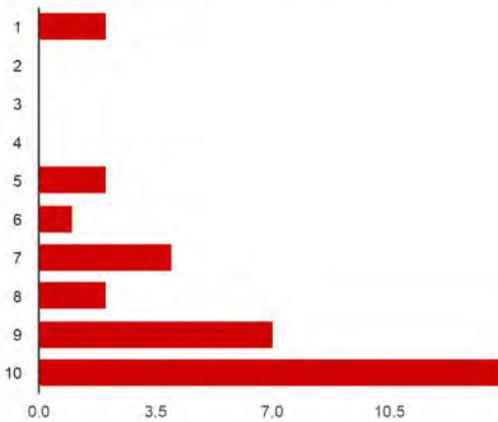
### Travel Funding



Fewer Participants w/ More Funding:	1	1	3.1%
	2	0	0%
	3	1	3.1%
	4	3	9.4%
	5	10	31.3%
	6	4	12.5%
	7	5	15.6%
	8	4	12.5%
	9	1	3.1%
More Participants w/ Less Funding:	10	3	9.4%

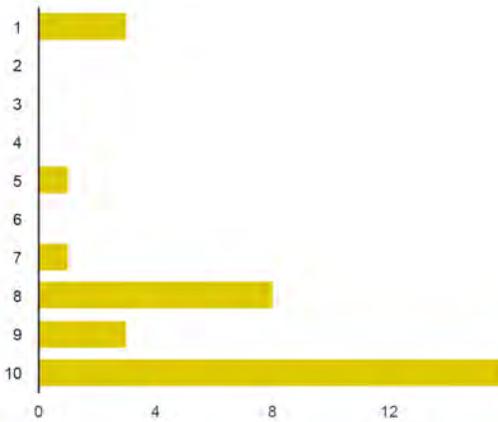
### Scientific Program

#### Set the tone for the session [Warm-up Talks]



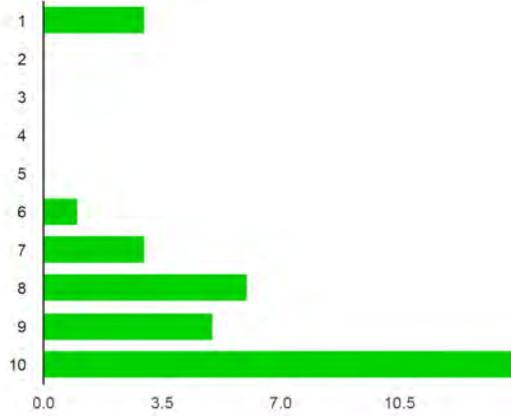
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4	0	0%
5	2	6.3%
6	1	3.1%
7	4	12.5%
8	2	6.3%
9	7	21.9%
10	14	43.8%

#### Were interesting [Warm-up Talks]



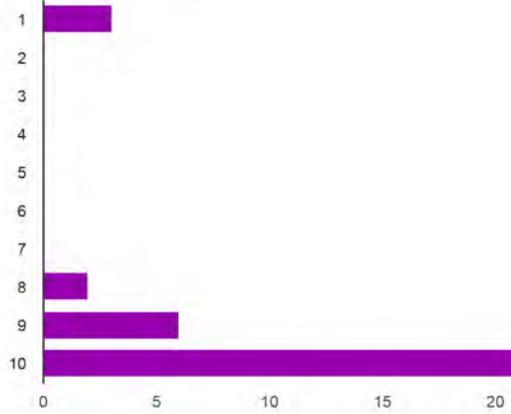
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4	0	0%
5	1	3.1%
6	0	0%
7	1	3.1%
8	8	25%
9	3	9.4%
10	16	50%

**Were beneficial [Warm-up Talks]**



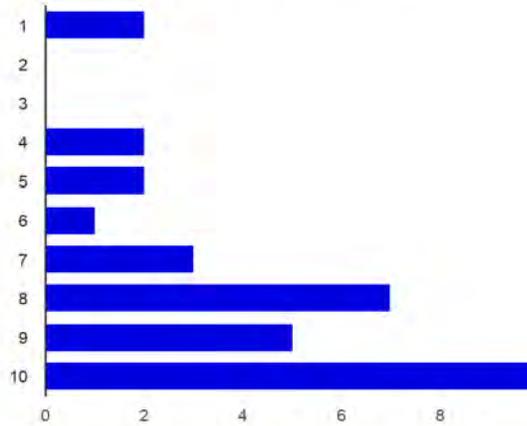
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6	1	3.1%
7	3	9.4%
8	6	18.8%
9	5	15.6%
10	14	43.8%

**Should be a part of AbGradCon 2016 [Warm-up Talks]**



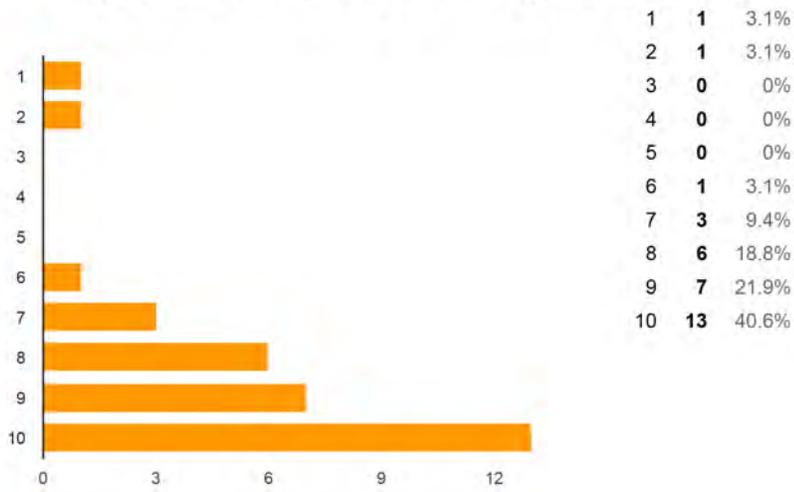
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8	2	6.3%
9	6	18.8%
10	21	65.6%

**Talks were grouped logically by topic [Oral Presentations]**

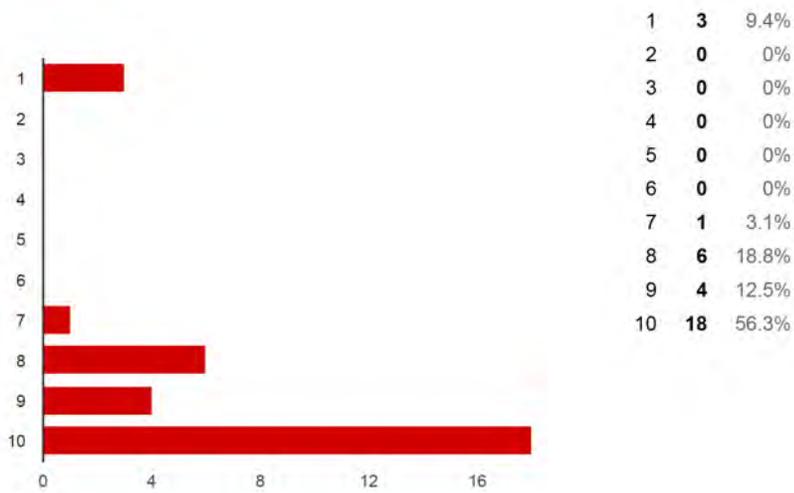


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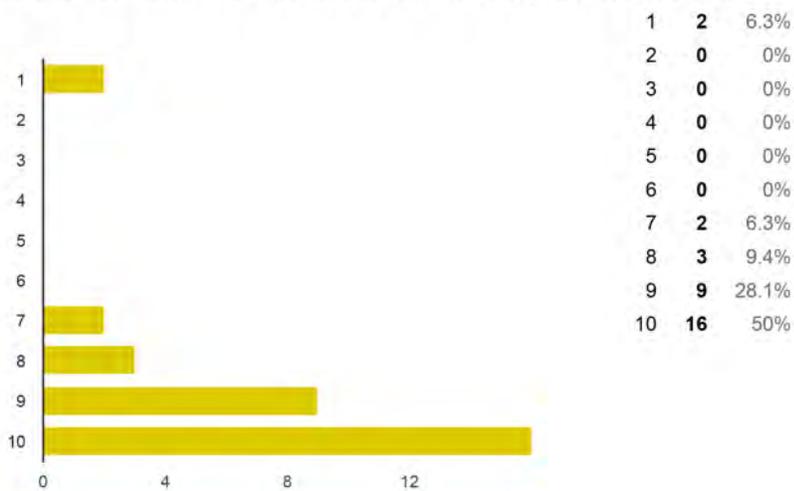
**There were an appropriate number of talks per session [Oral Presentations]**



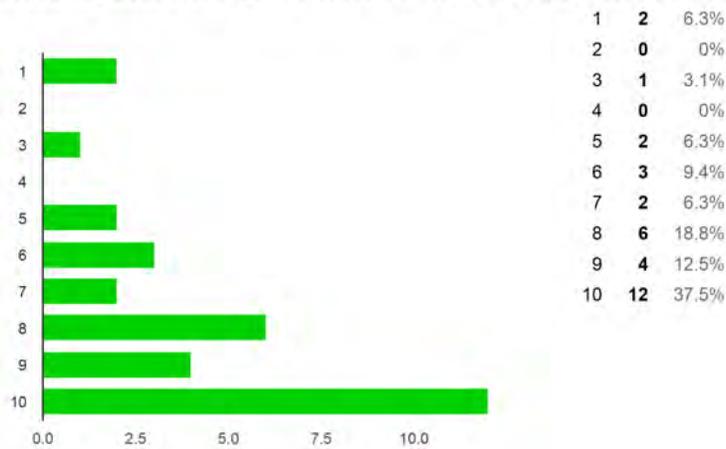
**Talks were of appropriate length [Oral Presentations]**



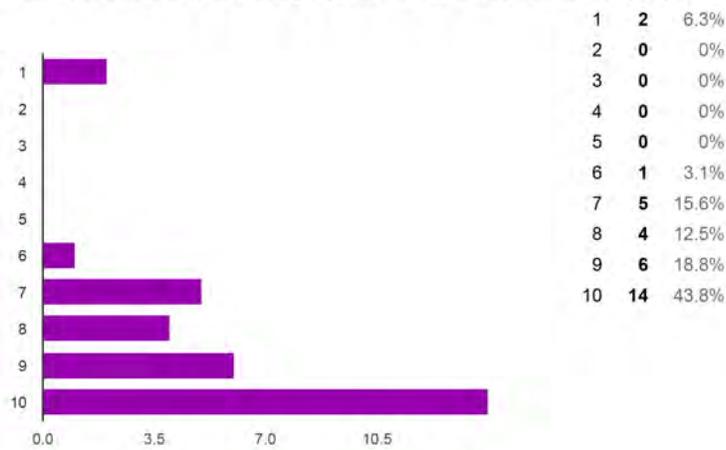
**Sufficient time was allowed for discussion after the talk [Oral Presentations]**



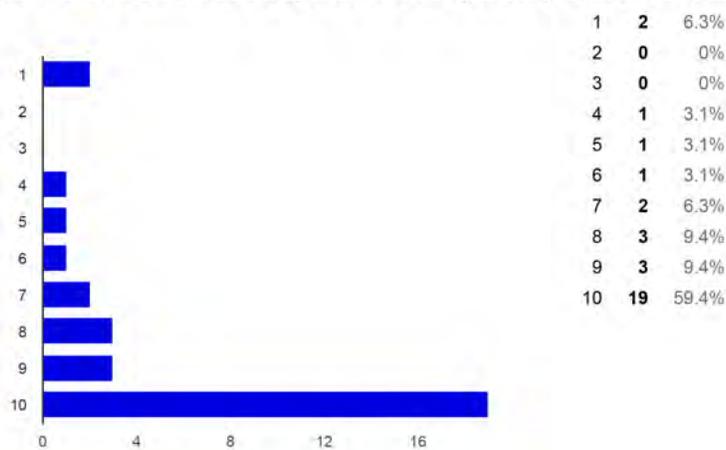
**Time allowed for poster viewing and discussion was appropriate [Poster Presentations]**



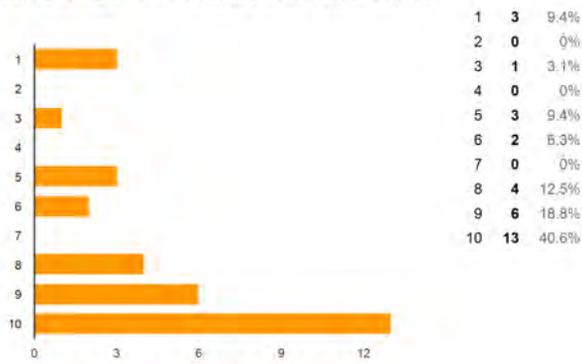
**The number of individuals presenting a poster in each session was appropriate [Poster Presentations]**



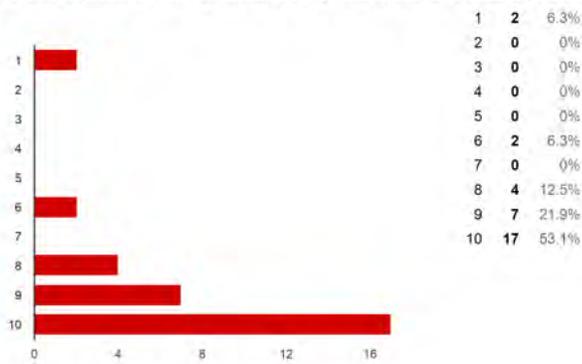
**Sufficient time was available to set up and tear down posters [Poster Presentations]**



**The poster lightning talks were useful [Poster Presentations]**

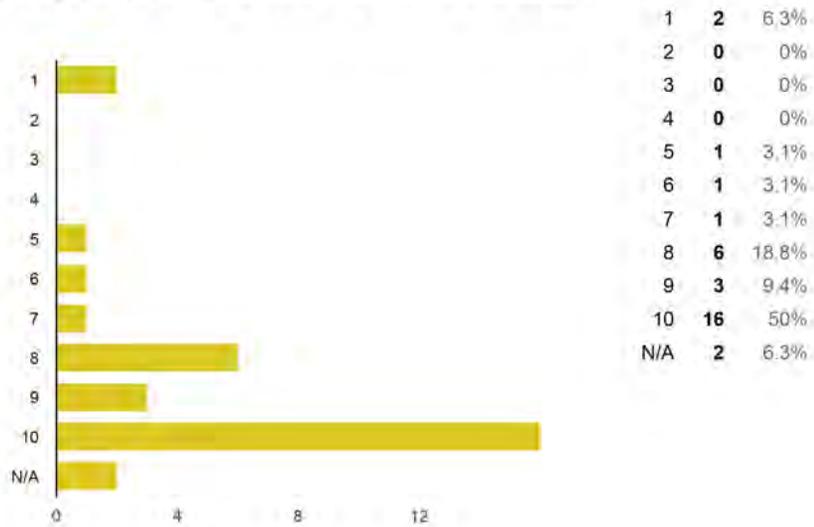


**Overall, the new poster session mechanics were successful, and should be used again [Poster Presentations]**

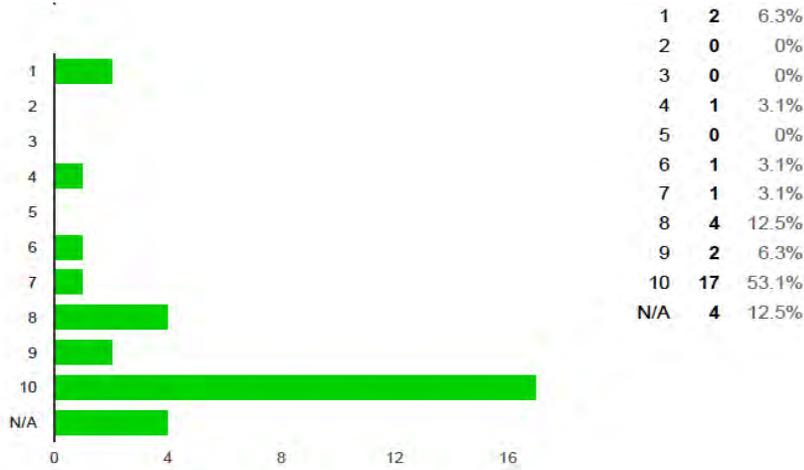


**Information Technology**

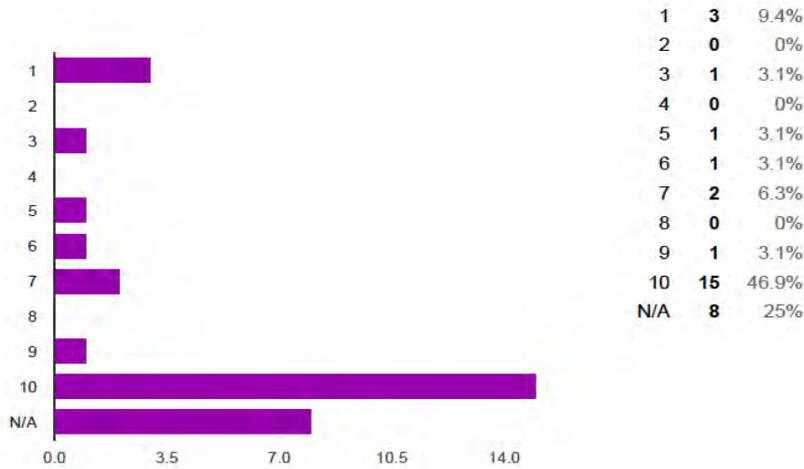
**Printed Program [Schedule, Mobile App, and A/V Interaction]**



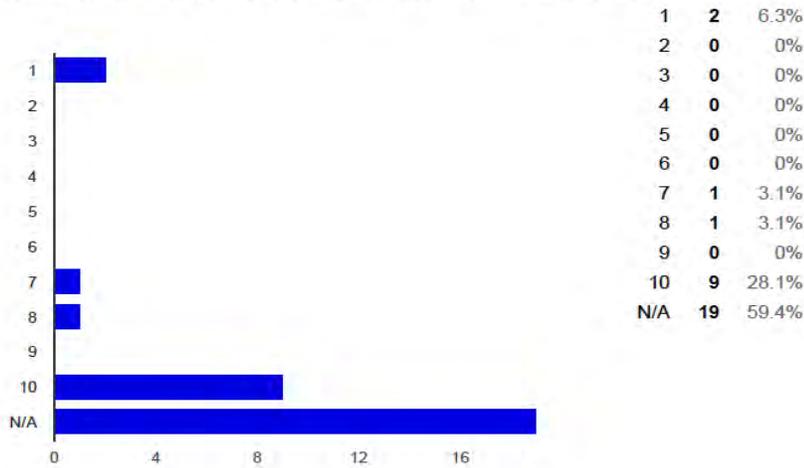
**PDF Program [Schedule, Mobile App, and A/V Interaction]**



**Mobile Application [Schedule, Mobile App, and A/V Interaction]**

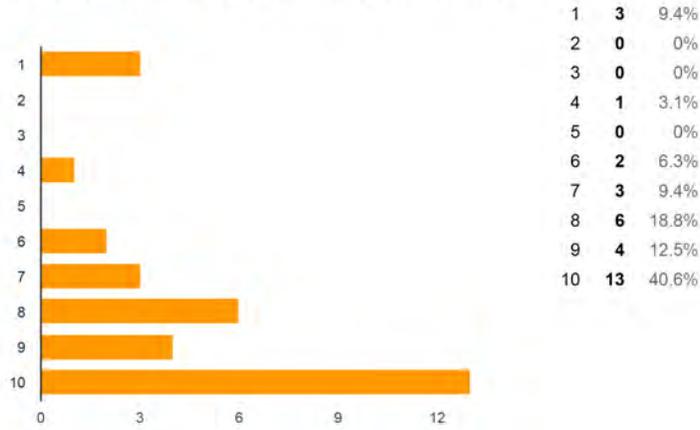


**Webcast Presentations [Schedule, Mobile App, and A/V Interaction]**

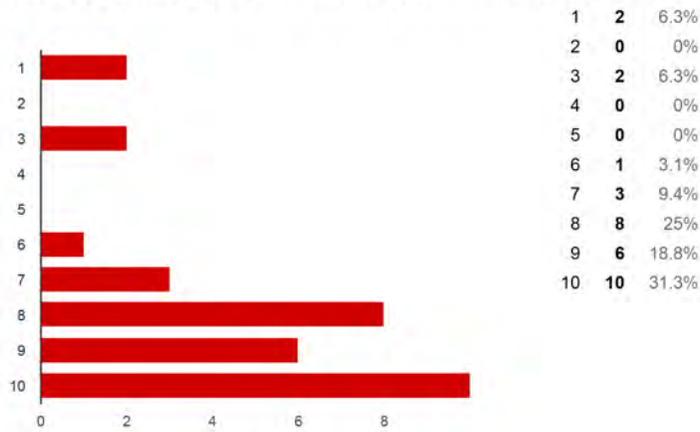


## Special Sessions

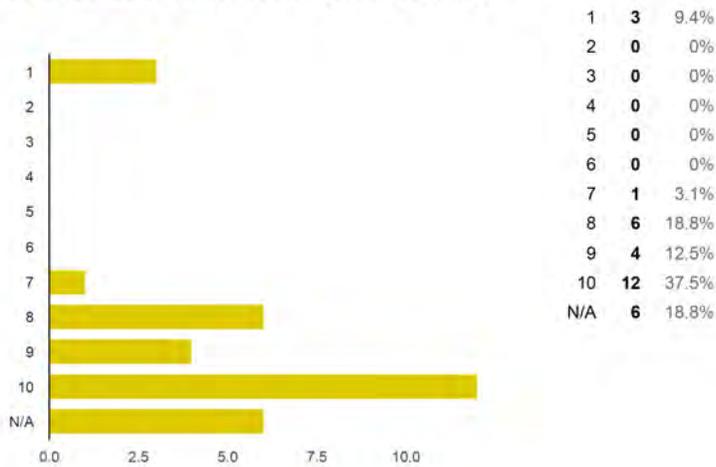
Presentation on Presentations [Usefulness/Successfulness]



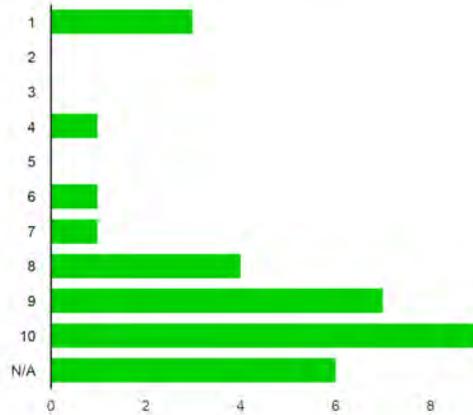
Presentation on Education and Public Outreach [Usefulness/Successfulness]



Public Outreach Table at Union Terrace [Evening Events]

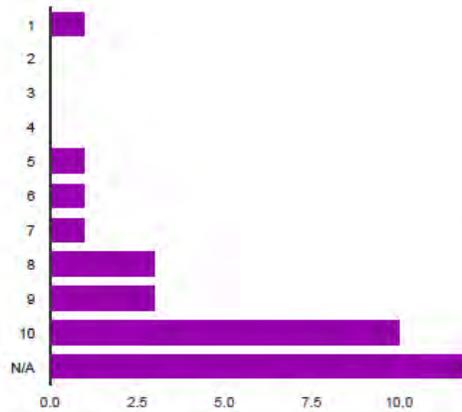


### Wall-E Viewing and Dinner [Evening Events]



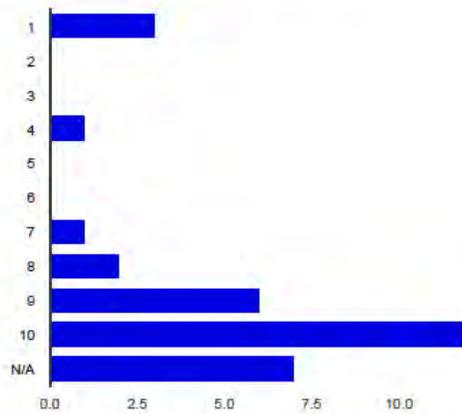
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5	0	0%
6	1	3.1%
7	1	3.1%
8	4	12.5%
9	7	21.9%
10	9	28.1%
N/A	6	18.8%

### Pub Trivia Night [Evening Events]



1	1	3.1%
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4	0	0%
5	1	3.1%
6	1	3.1%
7	1	3.1%
8	3	9.4%
9	3	9.4%
10	10	31.3%
N/A	12	37.5%

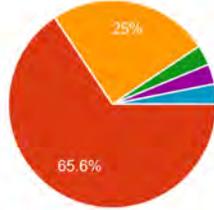
### Board Gaming After Dark [Evening Events]



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5	0	0%
6	0	0%
7	1	3.1%
8	2	6.3%
9	6	18.8%
10	12	37.5%
N/A	7	21.9%

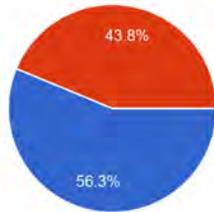
## Demographics

How many years have you attended AbGradCon?



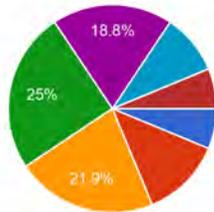
I only attended RFG	0	0%
This was my first AbGradCon	21	65.6%
2	8	25%
3	1	3.1%
4	1	3.1%
5+	1	3.1%
Other	0	0%

I am...



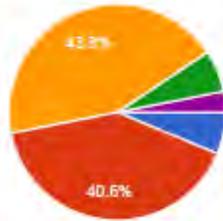
Male	18	56.3%
Female	14	43.8%
Other	0	0%

I am a(n)...



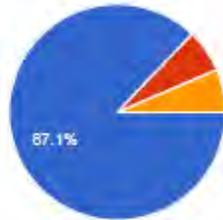
Undergraduate	2	6.3%
Grad Student - 1st Year	4	12.5%
Grad Student - 2nd Year	7	21.9%
Grad Student - 3rd Year	8	25%
Grad Student - 4th Year	6	18.8%
Grad Student - 5+	3	9.4%
Postdoc - 1st Year	0	0%
Postdoc - 2nd Year	0	0%
Postdoc - 3+	2	6.3%
Other	0	0%

**My highest degree awarded is...**



High School Diploma	2	6.3%
BA/BS	13	40.6%
MA/MS	14	43.8%
PhD	2	6.3%
Other	1	3.1%

**I plan to apply to AbGradCon 2016**



Yes	27	87.1%
No	2	6.5%
Other	2	6.5%