

Inclusive Astronomy 2 Participant Selection Procedure

As an inclusivity conference, we understand the importance of transparency as to our method for participant selection for Inclusive Astronomy 2 (IA2). This report, put together by the Organizing Committees of IA2, details how this was done, the options we considered, and the method we ultimately adopted to select people from a pool of pre-registrants. If you have any questions regarding anything in this document, please get in contact at inclusion2@stsci.edu.

Summary

Here we describe the methods of selection employed for the filling the available spaces in IA2 not taken by those asked to give a talk or participate in a panel.

Since this conference aims to discuss the status and path forward for all traditionally marginalized groups in astronomy, the goals of the method were the following:

- Be as equitable as possible
- Ensure that every decision made can be strongly justified
- Critically evaluate whether any of our own biases are informing a decision
- Strive for multiple people of each minoritized identity to attend, to ensure that voices from multiple perspectives within that identity can be heard

We describe here how we chose the selection method we used and what considerations we made. We also briefly discuss the selection of talks/panel members.

Conference limitations: venue size and conference duration

The most significant factor in this selection process, and the reason we had to choose participants at all, was the limited space. Staff at Space Telescope Science Institute have taken the lead in organizing the conference. The venue is the 180-seat Bahcall Auditorium, the largest conference space at STScI and available to the conference at no cost. The venue is well matched to the number of participants in IA1. However, we recognize now that interest in the community has grown significantly.

Unfortunately, alternative or supplementary venues are not available. Additional STScI conference rooms are in a secured area, and spaces at Johns Hopkins are inaccessible to those with physical disabilities and those who use mobility aids. We do not have sufficient logistical resources to support splitting the conference over two venues. Different venues were considered; however, booking fees and the lack of appropriate events infrastructure would have driven costs up and created a substantial financial barrier to participants.

We also considered delaying the conference until the spring or summer. The intention behind scheduling it for October is to provide additional community momentum for addressing inclusivity in the Astro 2020 Decadal Survey. While a larger space that can accommodate everyone is absolutely necessary for further conversations, we did not want to reschedule at the expense of this once-per-decade opportunity. Instead, we hope that the incredible community

enthusiasm for inclusion will support people who want to invest the time and energy to make IA3 happen as soon as possible.

Why Entrofy?

[Entrofy](#) is an optimization tool developed to select participants for meetings and conferences, in an less-biased way than hand-selection, according to a set of user-defined constraints. The decision to use Entrofy as a method of participant selection for IA2 was motivated by its successful application to a number of past astronomy meetings and conferences. The code is flexible and can be used subject to the method chosen by each set of organizers. The number and type of constraints is left to the user, and the target percentages of different constraints is user-defined. For these reasons of flexibility, repeatability and past successful applications, we chose Entrofy for selecting participants for IA2. Links to more information on the code, our application of it, and a sample data set and the code we used for IA2 is provided at the end of this report.

Number of Attendees

The Bahcall Auditorium at STScI holds 180 people. The LOC and SOC together consist of 21 members who would be attending the conference. The 2-day conference duration limited the number of speaking slots, such that the SOC could only chose 21 speakers and panelists. The LOC was tasked with filling the remaining 130 spots; the use of Entrofy to select these participants is described in detail below. Any spots left will offered to Decadal Panelists as decided by the SOC.

Pre-registrant Pool Demographics

A total of 266 participants, not including the organizing committees, pre-registered for the conference. In our pre-registration form, we asked pre-registrants to provide answers (where comfortable) to the following optional questions. The LOC recognizes the sensitivity of asking such questions, and these optional questions were intentionally vague so that this sensitive information was not easily personally identifiable once anonymized. Pre-registrants were informed that the information would be used for participant selection with Entrofy. We will explain how we used the answers to these questions in a later section.

1. Country (and State, if US)
2. Do you self-identify as a person of color or otherwise a racial or ethnic minority?
[Yes/No]
3. Do you self-identify as a gender minority in astronomy? [Yes/No]
4. Do you self-identify as trans and/or nonbinary? [Yes/No]
5. Do you self-identify as a minority with respect to sexual orientation? [Yes/No]
6. Do you self-identify as a minority with respect to disability, Deaf, and/or neurodiverse status? [Yes/No]
7. Do you self-identify as a minority in astronomy with respect to a category we did not list above? If so, please describe here. [No, Other:]

8. What stage are you at in your career, with respect to your highest level of education?
[Early (Student or 0-10 years out)/Middle (10-30 years out)/Senior (30+ years out)]

Selection for talks/panels

There are two main threads to the meeting: developing input for the Decadal survey (day 1); and identifying actions to implement recommendations from the first Inclusive Astronomy conference (day 2). The SOC received and reviewed 90 abstracts for proposed talks. In selecting 21 speakers for individual presentations and panel discussions, the SOC gave preference to abstracts that looked forward with actionable outcomes that will support the community.

Anonymization of data

To protect the privacy of those that pre-registered for the Inclusive Astronomy 2 conference, only one of the LOC members had access to the full responses of pre-registrants. When this person left STScI (and the LOC), their access was revoked, and access was handed to two of the LOC members. This data was then handled with care such that no additional persons would have access to the complete and non-anonymized data set.

Before sharing the data with the rest of the LOC, it was stripped of all information except a numerical ID, answers to the eight questions above, and need for financial support. Only the eight demographic questions were used for anonymized selection via the Entropy software. The financial support information was only retained to keep track of how many pre-registrants would need support and what kind. The need for support was *not* used to make selections.

Selection Criteria

In seeking to make the conference more accessible to early career attendees, we decided upon a sliding scale of registration fee: \$20 for early-career attendees and \$170 for middle- and late-career attendees. Therefore, to balance our budget, no more than 53% of our attendees could be in an early career stage. We recognize that by reducing the fee for early career attendees, we limit the number of early career attendees that we can support. However, we felt that a monetary barrier would make it difficult for the early career attendees to be able to attend at all. This decision informs how we were able to make further selections.

To maximize equitability, the LOC explored two options:

- A) Accept all persons who self-identified as being a member of any of the minority groups identified on the pre-registration form.

- B) Calculate the percentage of pre-registrants who self-identified as being a member of any of the minority groups identified on the pre-registration form (Q2-Q7). Accept, at a minimum, the same percentage of participants as pre-registrants in these groups.

We found that Option A would be impossible to implement given the number of pre-registrants who self-identified as being a member of any of the minority groups identified on the pre-registration form. 170 people identified as having a gender identity that is minoritized in astronomy (Q3), which is, alone, more than the number of people we could admit through the selection process. 155 people answered “yes” to any of Q2, Q4, Q5, and Q6 (not including gender minority). Of these 155 people, 70% identify as being in an early career stage. Due to the limitations previously mentioned on financial support of early-career participants, admitting each of these people would not be possible. However, even if we had opted to use a flat registration fee, choosing these 155 people without considering Q1, Q3, or Q8 would also be arbitrarily exclusive.

To evaluate Option B, we first compared the diversity of the pre-registrant pool to that of the US population. The percentages of minority persons represented in each of the groups that we identified are larger than the reported percentages of these same groups in the US population. That being said, we recognize that several of the identities can be invisible and that the recorded numbers for the US population are not accurate. Therefore, lacking any obvious independent criteria for representation, we determined that the applicant pool itself would be a good indicator of what our target fractions should be. We felt that Option B provided the better opportunity to maximize representation across all of the groups that we identified.

Detailed Entropy Selection Procedure

In this section, we describe every step we took from anonymized demographics to Entropy-selected participants.

1. Go through “other” demographics question and re-categorize if appropriate

Q7 above allowed pre-registrants to add additional ways in which they identify as a minority in the field. We found that five pre-registrants answered this question by self-identifying as one of the minority groups we had already identified, so we used those responses to update the answers to the relevant question(s). There were several other things mentioned by participants, such as first generation American (or immigrant in their country of origin) or first generation college student. Since we did not ask all pre-registrants to address these categories, we did not feel that it would be fair or equitable to use these added categories in the selection criteria. Future conference organizers may wish to include these, and other, additional categories.

2. Remove members of LOC/SOC and consulting members

Our LOC membership changed during the course of our planning, so some people that had applied for the conference ended up later joining the LOC as members or consulting members. We did not include LOC/SOC demographics in our selection criteria, primarily because they would be difficult to truly anonymize, so we didn’t want to require members to disclose. Therefore, LOC/SOC members were removed from the selection list.

3. Remove duplicates

Some pre-registrants sent in multiple applications, either because they applied to give more than one presentation or they edited their response. These duplicates were removed to make sure the demographic fractions were accurate and so that no person would have a higher probability of being selected.

4. Set targets for each demographic question

For a given category, when setting the target fractions (e.g., for “Yes” and “No” answers) in Entrofy, the fractions can be set in two ways:

- fractions add up to 1: We are aiming for these exact proportions.
- fractions add up to <1: The values are the minimum fraction we want for a given category. After the target fraction is reached, the rest are effectively randomly selected, i.e., only the other categories are taken into account.

For questions Q2-Q6, we set the target of Entrofy selected participants within each minority group to be the percentage of pre-registrants that answered “yes” to that question (i.e. 64% of our pre-registrants identified as being a gender minority in astronomy, therefore we aim to have at least 64% of our selected participants identify as being a gender minority in astronomy). We set a target of 0% for any “no” responses to these demographic questions (Q2-Q6). As noted above, once the target is reached by Entrofy, the rest of the attendees are randomly selected, which means that the actual percentage of attendees that answered “yes” to each question will be larger than our target.

For the following questions, we used a different method for setting our targets.

1. Country (and State, if US)
2. What stage are you at in your career, with respect to your highest level of education?
[Early (Student or 0-10 years out)/Middle (10-30 years out)/Senior (30+ years out)]

For location, we grouped the countries into US/Canada, Western Europe, and Other location. We wanted to ensure geographic diversity at the conference given the small number of pre-registrants not located in US/Canada (3.75%). We set a target at 2% for each of Western Europe and Other location, which was to the nearest percent of those pre-registered within each of these categories.

In the case of career stage, we were limited in the number of people we could select from different career stages due to the registration fee differences and our grants to support attendees. We received grant funding from STScI to support 20 early career attendees and funding from AAS for 10 additional early career attendees. Unfortunately, 69% of pre-registrants were from early career stages and we determined that we could, at a maximum (with regards to budget and travel support grants), only support 85 participants in their early career. This comes to 53% of 150 participants (including those allocated talks). We then used the relative percentage of middle and senior career pre-registrants, to adjust the targets for middle and

senior careers groups. This is the only case where we set the targets for more than one answer to the same question.

Note on intersectionality

We recognize that identity is often intersectional and many people hold multiple and overlapping identities from the groups that we identified. We do not explicitly take that into consideration when setting our targets because it involves such small numbers that pre-registrants could become personally identifiable. The existence of multiple minoritized identities results in a higher percentage of persons who identify as a minority as defined by our questions.

5. Run Entropy

We run Entropy through a Jupyter notebook. You can find the notebook that follows the method that we used to select participants from a simulated sample that has similar (though not identical) demographics to our actual sample, on our website at:

<https://outerspace.stsci.edu/display/IA2/Participant+Selection> .

Final Selection

Our final selection for the conference aims to focus on those that are often and traditionally marginalized in the field of astronomy. Due to the subject of the conference, we found that the large majority of people that pre-registered for this conference identify themselves as part of the groups we aim to serve with the conference. We therefore opted to use the demographics of the diverse pre-registrant pool as a starting point in an effort to reduce biases of the LOC in the selection process.

Please see Table 1 for the numbers of pre-registrant demographics and percentages, the targets set in Entropy, and the selected participant demographics numbers. Table 2 shows all of the pre-registrant and selected participant demographics that were not used in selection, but that resulted from the Entropy set limits.

Table 3 gives insight into how intersectionality is represented in our applicant and selected pools. The proportion of people who did not identify as a minority along any of these axes, or did not answer these optional demographic questions was 43 of 266 pre-registrants, ~16%. The number that ended up being selected to participate in the conference as a result of the constraints outlined above was 12 of 152 selected participants, ~8%.

Running Entropy

A Jupyter Notebook of the method used to run Entropy to select participants for IA2 is circulated with this document or available here:

<https://outerspace.stsci.edu/display/IA2/Participant+Selection> . We have created a simulated data with similar demographics to the pre-registrant pool that is also available here:

To install the Entrofy code, head to the GitHub repository:

<https://github.com/dhuppenkothen/entrofy>

You can read more about the Entrofy code in this publication (Huppenkothen et al. 2019):

<https://arxiv.org/pdf/1905.03314.pdf>

Summary of Pre-Registrant and Selected Participant Demographics

Table 1: Categories that did influence selection.

Category	Number of pre-registrants	% of pre-registrants	Target percentage set in Entrofy	Number selected	Percentage of selected
Total	266	--	57%	152	--
POC, or otherwise a racial or ethnic minority	89	33.3%	33.3%	57	37.5%
Gender minority	171	64.0%	64.0%	116	76.3%
Trans and/or nonbinary	20	7.5%	7.5%	13	8.6%
Sexual orientation minority	73	27.3%	27.3%	50	32.9%
Deaf, neurodiverse, and/or person with a disability	44	16.5%	16.5%	31	20.4%
Career stage: early*	166	62.2%	53%	80	52.6%
Career stage: middle + late	79 + 20 = 99	29.6% + 7.5% = 37.1%	38% + 9% = 47%	58 + 14 = 72	38.2% + 9.2% = 47.4%
Location:	4	1.5%	2%	3	2.0%

Western Europe					
Location: outside US/Canada/Western Europe	6	2.25%	2%	4	2.6%

*This cap was set to ensure early-career participants could be financially supported by supplementing their costs with fees from the mid- to late-career participants and from grants received.

Table 2: Other categories that did not influence selection.

Category	Number of pre-registrants	% of pre-registrants	Target percentage set in Entrofy	Number Selected	Percentage of selected
Total	266	--	57%	152	--
Career path: academic	194	73.0%	N/A	109	71.7%
Career path: non-academic	69	25.8%	N/A	41	27.0%
Childcare support	6	2.5%	N/A	3	2.0%
Childcare support (maybe)	9	3.4%	N/A	7	4.6%
Full financial support	45	16.9%	N/A	26	17.1%
Partial financial support	50	18.8%	N/A	28	18.4%
Require accommodations	10	3.8%	N/A	6	3.9%
Location: US/Canada	257	96.25%	N/A	145	95.4%

Table 3: Representation and Intersectionality

Category	Number of	% of pre-	Target	Number	Percentage
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	pre-registrants	registrants	percentage set in Entrofy	Selected	of selected
Did not identify with any minoritized identity (includes not answering demographic questions)	43	16.2%	N/A	12	7.9%
Identified with 1 minoritized identity	106	40.0%	N/A	61	40.1%
Identified with 2+ minoritized identities	117	44.0%	N/A	79	52.0%