

## Recommendations for Moving Toward Inclusive Hiring Practices in Astronomy

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### Statement of problem:

In recent years, we have seen some improvement in representation at the undergraduate and graduate levels in astronomy. At the postdoctoral level, gains have been made, but we have not reached gender parity or societally-proportionate representation of marginalized groups. The composition of university astronomy faculty, however, has barely changed in several decades despite efforts to mend the “leaky pipeline” and scale up recruitment efforts. There are two remaining strong contenders, then, for why this status quo has persisted: climate-driven attrition, and gatekeeping practices that disproportionately hinder the promotion and advancement of astronomers of marginalized identities. Here, we focus on the role of hiring practices, the ways in which they are subject to compounded bias against people in marginalized groups, and mechanisms for mitigating these effects.

### Goals/Requests:

Endorsement of best practices by professional societies. Support for training in inclusive hiring practices, mechanisms for documenting cases of potentially uninclusive practices (field-wide accountability), and incentivization of inclusive hiring practices by funding agencies (e.g., NSF considers makeup of department within which grant application PI resides. If, say, 90+% white male faculty, censure the department by requiring PIs include substantial demonstration of commitment to improve their department via this grant, or, requiring they have a co-PI/directly fund an investigator from a marginalized group.)

Data: we request that hiring data be shared with funding agencies and professional societies so we don't need to draw broad conclusions from other fields' studies. It's clear astronomy has a problem, but we lack the data (other than outcome information) to robustly address it. These data would include demographic information on applicant pools, shortlists, and final hires, as well as the current departmental demographic data.

*This is a working document of recommendations for equity and inclusion in academic hiring, specifically in astronomy, and directed at national funding agencies, search committees, search committee chairs, and department chairs. Its primary focus at the moment is on postdoctoral and faculty positions. I've drawn some references from the Inclusive Astronomy recommendations, but most of the other sources I've found myself or heard referenced in talks, preparation for review panels (e.g., Chandra) or discussion sessions and looked up later. This document will potentially be folded into demographics white paper for Astro2020, and there is currently support for endorsement by the AAS employment committee/AAS broadly.*

*The document is divided into three key parts, plus two afterwords; part one details how to prepare for the search, part two how to evaluate applications once gotten, and part three suggests a post-offer or post-hire regrouping for accountability. The afterwords include suggestions for critically examining the committee's actions and choices, and finally field-wide*

*recommendations for changes to broader culture and hiring practices. --Document drafted by A. Aarnio, UNC-Greensboro, [anaarnio@uncg.edu](mailto:anaarnio@uncg.edu).*

## **I. Before the job is listed**

*Setting priorities and tone in advance, establishing accountability [1]*

- Assess the Department's recent hires (over at least the past 5 hires). Evaluate whether this is in keeping with the goals of the University and/or the Department, and whether the faculty as a whole serve the students well
- Ensure institutional memory can be had from search to search: committees should have access to previous search materials as possible, especially highly relevant individual notes (e.g., if a candidate previously considered was deemed unacceptable due to inappropriate behavior, etc; they could potentially apply again and a new committee would not know)
- Appoint a member of the committee as inclusion representative to serve as a liaison with University offices for equity and inclusion
- Commit to this accountability for every search: keep in contact with the office for equity and inclusion/Dean's office for accountability throughout the hiring process and touch base again when the applications are all in, at each narrowing point of candidate lists<sup>1</sup>, and after the process is over and a hire has been made.

*The composition of the hiring committee*

One might reasonably conclude, and it is often said anecdotally, that diverse hiring committees produce diverse results. This could either be directly due to the composition of the committee, or because the composition of the committee is revelatory of the priorities of the department [3]. But,

- Tokenism must be considered: research has shown that if membership on a committee consists of <10% of a given identity group, the member will behave as if a part of the majority group [ ]; between 10-30% membership, their presence will have an impact but it could but they will incur negative consequences [ ]. Nearing 30% membership, there could be significant backlash (i.e., their identity group will be judged even more harshly than at lower committee representation levels) [ ], and beyond 30% the consequences diminish.
- Research in academic searches specifically is rather sparse and inconclusive on the effects of the fraction of women/URM on committees, and is often highly specific to a particular promotion level:
  - In some cases, a single woman on the review panel improves outcomes for women [2,3];

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<sup>1</sup> If not already codified in institutional faculty hiring processes, allow for candidate-pool narrowing done by committee to be revoked by institutional leadership. At Johns Hopkins, e.g., if demographics skew from broader pool to underrepresentative from list to list, departments must justify choices that led to that [27].

- For the specific case of promotion from associate to full professor, it has been found that every additional woman on a seven-person panel further increases odds of a woman's promotion success by 14%; for promotions to associate professor, it was found the gender distribution of the panel had no effect, save that once the panel reaches majority women evaluators, it actually decreases odds of success for female applicants [2]
- In analyzing just two HST cycles and breaking down the review panels by gender, it was found the number of women on the panel didn't affect the percentage of successful proposals by female PIs. Combining all reviewers for every cycle, not considering panel-by-panel to correct for the fraction of submitted proposals per panel, upholds the conclusion that the fraction of female reviewers doesn't impact the fraction of successful proposals submitted by women [4]
- *Chandra* TACs have always strived to have at least one, if not two, women on a panel. Their success rates have been indistinguishable since cycle 10 (*Chandra* is currently on cycle 18), and they have no data on selection rates as a function of panel composition (source: direct communication with Andrea Prestwich).
- Establish a graduate student interview committee, and value their input on candidates. Involve the graduate student committee in discussions shaping the rubric, in moving from longlist to shortlist, and creating the final candidate ranked offer list. Recognize their valuable contribution to the department in this position either with an honorarium or departmental recognition of appreciation for their work

#### *The advertisement*

- Involve institutional offices for equity and inclusion in the crafting of the advertisement
- Include language encouraging applicants from underrepresented groups: include race, gender identity, sexual orientation, disability status. This is an important first look at the department's climate: an unwelcoming advertisement could discourage potential hires from applying in the first place [3].
  - great example: Carolyn Brinkworth's recent ad includes:
 

*"The desired experience and skills are listed in the position description ... but we note that research shows that women, in particular, feel that they need to meet all job requirements to be considered, and we would like to remind you that this is not the case. If you have the passion for the work, and have some experience in working with others in equity and inclusion, whether it's in a professional or personal role, we encourage you to apply. We can provide on-the-job support and training for the rest."*
- Run ad through word choice checker to be sure gendered words aren't being used
- Circulate ad far and wide: some departments maintain lists of contacts at underserved institutions and ensure a copy is sent there. If not already required as part of the search process, providing this list of institutions to the Dean's office would be helpful: multiple departments' lists could be aggregated to expand the reach of searches across departments

- Men have been found to have an “information advantage” in knowing positions exist in the first place; efforts must be taken to balance this [3]
- Consider not listing specific skills required, and defer to general language instead (e.g., a positive job ad example from Amazon/AWS: “Experience with a programming language (Python, C++), data modeling, and common database query syntax”)
- While general searches will produce the broadest applicant pool, if the job is narrowly focused, be up-front about make-or-break selection criteria (e.g., if applicants must currently be funded and have 2 years of already-gotten funding, it would save a lot of people a lot of time applying to know that)

#### *Establishing a rubric in advance*

- A rubric should be ready before the first application comes in and uniformly applied to all applications by all members of the committee. The rubric should be carefully designed in order to effectively capture the values of the department; full-departmental discussion in its development would be useful
- Every candidate should be required to submit the same documents
- Require an inclusion statement and use it in ranking of candidates: applicants who are able to speak to their work done promoting equity and inclusion in Astronomy are likely to be motivated due to their own lived experiences. Directly place value on these lived experiences.

## **II. Evaluation of applicants**

Below, we outline overarching themes of how search committees and voting bodies can mitigate unconscious bias, recognize compounded systemic biases that serve as losses of opportunity, and promote/incentivize a cultural shift towards valuing uncompensated work of moving our community to being more equitable and inclusive. Before the interview process begins, ask University officials, likely HR, who collected applicant demographic data whether the initial applicant pool, longlist, and shortlist were consistent in representation across assessment phases. Consider asking representatives external to the department to be present during faculty discussions of candidates to point out problematic language or framing. Departmental discussions of candidates should be led by a presentation/reminder of the evaluation rubric and how the search committee has translated departmental values into ranking criteria.

#### *Unconscious bias*

- On the part of committee members themselves
  - Have everyone begin by taking the implicit bias test [4] to remind all that it's there; discussing bias before reviewing, making reviewers aware, has been seen to affect outcomes [5,6]
  - Age groups from 40-65 found to have strongest implicit bias [7]; tend to make up bulk of evaluating committees -- make committee members' age/career status diverse, while considering power dynamics (i.e., avoid having a lone early-career representative who may feel constrained in voicing thoughts)

- Research has shown women are more likely to take the findings of studies of bias in academic contexts more seriously than men [8]
- As manifest in recommendation letters
  - Gendered bias: it's becoming more well-known that letters of recommendation written for women tend to be shorter, less strongly endorsing, invoke gendered language, and are more likely to discuss the applicant's personal life [9]
  - Regional bias: "it's amazing to find such a qualified scientist from the South!"
  - Racial bias: microaggressive phrasing, e.g., "he's so eloquent."
- Having a rubric in place removes the ability for committee members to use potentially personally-biased statements such as, "I *feel* this applicant is the best.."
- While it is recommended that the search committee receive bias training, entire faculty will end up voting on candidates and ranked order of short/offer lists. Do not allow voting if their university-mandated anti-bias training is 3 years or more out of date.
- Position-specific gender antipathy: a study of promotions in Europe to associate professor and to full professor found little gender bias at the lower level promotion reviews, but more at the higher, suggesting the amount of bias is related to the level of position being applied for [2]

#### *Systemic factors*

- Take great care with using metrics that have been shown to be affected by bias (e.g., the h-index [10], student evaluations [11], publication rates [12,13]).
- Remember that uncompensated work is done by candidates from underrepresented groups that only directly manifests on a CV in the sense that it takes away time from working toward accomplishments heavily weighted in evaluation (e.g., publication rates)
- Bear in mind that bias begins at the student level and can result in accumulated lost opportunity over a candidate's career path, as well as inflate attrition overall:
  - Male professors shown to be less likely to work with female students [14,15]
  - Proposal bias favors male PIs to female [16,17]
  - Funding more often granted to male than female PIs [18] at rates estimated up to 7% [19]
  - Be keenly aware that members of underrepresented groups are likely to skew to earlier-career statuses and thus may be demoted in rankings due to having "less experience." At increasingly senior career levels, there are simply fewer astronomers from marginalized groups: adjust expectations accordingly and actively compensate as an investment in the future of the field
- Studies have found that women are less likely to self-cite than men [20]
- Applicants from underrepresented groups need to have more publications and qualifications to be considered as competent as those not from underrepresented groups [21,22]

#### *The composition of the applicant pool and short list*

- Critical mass: the *Chandra* X-ray center team has tracked proposal PI gender and noted once the fraction of women PIs submitting proposals reached 25%, the likelihood of proposal success reached the fraction of applicants [4]

- If only one member of an underrepresented group is in the pool, the statistical likelihood they will be hired is ~0% [23]
- If there are no applicants from underrepresented groups present in the final selection pool, for accountability, the hiring committee should be able to explain to the equity office why this is the case [1] (e.g., search and recruiting efforts failed, the scientists who did apply failed to meet a basic criterion in the rubric, etc)

#### *In-person or phone interviews*

- Interviews by phone or internet meeting services are often employed in narrowing from a medium to a short list. To provide no subjective advantages, questions should be set beforehand and asked uniformly of all applicants
- Provide a schedule and list of resources in advance, perhaps as part of a welcome packet, to every candidate invited to interview to increase their comfort level and odds for success. These resources could include locations of gender-neutral restrooms, mother's rooms, contact information for institutional disability and accessibility services. Provision of this information up-front relieves applicants of the onus of having to ask/disclose

### **III. After the hire is made**

Convene post-process to debrief, review what was effective and what was not, and save a summary for the next committee's use. Check back in with the institutional equity office or whichever particular administrative body was initially consulted pre-search to ensure accountability [1].

If HR practices disallow or disincentivize formal notification for applicants who were not selected, informal messages are an option and much appreciated. Clearly the present market is saturated with applicants, but it still takes time and effort on their part to apply and informal notification is the minimal professional courtesy that could be extended.

### **IV. Suggestions for avoiding the pitfalls**

- Anonymized evaluation: give committee CVs/cover letters/research statements for initial ranking with applicant names removed (can be added later as needed)
- Make an initial ranking pass on the applicant pool using only inclusion statements and CVs
- Use letters of recommendation as second or third stage information (once initial anonymized assessment is complete) and if possible, run recommendation letters through online tools [24] to detect words that are gender-coded before the committee evaluates them; remove, highlight, or replace them with neutral synonyms
- Prepare final questions to keep in mind to minimize influence of bias and societally-driven assumptions (directly reproduced from the University of Oregon faculty hiring implicit bias guide [25]):

*“Determine whether qualified women and underrepresented minorities are included in your pool at rates expected based on availability, and consider whether evaluation biases and assumptions are influencing your decisions by asking yourself the following questions:*

- *Are women and minority candidates subject to different expectations in areas such as numbers of publications, name recognition, or personal acquaintance with a committee member?*
- *Have the accomplishments, ideas, and findings of women or minority candidates been undervalued or unfairly attributed to a research director or collaborators despite contrary evidence in publications or letters of reference?*
- *Is the ability of women or minorities to run a research group, raise funds, and supervise students and staff of different gender or ethnicity being underestimated?*
- *Are assumptions about possible family responsibilities and their effect on a candidate's career path negatively influencing evaluation of a candidate's merit, despite evidence of productivity?*
- *Are negative assumptions about whether women or minority candidates will "fit in" the existing environment influencing evaluation?"*

## **V. Field-wide recommendations**

- Advertisements that explicitly say what the department is looking for. E.g., if you want a cosmologist/extragalactic theorist/observer, please save the stellar people the time of applying.
- A common application
- Timely notification systems:
  - the new AAS job register allows for editing of position status by the employer. This should be used, and preferred over informal, anonymous reporting of information
  - Candidates who interview, by phone and/or in person, and are not selected should be at least informally notified by the search committee. Departments who ghost candidates should be aware of the highly negative reputation this practice establishes for them in the community
- Openly published short lists for transparency and institutional accountability in the broader community
- Attention to/effort invested in making departments inclusive spaces that will attract and retain applicants of all identities [26]. While these recommendations address the hiring part of the problem, the department itself must recognize the work needed in order to establish an inclusive culture that is welcoming to the diverse groups being recruited
- That committees keep in mind the cumulative effects of biases on marginalized applicants: loss of opportunities to get data (proposal evaluation bias), loss of opportunities in getting high name-recognition jobs/fellowships, potentially inadequate mentoring, bias against funding applications
- Feedback for applicants. What if a particular recommender is not writing good letters? Or they didn't get in on time/at all?
- If no underrepresented and/or marginalized applicants in initial pool, search should be considered a failure. If none in medium-list, separate applications and reassess with the previous N pages in mind

- Direct acknowledgment of issues within a given department: candidates who see departmental faculty listings can be discouraged from applying in the first place. This could be acknowledged in the job ad itself, in tandem with requesting inclusion statements
- Cluster hires [28, 29, 30] to establish cohorts, eliminate isolation, and strenuously avoid tokenization.

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