Recommendations for a Faculty Search that Prioritizes Excellence and Diversity In MSU College of Natural Sciences

1. Remind yourself that in a standard MSU faculty appointment, the job is only 50% research, and we should be hiring based on qualifications for 100% of the job. A healthy community is composed of faculty who are good departmental citizens and who care about their students, in addition to doing excellent research. Faculty candidates really do exist who are excellent at research, teaching, *and* service to their communities[1]. Therefore, we should create a process that selects for them, rather than settling for someone who is good in only a subset of their job duties. Taking teaching and service seriously is also the best way to ensure that the new faculty hire will fight to further the cause of diversity, equity, and inclusion in our community. **Seek to design your search to find candidates who excel at all three aspects of the job.** Again: this does *not* mean compromising on research excellence; it just means some additional considerations for your search (see below).

2. Work to keep the position's research field as broad and general as possible. This is important for three reasons: First, candidates who excel at research, teaching, *and* service do exist, but they are not as common, and not always immediately recognizable. We want to maintain a large pool of applicants to make sure that it includes some folks who fit this bill. Second of all, a job description that is narrowly prescribed is more likely to alienate potential candidates from under-represented groups. Women and underrepresented minorities are unlikely to apply for a job unless they believe they meet 100% of the criteria. Third, implicit bias is at its strongest when there is only one candidate from a stereotyped/under-represented class in the pool of applicants (e.g., Heilman, M.E. 1980, *Organizational Behavior and Human Performance*, 26, 386). By broadening the search and growing the pool of applicants, we grow the number of women and candidates of color, and thereby diminish the search committee's implicit bias.

3. Scour the web for potential candidates, and contact them individually to ask them to apply to your position. We spent several person-days poring over websites of departments with substantial postdoc populations and lists of recent fellowship winners, particularly paying attention to fellowships that support scientists from under-represented backgrounds. We further investigated these researchers by checking their publication records and personal websites. We created a list of candidates who had active, productive research programs and seemed to be in a career stage where they would be interested in applying, and wrote each person independently to invite them to apply.

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[1] While not everyone will have had the chance to teach a class as a graduate student or postdoc, applicants who care deeply about students will find a way to interact with and support them—for example, as a research mentor or via outreach to K–12 classrooms. The same is true for department service and leadership; many applicants have been deeply involved in making their departments or fields better places, even if they did it from a relatively junior position. If an applicant has not participated in such initiatives, that was their choice, and that choice holds information.

This was a lot of work, but it paid off. 11 out of the 16 candidates on our longlist were invited to apply, and 8 of them self-reported that they probably wouldn't have applied if we hadn't reached out. I have heard wonderment at this number: why would a candidate not apply, if they are ready for the job market and are a fit to the job description? In many cases, the answer is that under-represented folks face higher barriers in convincing themselves that they are ready to apply for high-status jobs, and in convincing themselves that any particular job is a good fit. Additionally, we invited a number of less-traditional but very promising candidates (e.g., scientists who had extended-term positions at labs/observatories, scientists who had been on "soft money" for a number of years), who hadn't been thinking about applying for faculty jobs in that particular year. I believe that if you take the time to compile a list of promising, diverse junior researchers in your field, you will find that the effort was truly worthwhile.

4. Be specific in your requests for job application materials. I've often received applications that had minimal mention of student mentoring, service to the professional community, or public outreach, and was left wondering if the candidate had no record in these aspects of the job, or if they thought the committee would have no interest in them. This ambiguity can easily be avoided by specifically stating what you would like to see in the CV (we requested "a CV, including a list of publications, accepted proposals for funding/resources, contributed and invited talks, teaching and mentoring roles, leadership positions, contributions to the academic community, and efforts in public outreach"). Similarly, although it is becoming increasingly popular to request diversity statements, the definition of a diversity statement remains murky, which can lead to both applicants and committees taking it less seriously. Instead, we requested:

> a 1–2 page statement of contributions to the academic community. Faculty assume diverse responsibilities, including fostering student learning, advancing research, disseminating knowledge, and sustaining healthy inclusive communities. The applicant should describe how they have "given back" to their previous institutions and communities, and their interests and plans for enriching the MSU community.

In the job ad, specifically explain what the application materials should look like, and make sure the requested materials allow you to evaluate all three aspects of the job (see Appendix A for an example from our search).

5. Consider strategies for assessing applicants' communication skills. Many searches carry out phone/zoom interviews before converging on a shortlist, but this can come with its own biases. For example, a colleague alerted us to how it might negatively affect candidates with speech disorders, and we decided against them for our own search. Instead, we decided to request each long-listed candidate recommend a lead-author paper for the committee to read. This paper formed part of our assessment of their scientific communication skills. We also found this to be quite informative at addressing the candidate's creativity and ability to ask important questions. We recommend this highly as a strategy.

6. Avoid reading recommendation letters for as long as possible. Recommendation letters are fundamentally subjective and well-known to be biased against applicants from under-represented/stereotyped groups (e.g., Madera, J.M., et al. 2019, *Journal of Business and Psychology*, 34, 287). We recognize that they are nevertheless important in some fields (i.e., dominated by large collaborations), but strongly recommend that the committee avoids reading them in the first round of candidate selection. In our search, we only requested letters after the longlist of 16 candidates was made—and found them to be of essentially no use when we did.

7. Carefully design your rubric, and include a pre-specified weight for each element. Decide on objective triage criteria (Appendix B), describing how you will know if a candidate meets the qualifications for the job, so that—after this triage stage—you will not have to spend effort (and risk of bias) wondering if e.g., a candidate does the "right" sort of research for the job.

Create another rubric for candidates who pass triage (Appendix C), and consider how you will measure each rubric element. Be particularly wary of elements that stress “potential” (i.e., “potential of future research plans”, “potential to strengthen our program”). It is nearly impossible to predict the future, and assessing a candidate based on past achievements rather than future projections is much more evidence-based and less subject to implicit bias. For our search, we had as a rubric element "potential for obtaining external research funding", but formulated how we would judge this criterion based on past work (e.g., accepted proposals, strength of the research statement and lead-author paper).

Consciously assign a weight to each rubric element. Note that, if there are six rubric elements about research, one about teaching, and one about service, and all elements by default receive the same weighting, that implies that research is five times more important than either of the other elements. Check that this weighting is consistent with what you value in a colleague.

Appendix A: Job Ad

The Department of Physics and Astronomy at Michigan State University (MSU) invites applications for a tenure-system faculty position in astronomy. The search is open to all fields of observational, data-intensive, or survey astronomy. The successful candidate will have demonstrated the ability to carry out forefront research and a commitment to building an equitable and diverse scholarly environment. While we expect the appointment to be at the assistant professor level, depending on the experience of the candidate, an appointment at the level of associate or full professor will be considered.

MSU has strong astrophysics research programs in compact objects, nuclear astrophysics, galaxy clusters, large-scale simulations, statistical and computational techniques, and particle astrophysics. MSU astronomers enjoy guaranteed access to the 4.1-m SOAR Telescope, which is co-located on Cerro Pachón with the Large Synoptic Survey Telescope. MSU also hosts the headquarters of the Joint Institute for Nuclear Astrophysics Center for the Evolution of the Elements (JINA-CEE). MSU astronomers run both an astrophysics undergraduate major and an astronomy and astrophysics Ph.D. program.

To ensure a holistic assessment of candidates, we request that applications include:
(1) a 1 page cover letter that frames the application in the context of this ad and MSU's astronomy group.
(2) a CV, including a list of publications, accepted proposals for funding/resources, contributed and invited talks, teaching and mentoring roles, leadership positions, contributions to the academic community, and efforts in public outreach.
(3) a 2–4 page statement highlighting past research successes and future research interests. This statement should also list which one of your lead-author publications you would most like the committee to read.
(4) a 1–2 page teaching statement describing the applicant's educational priorities and plans to address them.
(5) a 1–2 page statement of contributions to the academic community. Faculty assume diverse responsibilities, including fostering student learning, advancing research, disseminating knowledge, and sustaining healthy inclusive communities. The applicant should describe how they have "given back" to their previous institutions and communities, and their interests and plans for enriching the MSU community.
(6) Contact information for three people to provide reference letters on request.

Applications should be submitted through the MSU hiring website (http://careers.msu.edu), posting #XXX. While letters will not be solicited for the initial evaluation of candidates, applicants should ensure that letters will be submitted promptly upon request. The selection process will begin on November 21, 2019, and review of applications will continue until the position is filled.

Questions may be directed to Prof. Laura Chomiuk (chomiuk@pa.msu.edu) or to any other member of the astronomy group. Applicants are encouraged to peruse the MSU astronomy group website https://astro.natsci.msu.edu.

We actively encourage applications from—and welcome nominations of—women, persons of color, veterans, and persons with disabilities, and we endeavor to facilitate employment assistance to spouses or partners of candidates for faculty and academic staff positions. MSU is an affirmative-action, equal-opportunity employer and is committed to achieving excellence through diversity.

Appendix B: Rubric for Triage of Applicant Pool

Based on CV and research statement

Criterion	**Weight**
Ph.D in Astronomy, (Astro)Physics, or related field--- or will have obtained Ph.D by summer 2020.	Must have
Conducts research in astronomy/astrophysics focused on observational, data intensive, or survey astronomy, with at least one lead-author paper published or accepted for publication	Must have
All requested parts of the application submitted by time of review, or supplied quickly upon request	Must have

(in our faculty search, we initially had 67 applicants, and this triage cut the pool to 51 candidates).

Appendix C: Rubric for Selection of Faculty Candidates
Key: 0=Not Qualified 1=Minimally Qualified 2=Competitive 3=Highly Competitive
Demonstrations of meeting criteria are required unless otherwise noted as 'desired'. This rubric is for hiring at the assistant professor level; we also had a similar rubric for candidates applying at the associate/full professor level.

The **Initial Screen** went from the large triaged pool (see Appendix B) to a longlist of ~15 candidates. It was based on CV, research statement, teaching statement, and community contribution statement. At least three committee members looked at each application.

The **Second Screen** narrowed from a longlist of ~15 candidates to a shortlist of ~6 candidates. It was based on reference letters and reading of the candidate's suggested lead-author paper. Materials from the previous stage were also factored in. At this stage, all committee members participated.

The **Third Screen** produced decisions on above/below threshold for hiring for each of the ~6 candidates on the shortlist. This was carried out with on-campus visits, and the rubric criteria below were re-scored using in-person meetings with faculty, students, and postdocs, the job talk, and the committee interview, in addition to the materials used in the initial and second screens. We developed specific interview questions and assigned them as essential pieces of evidence for rating particular criteria.

Criteria	Score (0--3)	Weight
Ability to conduct scholarly research For initial screen, as reflected by: ● Steady production of lead-author refereed papers (~>1/yr during postdoc years is desired) ● Steady production of papers in collaboration with others ● A research statement that demonstrates a productive, impactful past and interesting plans for the future For second screen, as reflected by: ● Criteria described in initial screen rubric (above) ● Lead-author paper brings appropriate data/techniques to bear to effectively address a problem ● Reference letters communicate that the candidate is effective at solving problems and/or their research has had a significant impact on the field (desired)		1.5
Ability to formulate influential, interesting science questions and effectively communicate scientific concepts For initial screen, as reflected by: ● A publication record that is well-cited ● Invitations to give seminars/conference talks (desired) ● A research statement that is easy to follow and understand, and demonstrates solid logic. For second screen, as reflected by:		1

● Criteria described in initial screen rubric ● Lead-author paper demonstrates an ability to synthesize and communicate the work of others ● Lead-author paper tackles a well-motivated science question, and effectively explains how the study makes progress on this question. ● Reference letters imply that the candidate is an effective communicator and collaborator in scientific contexts (desired)		
Potential for obtaining external research funding For initial screen, as reflected by: ● Past success in proposing for telescope time, funding, and/or computer resources (not required, but powerful if demonstrated) ● A research statement that formulates interesting science questions, motivates them effectively, and describes a feasible plan for making progress on them (i.e., what I would expect of a proposal as a reviewer on a funding panel) For second screen, as reflected by: ● Criteria described in initial screen rubric ● Text and figures in the lead-author paper communicate the study's critical findings in a compelling way ● Reference letters communicate that the candidate selects interesting science problems where they can make an impact (desired)		1
Ability to teach and advise student research projects For initial screen, as reflected by: ● Interest in teaching as demonstrated by past experiences, like mentoring students, conducting public outreach, or professional development on teaching/learning ● A well-written research statement that would be mostly understandable to a grad student ● A teaching statement that demonstrates that the candidate has considered barriers to learning and strategies to address them. For second screen, as reflected by: ● Criteria described in initial screen rubric ● Reference letters describe the candidate's effectiveness in mentoring students (desired)		1.5
Ability to work with diverse groups and to contribute to a climate of inclusion For initial screen, as reflected by: ● Past commitment to broadening representation in astrophysics, as demonstrated by experiences described in CV, teaching statement, and/or community contribution statement (not required, but powerful if demonstrated)		1

● Plans to contribute to a climate of inclusion at MSU as described in the teaching statement and/or community contribution statement For second screen, as reflected by: ● Criteria described in initial screen rubric ● Reference letters describe the effectiveness of the candidate's efforts to broaden representation in/improve the climate of astrophysics (desired)		
A commitment to service---for the field of astrophysics, the department, college, university, or public at large as demonstrated in the community contribution statement and discussions with faculty/students/postdocs For initial screen, as reflected by: ● Past efforts to make their home institution a better place, contribute to public outreach, or advance astrophysics as a field/profession on the national scale, as described in CV and community contribution statement (not required, but powerful if demonstrated) ● Plans to make MSU a better place, disseminate science to the public, and/or advance astrophysics as a profession on the national scale For second screen, as reflected by: ● Criteria described in initial screen rubric ● Reference letters describe the effectiveness of the candidate's efforts in public outreach and/or institutional/national service (desired)		1