

# Faculty Search Handbook

## Promoting an Inclusive Process



**School of Science**

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**MIT School of Science**  
**Faculty Search Handbook**

**Introduction**

This handbook provides guidelines and information on conducting inclusive searches at the School of Science (SoS). Diverse and inclusive workplaces not only lead to better work outcomes but foster a healthy work environment (Page, 2007). The tenured faculty at SoS is predominantly White and male (Figure 1). The results of the MIT Quality of Life Survey 2020 showed that underrepresented groups, including at the School of Science, consistently reported having worse experiences than majority groups. Inclusion and a sense of belonging are key to promoting diversity in the workplace (Huntoon et al, 2015), and an absence of role models and representation causes underrepresented groups (gender, race/ethnicity, gender/sexual identity) to leave STEM fields at higher rates than majority groups (Riegle-Crumb et al, 2019). It is therefore important to carefully structure our search and hiring processes so that diversity, equity, and inclusion (DEI) can be incorporated into every step of those processes.

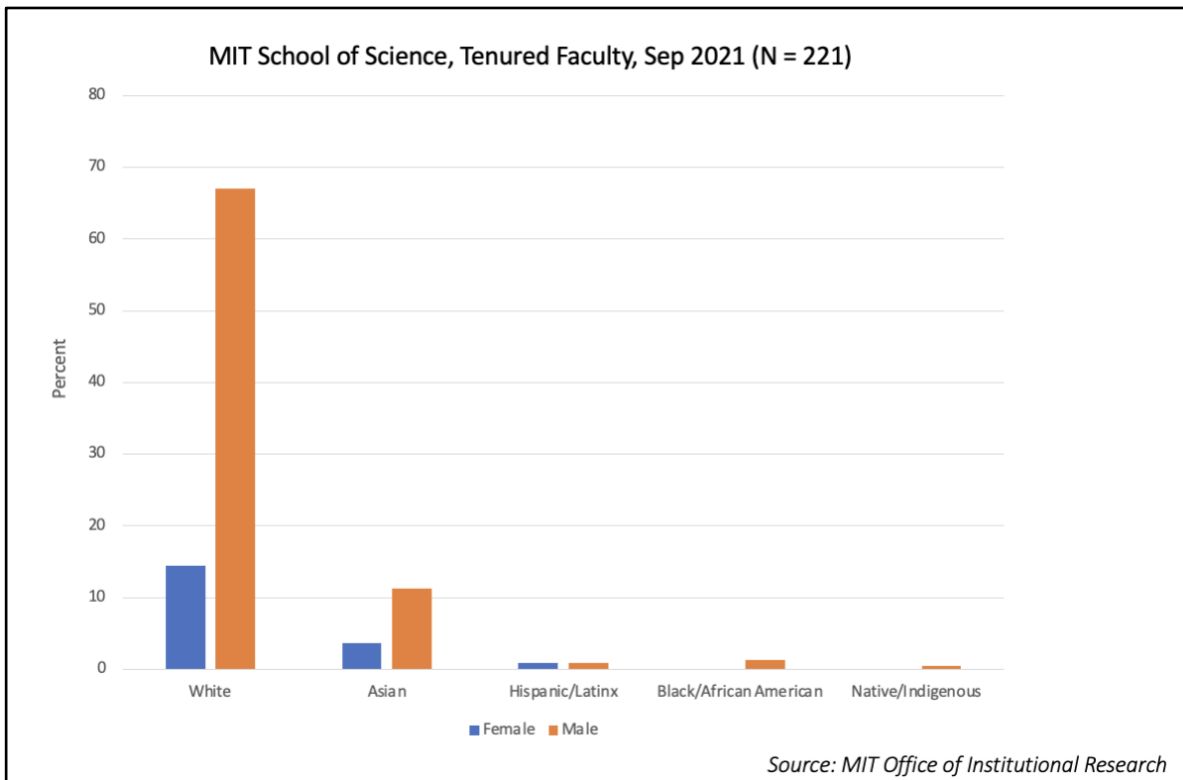


Figure 1: Tenured Faculty Demographics, School of Science

This document is comprised of five sections, each addressing key components of the search and hiring process.

## Section I: Initiating a Search

When initiating a search, some key considerations are:

- **Composition of the search committee:** Appointing a diverse committee – with different perspectives, backgrounds, experiences, and identities – will help promote an inclusive search. The Head of each Department, Lab, Center or Institute (hereafter referred to as “DLC Head”) determines the search committee Chair and number of committee members. DLC Heads should ensure student, postdoctoral, and staff representation on the committee wherever possible. Additionally, one member of the search committee should be designated to ensure that diversity, equity, and inclusion aspects are considered in the search, including the preliminary activities outlined in Section II.
- **Developing a job description:** The language used in job descriptions can signal an inclusive search, and search committees are encouraged to include language on promoting diversity and inclusion. While MIT does have standard language that is used at the end of each advertisement, search committees could use inclusive language in the body of the advertisement. Examples include but are not limited to: *“We are looking for candidates who embody our core values of inclusion and belonging;”* and *“In their research and teaching statements, candidates should also describe any activities that they have engaged in to promote equity and inclusion;”* and *“We are especially interested in candidates whose record of achievements includes leadership in diversity and inclusion.”*
- **Identifying selection criteria:** While commonly identified metrics are publications, teaching activity, research activity, and/or funding, consideration should also be given to activities that promote inclusion – such as outreach to and mentoring (formal and informal) of underrepresented students and postdocs.
- **Components of the job advertisement:** Advertisements must include the following:
  - Research and teaching responsibilities
  - A request for a CV, publication list, research plan, and education plan
  - A request for information on mentoring, diversity, inclusion, and outreach that describes the candidate’s experience in these areas and/or how they envision contributing to departmental and school ongoing efforts. This information could be provided as a stand-alone DEI statement, or it could be woven into the candidate’s teaching and research statement.
  - The number of recommendations required of candidates (minimum of 3 outside letters are required for junior faculty appointments)
  - Deadline for applications
  - Name and address of the MIT contact
  - The MIT affirmative action statement, *“MIT is an equal employment opportunity employer. All qualified applicants will receive consideration for employment and will not be discriminated against on the basis of race, color, sex, sexual orientation, gender*

*identity, religion, disability, age, genetic information, veteran status, ancestry, or national or ethnic origin.” View [MIT Policy on Non Discrimination](#).*

- **Identifying advertising venues:** While default venues are HERC and IM Diversity, which are posted by the DLC, DLCs/search committees must also identify additional diverse venues to post the advertisement. Examples include: Society for the Advancement of Chicanos, Hispanics, and Native Americans in Science: (SACNAS); American Indian Science and Engineering Society (AISES); and National Association of Black Geoscientists (NABG). A longer list of diverse venues can be found in Appendix 1 and we strongly encourage search committees to use them. Besides this, we encourage DLCs to suggest any additional listings they might know of that are not included in Appendix 1.
- **Using social media:** In addition to the above, search committees and departmental communications teams could use social media to advertise a search. This includes, but is not limited to, posting the advertisement on Facebook, Twitter, LinkedIn, and following the accounts of diverse organizations. Some examples are provided in Appendix 1.

## Process of Initiating a Search

Faculty searches require prior approval from the Dean of Science; no search can be posted or advertised before obtaining this approval. This process should be done prior to September 1 each year, and is outlined below:

- The search committee Chair creates a job description after consulting with committee members, and then sends it to the DLC Head for review and approval.
- The DLC Head sends it to the Department’s HQ staff, Human Resources Administrator who will complete the *Request to Search for Faculty* form.
- These are submitted to the Dean of Science for approval, copying the Assistant Dean for HR and Administration (awharvey@mit.edu) and the Assistant Dean for Diversity, Equity, and Inclusion (kdutt@mit.edu).

Note that faculty search approvals expire after 12 months from the date of approval. Additional information and questions regarding searches should be addressed to Assistant Dean for HR and Administration (awharvey@mit.edu).

## Section II: Preliminary Discussions and Outreach by Search Committee

Once the search has been approved and posted, the search committee is encouraged to meet to discuss *active outreach to solicit a diverse applicant pool*. This should include some or all of the following activities:

- **Meeting presentations:** DLCs should ask faculty to include a slide about ongoing searches

when they give talks at scientific meetings or visits to other institutions.

- **Department alumni:** DLCs should reach out to department alumni requesting the names of potential candidates. The search committee can then invite those candidates to apply. These could include a list of fellowship recipients, or other awardees and honorees.
- **Creating a database of potential candidates:** To the extent feasible, each DLC is encouraged to create a database of potential candidates in their field, updated periodically, so that search committees can avail of that database to invite candidates to apply. The DLC should share this database with each search committee. This database could be built using the following components:
  - **Minority Serving Institutions (MSIs):** Departments and search committees are encouraged to check out the [NASA List of Minority Serving Institutions](#) and the [NASA MSI Exchange](#), a searchable list of MSIs offering specific scientific fields. The search committee should reach out to MSIs that have relevant programs/departments, and invite potential candidates to apply.
  - **Fellowship Recipients:** Recipients of prestigious fellowships are another potential group to add to the database. Search committees could invite them to apply.
  - **Award Recipients of Professional Societies:** Professional societies typically announce a list of honorees and awardees annually. The search committee could invite such individuals to apply. Examples of professional societies include: American Physical Society (APS); American Geophysical Union (AGU); and American Chemical Society (ACS). A longer list is included in Appendix 2.

### Section III: Conducting the Search

Following the above, the search committee should do the following:

- **Search committee briefing:** The search committee should attend a briefing on *guidelines and best practices for promoting inclusive searches*. The search committee Chair should schedule this briefing at a time when all (or most) of the committee members can attend. This briefing can be conducted by the DLC's Diversity, Equity, Inclusion Officer (DEIO) where applicable, the Assistant Dean for DEI, or a combination as applicable, with other resources/consultants on or off campus. This will include guidelines on promoting an inclusive search process. Additionally, at this session, search committee members should be provided with a copy of this handbook.
- **Managing applications:** The search committee must obtain all materials requested, including recommendation letters, curriculum vitae, list of publications, and plans for teaching and research. Application materials should be managed in the method that best

suits DLC needs and the reporting requirements of the Institute. The School of Science encourages committees to use Academic Jobs online, a flexible web-based application management system.

- **Demographic data:** The departmental Administrative Officer (AO) has access to the aggregated demographic data (specifically gender and race) of the applicant pool. The AO compares this to the national level data for that field, [using data on who earns a doctorate in US universities](#), published by the National Science Foundation (NSF), and shares the results with the committee.
- **Candidate evaluation tool:** DLCs should develop procedures to promote equity and inclusion in evaluation. An example of a tool that can help standardize the process of evaluating candidates is using a form that solicits evaluation on a range of core criteria (See Appendix 5 for examples).
- **Reading applications thoroughly:** Some strategies to promote an inclusive evaluation of applications include but are not limited to:
  - Discussion of implicit/unconscious biases and strategies to address biases in the selection process.
  - Reading letters of recommendation with the understanding that letters may contain implicit/unconscious biases. See guidelines on avoiding bias in recommendation letters outlined in Appendix 3.
  - Acknowledging that a publication record may have gaps because a candidate took time for familial and/or parental responsibilities, and/or were significantly impacted by the pandemic, all of which tend to disproportionately impact women and people of color.
  - Considering all aspects of the application, including whether they would contribute to diversity, equity, and inclusion (DEI) and whether they have a track record of engaging in formal and/or informal mentoring of underrepresented groups, and/or activities promoting an inclusive work environment and demonstrating community citizenship.
  - Evaluating a candidate on their entire portfolio rather than just one metric such as publications.
  - Defining the research topic broadly rather than narrowly, so as to allow a greater pool of talented applicants to qualify.

#### Section IV: Creating a Shortlist and Interviewing Candidates

Once the above steps have been completed, the search committee will create an initial shortlist, and then following community feedback, will create a final shortlist and interview schedule.

- **Creating an initial shortlist:** The search committee should create an initial shortlist of 15-20% of the candidates. As per MIT policy, while search committees have access to only aggregated demographic data for gender and race/ethnicity, for the most part it is possible to identify gender, and in various instances it is possible to know a candidate's



gender identity and/or race/ethnicity, be it from information in the application, and/or the candidate being well-known in the field. To ensure that underrepresented groups receive appropriate consideration, this initial list, along with dossiers, should be shared with the department's designated Faculty Search Oversight Officers (FSOO), who are faculty members selected by the Department Head and approved by the Dean to oversee and promote faculty diversity. At present the School of Science has 12 FSOOs, two for each department. Following the creation of the initial shortlist, HR generates Affirmative Action reports, indicating the demographics of the shortlisted candidates. The Associate Deans and the Assistant Dean for DEI will review this affirmative action report and discuss with the designated search DEI representative and the FSOO on appropriate next steps.

- ***Soliciting feedback from the department:*** The search committee should solicit feedback from the larger community, including faculty, students, and postdocs. One way to achieve this is to include both a student and a postdoctoral researcher on the search committee. This has already been used in some departments, and offers a high level of transparency and inclusion. An alternate mechanism is to designate a student and a postdoctoral representative from the DLC, who will get feedback from their cohort and share it with the search committee. Soliciting feedback from students and postdoctoral researchers should be done with the same expectation of confidentiality as would be expected when soliciting feedback from faculty.
- ***Creation and approval of final shortlist:*** Following feedback from the FSOO, the designated search DEI representative, the Associate Deans, and others as appropriate, the committee will arrive at the final shortlist (typically 4-6 candidates). These decisions may include acquiring additional information such as: calling referees to address any unanswered questions; and/or soliciting input on candidates mentoring skills (if relevant and/or possible from their mentees). Search committees should conduct initial interviews by Zoom so as to allow for a larger number of interviewees than would otherwise be feasible for in-person interviews. To ensure consistency and fairness, the questions should be the same for all candidates and ideally provided to candidates ahead of time – ***see MIT interviewing guidelines outlined at the end of this section.*** The committee Chair prepares the final short list, search report, and Affirmative Action (AA) Form Part 1. These materials should clearly explain why the candidates were selected over the others and explain the reasons for not selecting others on the shortlist. This should be reviewed by the FSOO, for final approval, and then the DLC Head, who signs off on the report and submits it to the Dean's Office. The Assistant Dean will confirm receipt of the materials with the search Chair, and the AA Form will be shared with the Assistant Dean for DEI and the Associate Deans for approval. ***Once the Dean's office approves this report, the search committee can begin scheduling interviews.*** The final shortlist should be shared with the Dean.
- ***Scheduling interviews:*** Once the final shortlist is approved, the search committee can begin scheduling interviews. To ensure consistency and fairness, the process should be the same for all candidates – ***see MIT interviewing guidelines outlined at the end of this section.*** Please arrange meetings with the Dean or Associate Deans with any candidates whom the search committee feels will be positively influenced by such a meeting. All

interviewed candidates should be given a copy of the [Faculty Benefits Brochure](#).

- **Interview structure:** While each search committee will likely have its own preferred structure for interviewing candidates, ***the same interviewing structure and process must be used for all candidates, including any internal MIT candidates.*** Typically, these include having a candidate give one or more talks, as well as interviews with faculty members, including junior faculty. Committees should also organize meetings with students, postdocs, and Diversity, Equity, and Inclusion (DEI) Officers (or staff equivalent), who should have the opportunity to provide feedback to the committee. All interviewers are also encouraged to review [MIT's Guidelines for Interviewing](#) and the [MIT Human Resources Interviewing Guide](#). Note: In order to maximize participation by the community, it would be useful to record the candidate talks, with the permission of the candidate. MIT Audio Visual provides this service (contact: [avorders@mit.edu](mailto:avorders@mit.edu), 253-2808).

## Section V: Final Selection and Offers

Once the search committee has reached a decision on final candidates, the case is then sent to the DLC Head and/or the rest of the department for final review and approval. Faculty meetings where cases are considered should be scheduled to allow as many faculty members to participate as possible, with adequate advance notice of the meeting's occurrence (approximately 1-2 weeks). The case should be made available for faculty review at least 5 days prior to the meeting to allow comments to be submitted ahead of the meeting.

Once the department decides to make an offer, the DLC Head or their representative contacts the candidate to discuss space, start-up requirements, and other negotiable items required for the offer to be considered and funded by the Dean. Once these questions are resolved, the completed case materials (outlined below) are sent to the Assistant Dean for the Dean's review and approval. ***The dossier sent to the Dean should include a rationale of why the other candidates on the shortlist were not selected.***

### Case requirements:

1. Letter of endorsement from the Department Head.
2. Curriculum Vitae, including a list of publications.
3. Summary of proposed research plan
4. Summary of proposed or potential DEI considerations
5. Outside letters (3 minimum): This typically includes one each from the candidate's thesis advisor and postdoctoral advisor (although exceptions are possible). A minimum of one other outside professional reference, preferably two, must be included.
6. Inside letters (2 minimum): One each from the search committee Chair, and a Departmental faculty member who is familiar with the candidate's research.
7. Affirmative Action Report Part 2
8. Start-up costs breakdown sheet. Please identify how much the Department will provide and how much is being requested of the Dean and Provost.
9. Draft offer letter

10. Space and renovation requirements and costs
11. NIFAL Approval Form

For faculty members who will require modifications to existing space, the Department Headquarters should submit the space change request forms and arrange for a meeting with the candidate and members of the Department of Facilities, the Committee on Renovations and Space Planning, the office of Environmental Health and Safety, and the Assistant Dean to confirm space requirements and generate an estimate of the costs associated with the renovation. This meeting should occur as soon as possible to avoid a delay in making an offer.

Once the case is approved by the Dean and financial support is secured from the Provost, the Assistant Dean notifies the Department Head that the case is approved and confirms any modifications to the start-up package. The Offer letter is prepared by the Department Head and sent to the candidate with a cc: to the Dean and the Assistant Dean for Admin. Once the candidate notifies the Department of his/her decision, the Department Head notifies the Dean of the decision.

**Important! Communications with Faculty Candidates:** A DLC Head or LCI Director may convey to a candidate that a *recommendation* of an offer has been made by the DLC to the department. The LCI Director may ask the candidate about his or her start-up needs. The LCI Director may *not* tell the candidate that an offer will be forthcoming without the written permission of the Department Head, with a copy to the Dean. The Department Head should only provide this permission after the standard procedures of the department have been followed. ***Neither the LCI Director nor the Department Head may provide the details of what the offer will be, even informally, without the prior permission of the Dean.*** The Dean must see the case and approve it before this permission is granted. There must also be agreement between the Dean, Department Head and LCI Director about the size of the startup package and contributions from the department, affiliated units, Dean, and Provost before an offer can be made.

### *Relevant Policies and Resources*

Search committees and DLCs should familiarize themselves with the following MIT policies and procedures:

- [MIT Search, Appointment, and Promotion Process for Faculty](#)
- [MIT Conflict of Interest Policy](#)
- [MIT Non Discrimination and EOAA Policies](#)
- [MIT Faculty Search Committee Handbook](#)
- [MIT's Guidelines for Interviewing](#) and the [MIT Human Resources Interviewing Guide](#)

### *Relevant Forms*

Faculty Search Request forms are available to administrators on the [School of Science Canvas site](#). Please contact the administrative officer or human resources administrator for your unit or the academic department to obtain these forms. In most cases, departmental staff complete all or part of these forms on your behalf.

- Affirmative Action Form Part 1
- Faculty Search Oversight Form
- Affirmative Action Report Part 2
- Start-up costs breakdown sheets (overview and detailed budget). Departments typically provide the NIFAL, moving costs, student support, and at least 50% of the discretionary funds. The Institute typically provides the CIMP and up to 50% of the research discretionary funds. Renovation costs are managed on a case-by-case basis.
- Space and renovation requirements and costs
- NIFAL Approval Form

*Other Search Guidelines:* The following detailed guidelines are also available:

- [A Guide for Search Committees](#): University of Wisconsin-Madison
- [Handbook for Faculty Searches and Hiring](#): University of Michigan

## Appendix 1: Diverse Advertising Venues and Resources\*

- American Indian Science and Engineering Society: [Opportunities Board](#)
- American Physical Society: [Minorities in Physics](#)
- American Psychological Association: [Ethnicity, Race, and Cultural Affairs](#)
- American Psychological Association: [Women's Programs Office](#)
- Association for Women in Science (AWIS): [Career Center](#)
- Black Chemist: [Jobs](#)
- Black in Neuro: [Jobs](#)
- Diverse Issues in Higher Education: [Jobs](#)
- GeoLatinas: Latinas in Earth and Planetary Science: [Outreach](#)
- HBCU Connect: [Career Center](#)
- Higher Ed Jobs: [Jobs](#)
- Hispanic Outlook in Higher Education: [Job Board](#)
- IM Diversity: [Jobs](#)
- Insight into Diversity: [Jobs](#)
- Institute for Broadening Participation: [Pathways to Science](#)
- Journal of Blacks in Higher Education: [Jobs and Opportunities](#)
- LGBT in Higher Ed: [Jobs](#)
- National Association of Black Geoscientists (NABG): [Job Postings](#)
- National Society of Black Physicists: [Jobs](#)
- Out to Innovate, formerly known as National Organization of Gay and Lesbian Scientists and Technical Professionals (NOGLSTP): [Career Resources](#)
- Society for the Advancement of Hispanics/Chicanos and Native Americans in Science: [Job Opportunities](#)
- Tribal College: Journal of American Indian Higher Education: [Job Board](#)
- Women in Higher Education: [Jobs](#)

### Other Recruiting Resources:

#### *Availability Pool:*

- National Science Foundation (NSF): [Survey of Earned Doctorates](#)

### Databases:

- National Aeronautics and Space Administration (NASA): [List of Minority Serving Institutions](#) and the [NASA MSI Exchange](#), a searchable list of MSIs
- Texas Tech University (TTU): [National Registry of Diverse and Strategic Faculty](#)

### Social Media:

In addition to the above, search committees should work with their department communications professionals to post the open positions on their departmental websites and link to these via posts on social media as appropriate.

Search committees are encouraged to follow the social media accounts of professional societies to learn about upcoming conferences and events and to follow conversations to better understand concerns and experiences of underrepresented and marginalized groups in STEM. Here are some social media accounts:

- **American Indian Science and Engineering Society (AISES)**: Twitter: <https://twitter.com/AISES>; Facebook: <https://www.facebook.com/aises.org>
- **Association for Women Geoscientists**: Twitter: [https://twitter.com/AWG\\_org](https://twitter.com/AWG_org) and Facebook: <https://www.facebook.com/AWGeoscientists>
- **Association for Women in Science (AWIS)**: Facebook: <https://www.facebook.com/AssociationforWomeninScience> Twitter: <https://twitter.com/AWISnational>
- **Black in Neuro**: Facebook: <https://www.facebook.com/Black-In-Neuro-105293001684801> Twitter: <https://twitter.com/BlackInNeuro>
- **Earth Science Women's Network (ESWN)**: Twitter: <https://twitter.com/ESWNtweets> ; Facebook: <https://www.facebook.com/ESWNonline>
- **GeoLatinas: Latinas in Earth and Planetary Sciences**. Twitter: <https://twitter.com/geolatinas>; Facebook: <https://www.facebook.com/GeoLatinasFace/>
- **National Association of Black Geoscientists (NABG)**: Facebook: <https://www.facebook.com/NABGSocial> Twitter: <https://twitter.com/NABGSocial>
- **National Organization of Gay and Lesbian Scientists and Technical Professionals (NOGLSTP) / Out to Innovate**: Twitter: <https://twitter.com/STEMforEquality>
- **National Society of Black Physicists (NSBP)**: Facebook: <https://www.facebook.com/NSBPInc/> Twitter: <https://twitter.com/nsbpinc>
- **Women in Higher Education**: Facebook: <https://www.facebook.com/womeninhighered> Twitter: <https://twitter.com/womeninhighered>
- **Pathways to Science, IBP**: Facebook: <https://www.facebook.com/Pathways-to-Science-120825625433/>; Twitter: <https://twitter.com/IBParticipation>

- **Society for the Advancement of Chicanos, Hispanics, and Native Americans in Science: (SACNAS):** Facebook: <https://www.facebook.com/SACNAS> Twitter: <https://twitter.com/sacnas>
- **National Organization for the Professional Advancement of Black Chemists and Chemical Engineers:** Twitter: <https://twitter.com/NOBCChE> Facebook: <https://www.facebook.com/NOBCChE-104489815154525>
- **Black Chemist:** Twitter: <https://twitter.com/BlackChemistJob>
- **Black in Chem:** Twitter: <https://twitter.com/BlackinChem>

*\*If you know of additional venues to add to this list, please contact the Dean's Office ([kdutt@mit.edu](mailto:kdutt@mit.edu))*

## Appendix 2: List of Professional Societies

Professional societies typically offer annual honors and awards to outstanding scientists and researchers. Search committees should reach out to relevant recipients and invite them to apply for the search. Here are some professional societies relevant to science.

- American Association for the Advancement of Science
- American Astronomical Society
- American Chemical Society
- American Geophysical Union
- American Institute of Biological Sciences
- American Institute of Physics
- American Mathematical Society
- American Nuclear Society
- American Physical Society
- American Society for Cell Biology
- American Society for Biochemistry and Molecular Biology
- Geochemical Society
- Geological Society of America
- Materials Research Society
- Mathematical Association of America
- National Association of Geoscience Teachers
- Optical Society of America
- Society for Industrial and Applied Mathematics
- Society for Integrative and Comparative Biology



## Appendix 3: Guidelines on Avoiding Bias in Letters of Recommendation

These guidelines, along with a complete bibliography, will be provided to search committees at the time of the briefing on best practices for inclusive searches.

Research shows that men usually receive stronger letters than women,\* and that both male and female letter-writers exhibit similar biases. While research on recommendation letters often focuses on gender bias, there are other types of bias as well. Research also shows that there is often bias in how some people's contributions are perceived, and this can impact how they are described in letters of recommendation. And given the significant role that recommendation letters play in hiring decisions, reducing bias in these letters will help promote equitable and inclusive searches in STEM fields.

**Communal vs. agentic:** Women tend to be described in communal terms (“reliable”; “caring”) and men in agentic terms (“confident”; “assertive”), and these communal terms tend to have a negative impact on hiring decisions (Madera et al., 2009). Try to counteract this tendency by mentioning other character traits, e.g., “highly motivated”, “dynamic”, “passionate”.

**Accomplishments:** Take care to mention accomplishments, including publications, as research suggests that men are more likely to cite themselves compared to women (King et al., 2017). Also mention any DEI-related contributions and accomplishments, as underrepresented groups play a disproportionate role in advancing diversity and inclusion (Jimenez et al., 2019).

**Skills:** Before writing a letter look at the job description and identify the necessary skills. Examples could include “creativity”, “problem-solving skills”, “analytical skills”. This will help avoid reliance on gendered language.

**Assigning credit:** Be mindful when assigning credit – research shows that men are more likely to be credited with the big picture (e.g., vision, ideas) whereas women are more likely to be credited with supporting roles and providing the labor of science (Macaluso et al., 2016).

**Letter tone:** Research shows that the tone and language of letters written for male applicants are stronger than those written for women (Dutt et al., 2016) and that women are more likely to be described with doubt raisers (Trix and Psenke, 2003).

**“Hardworking” and “intelligent” – to use or not to use:** Previous research (Trix and Psenke, 2003) suggests that words like “hardworking” and “intelligent” – labeled “grindstone” adjectives – might be deterrents for women. However, the overwhelming majority of the letters examined in Dutt et al. (2016) described candidates as hardworking and intelligent. The main difference was that some letters went significantly beyond that to describe the candidate in outstanding terms, while others did not. So, the key question is not whether to use words like “hardworking” and “intelligent”, but more importantly, what is the best thing that is being said about the candidate?

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\* The studies on gender differences mentioned in this document use binary identifiers – male or female.

**Avoid rushing:** Evaluate materials without rushing as we are more likely to make snap judgments when rushing or under stress, causing us to rely on stereotypes and implicit bias.

**Avoid qualifiers and stereotypes:** Avoid qualifiers wherever possible, e.g., “For someone with two small children, she is a very productive scientist”. Similarly, avoid comments that reinforce stereotypes, e.g., “As a Black scientist, she is a credit to her race” and “For an Asian his English is very good.”

**John or Jennifer:** A study found that male applicants for a lab manager position were ranked more highly than female applicants with identical qualifications (Moss-Racusin et al., 2012).

**Innate brilliance:** A study found that women and people of color (especially African Americans) were stereotyped as not possessing the raw talent and innate brilliance perceived as a requirement for certain fields such as STEM (Leslie et al. 2015). In a similar vein, another study found that words like “brilliant” and “genius” in online teaching evaluations were significantly lower for women and African Americans (Storage et al., 2016)

**Racial/ethnic bias:** A study found that CVs with western names like Emily and Greg were 50% more likely to receive interview callbacks than identical CVs with ethnic names like Lakisha and Jamal (Bertrand and Mullainathan, 2003)

**Intersectionality:** Women of color tend to have worse experiences in STEM (Clancy et al., 2017) including the highest levels of harassment. They are also less likely to be invited to give talks (Ford et al., 2019). Additionally, studies showed that women and people of color (especially Black scientists) received less NIH grant funding than similarly qualified men and/or White scientists (Oliveira et al., 2019, Ginther et al., 2011).

**Role of recommendation letters:** Letters of recommendation play a significant role in STEM hiring decisions (Potvin et al., 2017, Madera et al., 2009), so taking steps to reduce bias in these letters will help promote equitable and inclusive searches in STEM fields.

**Concluding note:** The overarching goal is not to simply start writing stronger letters for everyone; rather, it is to ensure that similarly qualified applicants are described in similar language, thereby avoiding unconscious biases in the STEM hiring process.

## Appendix 4: Summary of Social Science Research on Implicit Bias

This section provides a summary of the social science research documenting implicit bias. This summary, along with a complete bibliography, will be provided to search committees at the time of the briefing on best practices for inclusive searches. Research shows that we all tend to hold unconscious/implicit biases, whatever our identity. These begin in early childhood and continue in adulthood. Unless checked, these biases disproportionately affect underrepresented and marginalized groups. These are apparent in the following:

### *Gender Bias\**:

- **Hiring:** In one study, application materials for a lab manager position were randomly assigned a male or female name, and science faculty were asked to rate the application materials. Faculty rated the male applicant as significantly more competent and hireable than the (identical) female applicant, and offered a higher starting salary. Both male and female faculty were equally likely to exhibit bias against the female student. (Moss-Racusin et al, 2012). An older study found that both men and women were more likely to select a male applicant than a female applicant with an identical record, and credit the male applicant with more teaching, research and service experience compared to the female applicant with an identical record (Steinpres et al., 1999).
- **Nonbinary and Transgender:** Using data from the National Transgender Discrimination Survey, a study found that being out as a nonbinary transgender person has different effects on nonbinary transgender people based on sex assigned at birth, with those assigned male at birth (AMAB) tending to be discriminated against in hiring but those assigned female at birth (AFAB) more likely to experience differential treatment once hired. Transgender women tend to have worse employment experiences than nonbinary transgender people and transgender men, the latter two tending to have similar outcomes (Davidson, 2016).
- **Letters of Recommendation:** A study of recommendation letters in the geosciences found that regardless of the gender of the letter writer, male applicants were more likely to receive outstanding letters compared to female applicants (Dutt et al, 2016). Another study found that women were more likely to be described in communal terms (e.g., “reliable” or “caring”) and men in more agentic terms (e.g., “confident” and “dynamic”), and that these communal characteristics were negatively related to hiring decisions based on letters of recommendation (Madera et al, 2009). A study in medicine found that men were more likely to be described as “brilliant” and “superb” while women were more likely to be described as “hardworking” and “intelligent” (Trix & Psenke, 2003).
- **Reviewing Journals:** A study in the geosciences found that women were used less as reviewers than expected (on the basis of their proportion of membership of the society and as published authors in journals). The bias was a result of authors and editors, especially male ones, suggesting women as reviewers less often, and a slightly higher decline rate among women in each age group when asked (Lerback and Hanson, 2017).

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\* The studies on gender differences mentioned in this document use binary identifiers – male or female

- **Salaries:** A report in Nature revealed that female scientists earn between 25% and 40% less than their male counterparts (Shen, 2013). Studies also show that salaries for women don't progress as quickly as salaries for men (Valian, 2005), and that women ask for less than their male colleagues (Babcock & Laschever, 2003).
- **Performance Evaluation:** Data from symphony orchestra auditions showed that with the introduction of blind auditions (i.e., the judges did not know the gender of the person auditioning), the number of women hired increased significantly. (Goldin and Rouse, 2000).
- **Teaching Evaluations:** A study found that a professor with a male name received higher teaching evaluations than an identical professor with a female name, and that this bias was not limited to subjective aspects such as how good the students believed the teacher was, but also for objective questions such as whether the teacher returned homework assignments on time (Boring et al, 2016).
- **Scientific Contribution:** A study found that women disproportionately perform the labor and experimental work of producing science – such as pipetting and centrifuging – while men are more likely to be credited for the bigger picture such as conceiving ideas and analyzing data (Macaluso et al, 2016).
- **Entrepreneurial Ventures:** A study found that investors preferred entrepreneurial ventures pitched by a man over identical ventures pitched by a woman by a rate of 68% to 32%. Investors found the male pitches more “persuasive, logical, and fact-based” than the *identical* female pitches (Brooks et al., 2014).
- **Math Task:** A study found that without any information other than a candidate's appearance, both men and women were twice as likely to hire a man than a woman to do an arithmetic task that, on average, both genders perform equally well. This discrimination survived if performance was self-reported because men had a greater tendency to boast about their performance. This discrimination was reduced but not eliminated by providing full information about previous performance on the task (Reuben et al., 2014).
- **Publications:** A study of postdoctoral fellowships found that peer reviewers gave female applicants lower scores than male applicants who showed the same level of scientific productivity. The study also found that women needed 2.5 times more publications as men to achieve the same rating on scientific competence as men. The study also found a “friendship bonus” i.e., knowing someone on the review panel improved one's rating of scientific competence (Wenneras and Wold, 1997).
- **Citations:** A study found that men were more likely to praise their own research as “excellent” and “unique” and “novel” compared to women (Jagsi and Silver, 2019). An earlier study found that men cited their own papers 56% more than women on average, and that this gender gap in self-citation remained stable despite increased representation of women in academia in recent decades (King et al, 2017). A 2021 study found that articles in high-impact journals written by women primary or senior authors had fewer citations than those written by men primary or senior authors. Articles written by women as both primary and senior authors had approximately half the number of

citations as those authored by men as both primary and senior authors (Chatterjee et al, 2021).

- **Negotiations:** A study found that women who negotiated a higher salary were perceived as being more difficult and less nice to work with compared to men who negotiated a higher salary (Bowles et al., 2005). Another study found that due to the negative stereotype of aggressiveness associated with women leaders, women avoided leadership opportunities (Davies et al., 2005).
- **Attitude Towards Evidence of Gender Bias:** A study found that men evaluated gender bias research less favorably than women, and this was especially prominent among male faculty in STEM fields (Handley et al, 2015).

### *Race & Ethnicity Bias, and Intersectionality:*

- **Speaking Opportunities:** A study found that female scientists were invited and assigned oral presentations less often than men at conferences, and that male primary conveners allocated invited abstracts and oral presentations to women less often and below the proportion of women authors (Ford et al, 2018). A related study found that women of color – in particular from underrepresented minorities – were least likely to be invited to speak at conferences (Ford et al, 2019).
- **Innate Talent:** A study found that women and minorities (particularly African Americans) were underrepresented in fields where raw innate talent and brilliance were considered a requirement for success in those fields, since they were stereotyped as not possessing such brilliance. This bias was reduced for Asians (Leslie et al, 2015). Another study found that words like “brilliant” and “genius” in online teaching evaluations were significantly lower for women and African Americans (Storage et al, 2016).
- **Workplace Experiences:** A study in astronomy and planetary science found that women of color experienced the highest rates of negative workplace experiences, including harassment and assault (Clancy et al. 2017).
- **Leaving STEM Fields at Higher Rates:** A study found that while Black, White, and Hispanic/Latinx students were similarly likely to enroll in STEM fields, Black and Hispanic/Latinx students left STEM at higher rates, even for students with similar academic preparation (Reigle-Crumb et al, 2019)
- **“Where Are You Really From?”** A study found that Asian Americans commonly experience identity denial, and are perceived as less American than other groups (Cheryan and Monin, 2005)
- **NIH Grant Awards:** A study revealed that Black scientists were far less likely to receive NIH funding for a research idea than White scientists from a similar institutions and research records. A smaller gap was also found for Asians, though this gap disappeared when only US citizens were included. (Ginther et al., 2011). A more recent study showed that for early career scientists, women received approximately \$41,000 less grant funding on average than male scientists (Oliveira et al, 2019)

- **Foreign Accents:** Non-native accents make it difficult for native speakers to understand what is being said, and thereby reduces cognitive fluency, i.e., the ease with which the brain processes it. A study found that this caused people to doubt the veracity of what was being said. This credibility bias was somewhat reduced for milder accents compared to heavier accents (Lev-Ari and Keysar, 2010).
- **Interview Callback:** Using fictitious resumes a study found a significant racial gap in callbacks for interviews. Resumes with traditionally White names such as Emily and Greg elicited 50% more callbacks than similar resumes with Black/ethnic names such as Lakisha and Jamal. (Bertrand and Mullainathan, 2003).
- **Treatment of Ambiguity:** A study found that White participants did not discriminate against Black candidates relative to White candidates when the candidates' qualifications were clearly strong or weak, but they discriminated against Black candidates when the decision was more ambiguous. That is, when a candidate's qualifications for a position were ambiguous, bias against Black people was stronger than bias against equally qualified White people (Dovidio and Gaertner, 2000).

#### *LGBTQ+ Bias:*

- **Leaving STEM at Higher Rates:** A study found that LGBTQ students were more likely to leave STEM majors than their straight counterparts (Hughes, 2018)
- **Workplace Experiences:** A study found that after controlling for variation by demographic, discipline, and job factors, LGBTQ STEM professionals were more likely to experience career limitations, harassment, and professional devaluation than their non-LGBTQ peers. They also reported more frequent health difficulties and were more likely to intend to leave STEM (Cech and Waidzunus, 2021).
- **Harassment:** While women commonly experience more harassment than men, a study found that LGBTQ+ women and gender minorities in particular were more likely to be harassed than cisgender, heterosexual women (Richey et al, 2019).
- See also **Nonbinary and Transgender** section under **Gender Bias** on Page 15

## Appendix 5: Candidate Evaluation Tool

The following offers a method for department faculty to provide evaluations of job candidates. This is a template that departments can modify as necessary for their own uses. The proposed questions are designed for junior faculty candidates; however, alternate language is suggested in parenthesis for senior faculty candidates.

Candidate's name:

Please indicate which of the following are true for you (check all that apply):

- Read candidate's CV
- Read candidate's scholarship
- Read candidate's letters of recommendation
- Read candidate's statements (e.g., research, teaching, diversity)
- Attended candidate's job talk
- Attended lunch or dinner with candidate
- Met with candidate
- Other (please explain):

Please rate the candidate on each of the following:	excellent	good	neutral	fair	poor	unable to judge
Potential for (Evidence of) scholarly impact						
Potential for (Evidence of) research productivity						
Potential for (Evidence of) research funding						
Potential for (Evidence of) collaboration						
Potential for (Evidence of) promoting diversity, equity, and inclusion						
Fit with department's priorities						
Ability to make positive contribution to department's climate						
Potential (Demonstrated ability) to attract and mentor graduate students						
Potential (Demonstrated ability) to teach and mentor undergraduates						
Potential (Demonstrated ability) to mentor diverse students						
Potential (Demonstrated ability) to be a conscientious community member						

Other comments?

For more information about this form, visit: <https://advance.umich.edu/resources/>

## Appendix 6: Bibliography

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