Inclusive Astronomy 2015 Recommendations (or the "Nashville Recommendations")

Final Version for AAS Council Endorsement of Vision Statement

Executive Summary

In June 2015, 160 astronomers, sociologists, policy makers and community leaders convened the first *Inclusive Astronomy* meeting at Vanderbilt University, in Nashville, TN. The goal of this meeting was to discuss the issues affecting people of color; lesbian, gay, bisexual, transgender, genderqueer/genderfluid, agender, intersex, queer, questioning, or asexual (LGBTIQA*) people; people with disabilities; women; people disenfranchised by their socio-economic status; and everyone who holds more than one of these underrepresented identities in the astronomical community. A key focus of this meeting was examination of issues of intersectionality: the well-established conceptualization that racism, sexism, heterosexism, transphobia, and ableism are often linked (e.g., that women of color are faced with the intersection of racism and sexism).

The following recommendations emerged as some of the first steps towards our shared goals, through the synthesis of prior work[1,2,3,4] , input from community members, consultation with expert practitioners, and discussions and workshops during the conference itself. All guidelines and recommendations in this document should be interpreted in a way that benefits historically underrepresented groups.

The recommendations presented here cover the four broad topical areas that the conference addressed, namely:

1) Removing barriers to access - This topical area addresses academic barriers to educational access, such as the use of GRE scores in admissions decisions, financial barriers to graduate school application, stereotype threat, and accessibility issues that impede the ability of all students to directly participate in learning environments.

2.) Creating inclusive climates - In order to maintain diversity at astronomical institutions, it is necessary that the environment be inclusive. This topical area addresses microaggressions,

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[1] The Baltimore Charter for Women in Astronomy (1993). Retrieved from: http://www.stsci.edu/stsci/meetings/WiA/BaltoCharter.html

[2] Equity Now: The Pasadena Recommendations for Gender Equality in Astronomy (2005). Retrieved from: http://www.aas.org/cswa/pasadenarecs.html

[3] Supporting LGBT+ Physicists & Astronomers: Best Practices for Academic Departments (2014). Retrieved from: http://lgbtphysicists.org/files/BestPracticesGuide.pdf

[4] Norman, D., Isler, J., Oluseyi, H., Morrison, N., Simpson, C., Trouille, L. (2013). *Women of color in astronomy and astrophysics.* Seeking Solutions: Maximizing American Talent by Advancing Women of Color in Academia, National Academies Press, Washington D.C.

how to honor diversity without tokenization, effective and accessible teaching methods, and effective mentoring.

3.) Improving inclusion and access to power, policy, and leadership -This topical area provides astronomers with strategies on how to play a role in decisions affecting the astronomical community and how people in power can be more inclusive in their decision making.

4.) Establishing a community of inclusive practice - This topical area provides techniques for astronomers to take active rather than passive measures to ensure that their groups, events and institutions are inclusive.

This is a living document. This set of recommendations was compiled as a product of the inaugural Inclusive Astronomy meeting, and builds upon numerous concurrent sets of recommendations[5,6,7,8] These recommendations are imperfect and incomplete, and should continue to be expanded, revised, and critiqued with significant input from the astronomical community, especially the marginalized groups mentioned above, ideally at future Inclusive Astronomy meetings. The goal is to act as a roadmap for equity and inclusion in astronomy.

How to engage with this document: The recommendations are described in increasing detail as one proceeds through the document. Below we list the codes used to identify key participants/stakeholders affected by each recommendation and the estimated timescale for implementing them. Summary tables describing each recommendation in addition to their intended goals are listed and are broken down by implementation timescale. These summaries are intended to inform the overall "spirit" of the recommendations for a given topical area. Immediately following are specific, actionable recommendations that undergird the summary tables, which are designed for implementation by a variety of stakeholders on the prescribed timescales.

Acknowledgements

The organizers of the inaugural Inclusive Astronomy conference wish to acknowledge generous financial support from the National Science Foundation, the Association of Universities for Research in Astronomy, Associated Universities Inc., the American Astronomical Society, Vanderbilt University, and the Fisk-Vanderbilt Masters-to-PhD Bridge Program. Furthermore, we

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[5] The Baltimore Charter for Women in Astronomy (1993). Retrieved from: http://www.stsci.edu/stsci/meetings/WiA/BaltoCharter.html

[6] Equity Now: The Pasadena Recommendations for Gender Equality in Astronomy (2005). Retrieved from: http://www.aas.org/cswa/pasadenarecs.html

[7] Supporting LGBT+ Physicists & Astronomers: Best Practices for Academic Departments (2014). Retrieved from: http://lgbtphysicists.org/files/BestPracticesGuide.pdf

[8] Norman, D., Isler, J., Oluseyi, H., Morrison, N., Simpson, C., Trouille, L. (2013). *Women of color in astronomy and astrophysics.* Seeking Solutions: Maximizing American Talent by Advancing Women of Color in Academia, National Academies Press, Washington D.C.

wish to thank those involved at every level of conception, planning and execution of the conference and these recommendations.

Codes used in recommendations

Participants/Stakeholders:
[IND] = individuals
[SJ] = diversity/social justice experts
[LEAD] = people in leadership roles
[ ] = academic departments
[UNI] = universities and academic institutions
[MSI] = minority serving institutions
[MAJ] = majority institutions
[GOVT] = government labs/organizations, federally funded research centers
[COR] = private/corporate research institutions
[NPO] = soft money nonprofits
[PRO] = professional associations
[PUB] = publishers
[POL] = policy makers
[FA] = funding agencies

Scope of implementation
<short> = short-term (1-3 years)
<med> = medium-term (3-5 years)
<long> = long-term (>5 years)

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Vision Statement

Statement of the problem

The demographics of our nation are changing, but professional Astronomy is not keeping pace. Only 2.1% of astronomers identify as Black or African-American and 3.2% as Hispanic, Latina/o, or of Spanish origin and extremely few are Native or indigenous (AIP, 2014). Disappointingly, these numbers for Physics and Astronomy have remained essentially constant between 2004 and 2012. This underrepresentation is most acute in leadership roles and on the key committees that shape the future of our field.

This underrepresentation for people of color is reminiscent of that experienced by women in decades past, and this gives cause for hope. White women have made great progress in Astronomy since the 1992 Baltimore Charter[9], owing in large part to the courageous leadership of those women and their allies who rallied the community and organized action, including the 1992 Baltimore Women in Astronomy meeting, the 2003 Pasadena Women in Astronomy II meeting, and the 2009 Goddard Women in Astronomy meeting. While the accomplishments of women continue to be systematically undervalued and they remain underrepresented in senior leadership positions, the gains made over the past 25 years served as inspiration for an inaugural Inclusive Astronomy 2015 meeting in Nashville, focusing not only on women but on all underrepresented individuals.

Much of the work toward equity and inclusion in Astronomy has focused on single dimensions of identity. However, a one-dimensional approach leaves behind people with more than one marginalized identity. Intersectionality[10] is the well-established concept that different forms of discrimination intersect for people with multiple marginalized identities; identity and oppression are matrices, not scalars. But the significant underrepresentation of individuals with particular intersectional identities can magnify marginalization with the additional challenges of isolation and lack of common voices for advocacy. For example, in 2012, there were fewer than 75 faculty members in Physics or Astronomy in the United States who are both female and African-American or Hispanic[11].

There are little data available on the numbers or experiences of persons with disabilities in astronomy, but anecdotal reports make clear that people with disabilities still experience

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[9] The Baltimore Charter for Women in Astronomy (1993). Retrieved from: http://www.stsci.edu/stsci/meetings/WiA/BaltoCharter.html

[10] Kimberle Crenshaw, “Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics”, The University of Chicago Legal Forum 1989, 139-168

[11] Rachel Ivie, Garrett Anderson, & Susan White, "AIP Focus on African Americans & Hispanics among Physics & Astronomy Faculty", AIP Statistical Research Center, July 2014 http://www.aip.org/sites/default/files/statistics/faculty/africanhisp-fac-pa-123.pdf

significant lack of access to both physical spaces and to the tools of the profession. Similarly, there are little data published on LGBTIQA*[12] individuals in Astronomy, but studies in other STEM (science, technology, engineering and mathematics) fields point out negative experiences and outcomes for these groups. In one study, LGBT professionals in STEM and military-related federal agencies were found to be more underrepresented and report more negative outcomes in workplace experience than those in non-STEM agencies, despite federal protections and formalized advancement procedures[13]. LGBTIQA* scientists are far less likely to be open about their sexual and gender orientation than are individuals in the wider population, a situation linked to higher rates of anxiety, depression, and burnout[14,15]. Asian Americans in Astronomy are often overlooked in discussions of inclusivity, but data highlight pervasive stereotyping and reveal that Asian Americans are disproportionately excluded from leadership positions[16].

As these examples suggest, the ongoing underrepresentation of individuals from various groups is not just a problem of experiences and barriers within our profession. We live in societies that host systemic biases and power differences based on race, gender identity, sexual orientation, ability status, and class. As we work for equity and inclusion in our field, we cannot ignore the broader society and the negative impacts it produces on current and potential colleagues from historically marginalized groups. We can repair the “leaky pipeline” within our profession only by also understanding the broader society within which our profession operates, the lived experiences of our students and colleagues when they are “out in the world”, and the biases that we all bring with us from the broader society into the places where astronomers work and learn. Indeed, most astronomers who are some combination of female, LGBTIQA*, disabled, or a person of color, can tell stories of overt discrimination, microaggressions, and hostile climate;

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[12] Lesbian, gay, bisexual, transgender, non-binary, genderqueer/genderfluid, agender, intersex, queer, questioning, or asexual. The asterisk is commonly-used to represent individuals with non-conforming gender identities.

[13] Cech, E. A. (2015, June). *LGBT Professionals’ Workplace Experiences in STEM-Related Federal Agencies.* Paper presented at 2015 ASEE Annual Conference and Exposition, Seattle, Washington. 10.18260/p.24431

[14] Yoder J. B. & Mattheis A. "Queer in STEM: Workplace experiences reported in a national survey of LGBTQA individuals in science, technology, engineering, and mathematics careers." *Journal of Homosexuality,* 2014

[15] Juster R. P., Smith N. G., Ouellet É., Sindi S., Lupien S. J. 2013, “Sexual orientation and disclosure in relation to psychiatric symptoms, diurnal cortisol, and allostatic load.” *Psychosomatic Medicine, 75*(2), 103-116

[16] Ruttimann, J., "Breaking Through the "Bamboo Ceiling" for Asian American Scientists." Science, May, 2009. DOI: 10.1126/science.opms.r0900072

the literature tells that same story[17,18,19,20,21,22]. ***The situation is clear: Astronomy must become more inclusive.***

Creating a more inclusive field is not just the right thing to do: The current lack of diversity and inclusivity within Astronomy harms our profession. Research shows that diversity leads to greater innovation, more creative thinking, and higher quality science[23,24,25,26,27]. The breadth of knowledge and experience brought by people of color, women, LGBTIQA* people, people with disabilities, other traditionally marginalized individuals -- and most particularly, anyone who shares more than one of these identities -- is necessary to achieve our full potential for discovery and exploration, and to recruit and retain the many creative minds we need to solve fundamental questions about the Universe. Making Astronomy more inclusive and thus diverse is also necessary for maintaining the appreciation of our field by the increasingly diverse public who fund our exploration.

Our vision: Astronomy can and must become inclusive.

We believe that people of all races, genders, sexual orientations, and physical abilities are capable of doing excellent science and shaping the future of our discipline. We know that identity is intersectional, and we see connections among barriers facing communities of color, women, people with disabilities, and LGBTIQA* people in science. We believe in equal

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[17] Cech, E. A. & Waidzunas, T. J. (2011). *Navigating the heteronormativity of engineering: the experiences of lesbian, gay, and bisexual students.* Engineering Studies, 3(1), 1-24

[18] Rankin, S. R., Reason, R. D. (2005). Differing perceptions: How students of color and white students perceive campus climate for underrepresented groups. *Journal of College Student Development, 46*(1), 43-61

[19] Patridge, E.V., Barthelemy, R. S., Rankin, S. R. (2014). Factors impacting the academic climate for LGBQ STEM faculty. *Journal of Women and Minorities in Science and Engineering 20*(1), 75-98

[20] Morris, L .K., Daniel, L. G, (2008). Perceptions of a chilly climate: Differences in traditional and non-traditional majors for women. *Research in Higher Education, 49*(3), 256-273

[21] Hedrick, B., Dizen, M., Collins, K., Evans, J., Grayson, T. (2010). Perceptions of college students with and without disabilities and effects of STEM and non-STEM enrollment on student engagement and institutional involvement. *Journal of Postsecondary Education and Disability, 23*(2), 129-136.

[22] Johnson, D. R. (2012). Campus racial climate perceptions and overall sense of belonging among racially diverse women in STEM majors. *Journal of College Student Development, 53*(2), 336-346.

[23] Antonio, A. L., Chang, M. J., Hakuta, K., Kenny, D. A., Levin, S., Milem, J. F. (2004). Effects of racial diversity on complex thinking in college students. Psychological Science, 15(8), 507-510

[24] Sommers, S. R. (2007). Race and the decision making of juries. Legal and Criminal Psychology, 12, 171-187

[25] Phillips, K. W., Apfelbaum, E. P. (2012), Delusions of Homogeneity? Reinterpreting the Effects of Group Diversity, in Margaret A. Neale, Elizabeth A. Mannix (ed.) *Looking Back, Moving Forward: A Review of Group and Team-Based Research (Research on Managing Groups and Teams, Volume 15)* Emerald Group Publishing Limited, pp.185 - 207

[26] Loyd, D. L., Wang, C., Phillips, K. W., & Lount, R. (2013). Social category diversity promotes pre-meeting elaboration: The role of relationship focus. *Organization Science, 24*, 757-772

[27] Freeman, R. B., Huang, W. (2014). Strength in Diversity. *Nature, 513*, 305.

opportunity. We share a vision of a more inclusive, more productive profession. We know that true inclusion and diversity require hard work from individual astronomers, organizations, and our profession as a whole to re-examine our professional culture, modify our existing practices, and remove barriers to inclusion. We assert that progress can and should be measured, and should be pursued with the same zeal as other strategic scientific goals. We have faith that we all - as colleagues and as a profession - can learn and improve.

We invite all to join in the hard work of creating an Inclusive Astronomy by endorsing this vision and by committing to implement the Nashville Recommendations for Inclusive Astronomy.

A Pathway to Endorsement

The Inclusive Astronomy recommendations represent a suite of principles, policies and actions that are meant to transform our community into one that is truly inclusive and diverse. Because these recommendations vary in scale, scope and target, ***we recommend the following steps*** be taken toward community and institutional endorsement and implementation of those specific recommendations deemed most appropriate by a given institution or entity:

1. AAS endorses the Inclusive Astronomy vision statement, and encourages the astronomical community to review the full set of Nashville Recommendations and to create implementation plans as appropriate at relevant institutional levels.
2. AAS provides an online framework to host the recommendations, findings, institutional commitments, and accomplishment of those commitments, to be managed jointly by members of the Committee on the Status of Women in Astronomy (CSWA), Committee on the Status of Minorities in Astronomy (CSMA), Committee on Sexual-orientation and Gender Minorities in Astronomy (SGMA), and the Working Group on Accessibility and Disability (WGAD).
3. Following the AAS creation of online platform above, individual institutions and organizations use the online platform to publicly endorse the Inclusive Astronomy vision statement and to commit to specific short-term, medium-term, and long-term recommendations most relevant to each organization or institution.
4. Institutions commit to regularly report back to the community, including actions taken, status of plans, and pathways for successful implementation. These updates should be shared via the AAS online framework (see #2 above).
5. AAS and its Committees (CSWA, CSMA, SGMA and WGAD) establish a site visit program for participating institutions to voluntarily and confidentially assess implementation of inclusivity plans and identify areas where further work is needed.
6. AAS supports sessions at its annual meetings to further develop recommendations and assessments, and to share experiences of implementation.
7. National Research Council (NRC) inclusively empanels diverse individuals -- including individuals with appropriate expertise in diversity and inclusions issues -- for the 2020 Decadal Survey. The community develops recommendations (i.e., not merely findings as in previous decadal surveys) for inclusion in the 2020 Decadal Survey that address needed policies, funding, and ways to increase diversity at leadership levels, that can be acted upon by policy makers and funding agencies.

Recommendations Summary Tables

Removing Barriers to Access: Recommendations Summary Table

Context: We must enable people to enter the field so that we can then support, mentor and promote them within the inclusive environments that we create, and into the leadership and power structures of the field. Our ultimate goal is a fully inclusive field. This is necessary but not sufficient: removing the barriers to access will not by itself create an inclusive environment; we also need to change the culture of our field and make sure that people with marginalized identities are included in our field's leadership. The following table summarizes the full recommendations.

Core Goals:

1. **Make graduate admissions fair.**
2. **Eliminate barriers in pre-/early-college access to astronomy.**
3. **Eliminate practices in hiring and promotion that are discriminatory.**
4. **Ensure that astronomical institutions, facilities, and data are accessible to all.**

Short term goals/actions	Target stakeholders
Develop and deploy best-practice, research-based tools for evaluating graduate school applications holistically and equitably: Eliminate the General and/or Physics Graduate Record Exams (GRE) for graduate school admission (see the AAS statement of endorsement), and integrate holistic measures of scientific talent into graduate admissions procedures (see, e.g., the Fisk-Vanderbilt Bridge Program toolkit for sample protocols and rubrics).	Universities
Make graduate school applications affordable: Reduce or eliminate graduate school application fees.	Universities
Develop, publicize, and follow clear criteria for hiring and evaluations. De-emphasize student teaching evaluations as they have been shown to be systematically biased. Make hires in broad areas of research topics. Develop a common application service for job applications to reduce workload on applicants.	Universities
Recognize disability issues at the same level as minority & gender issues. AAS and other professional organizations should create a committee or working group to advise on the status of astronomers with disabilities,	Professional associations

with disabled students and astronomers in leadership positions on these committees.	
Medium term goals/actions	**Target stakeholders**
Implement and support bridge programs and other collaborations in partnership with minority serving institutions.	Universities, funding agencies
Develop and provide astronomical information using multiple modes of access, with each mode being as accessible as possible.	Publishers, universities, departments, individuals
Make astronomical data, software, and publications open access.	Publishers, observatories, funding agencies, individuals
Long term goals/actions	**Target stakeholders**
Research and develop methods and assistive technology to make astronomy accessible to disabled students and astronomers.	Funding agencies, universities
Ensure that all facilities are 100% wheelchair accessible.	All institutions, government
Allow undocumented students access to undergraduate and graduate programs, and provide financial aid for these students.	Universities

Creating Inclusive Environments: Recommendations Summary Table

Context: It is essential that the places we work and interact are spaces that are inclusive of a broad range of ideas, identities and abilities. This includes the social ecosystem - eliminating discrimination and harassment and assuring inclusivity and healthy work-life balance - and the physical ecosystem - making sure all facilities are accessible to all people. An inclusive environment includes a framework for support, through mentoring, networking and education.

Core Recommendations:

1. **End harassment in and around astronomical workplaces.**
2. **Ensure access to quality, affordable health care.**
3. **Facilitate work-life balance, family friendly policies, and a welcoming environment.**
4. **Establish robust data collection and reporting to assess and monitor progress, and ensure that those procedures are inclusive.**
5. **Provide effective mentoring and networking opportunities.**
6. **Adopt teaching practices that support marginalized students.**

Because of the large number of specific, granular recommendations received in this area, the table below does not represent a prioritized or comprehensive summary of the recommendations but rather a representative preview of the full recommendations presented later in this report.

Examples: Short term goals/actions	**Target stakeholders**
Adopt and publicize clear anti-harassment policies and procedures, including highly transparent reporting avenues.	Universities; Departments, leadership, professional organizations
Facilitate name and gender changes on organizational records and establish a “preferred name” policy.	Universities, departments, leadership
Schedule conferences, seminars, and meetings at family-friendly times and be flexible when scheduling events.	Departments, leadership
Establish a student-centered matrix of support and mentoring for students and postdocs that does not rely solely on the advisor.	Universities
Establish an inclusive teaching practice by recognizing students' needs and resources (e.g., provide materials in multiple formats, accommodate personal conflicts).	Universities, departments, Instructors

Encourage and provide opportunities for instructors, potential instructors, and teaching assistants to learn new pedagogical and assessment techniques (i.e. workshops, mentoring for teaching)	Departments, professional societies, funding agencies(?)
Examples: Medium term goals/actions	**Target stakeholders**
Increase networking opportunities for minorities,other marginalized students, and early career professionals.	Professional societies
Establish identity support networks within and across STEM departments and connect to university-level resources.	Departments, Universities
Provide incentives and opportunities for instructors to adopt and develop research-based inclusive learning practices.	Departments, Universities, Professional societies
Assure that your classroom environment meets or exceeds ADA compliance. Work with students and abilities office to obtain and implement accommodations.	Universities, departments, instructors
Examples: Long term goals/actions	**Target stakeholders**
Develop and support astronomy education research groups who investigate teaching and learning in astronomy through the lens of inclusivity and intersectionality.	Universities, departments, leadership
Provide three to six months of paid parental leave at all career stages. Leave must include adoption and fostering, and must be available to parents who did not give birth. Create avenue for supplemental insurance fund to support family leave time for astronomers with insufficient benefits in their home institutions.	
Support astronomers from small institutions or non-academic organizations who may not have access to the same support network as those at larger institutions.	

Inclusion and Access to Power, Policy, and Leadership: Recommendations Summary Table

Context: An inclusive community requires inclusive leadership, with decision-making roles open and available to anyone interested in pursuing them. Informing the community of leadership opportunities, responsibilities and expectations, in addition to making leadership roles accessible, makes for both an inclusive culture and more effective leadership structures.

1. **Inclusive Diversity (gender, ethnic, racial, geographical, institutional, etc.) should be made a priority (not just a goal) in all areas of policy making and leadership roles throughout the astronomy community.**
2. **Future decadal surveys should address concerns of diversity in participation, leadership and policy making as part of recommended actions.**
3. **Funding (e.g., grants) should also be tied to metrics and progress on the inclusion of underrepresented, under-resourced and disenfranchised groups.**
4. **Astronomical researchers should acknowledge the responsibility to be 'good citizens' in areas where research intersects concerns in the larger society.**

Short term goals/actions	**Target stakeholders**
Increase equitable access to policy making and leadership roles; deliberately reach out to and involve individuals from across the entire astronomical community, especially underrepresented and under-resourced researchers and institutions, in policy and leadership roles.	Agencies, Universities, Individuals, professional associations
Astronomy communities should consider, develop, and test policies in mentorship/apprenticeship, graduate admissions, and hires that could have a positive effect on current diversity imbalances, and can become models of action for the decadal survey.	Individuals, Universities.
Funded policies that expand diversity in the field should be put in place and supported in the community.	Agencies, Universities, professional associations
Medium term goals/actions	**Target stakeholders**
Diversity (gender, ethnic, racial, geographical, institutional, etc.) is made a priority (not just a goal) on (e.g.,review, policy, hiring, etc.) panels and committees.	Agencies, Universities, Individuals, professional associations

Diversity and intersectional (i.e., gender + institutional, etc.) demographic data of committee and panel makeup, as well as for the larger community, are collected and reviewed for problems and progress.	Agencies, Universities, professional associations
The decadal survey should address issues of policy making and leadership diversity imbalances as recommendations that can be acted upon by policy makers.	Universities, Individuals
Breaches of ethics, be they conflict of interest, citations, data usage, bullying or harassment, are taken seriously and addressed within the astronomy community.	Agencies, Universities, Individuals, professional associations
Long term goals/actions	**Target stakeholders**
Departments, committees and science & policy panels that are representative of the astronomical community that they represent.	Agencies, Universities, Individuals, professional associations
Astronomical researchers recognize and acknowledge responsibility to be 'good citizens' in areas where their research interacts with concerns in the the larger society.	Individuals, agencies, Universities, professional associations
Funding of research (e.g., grants) is also tied to metrics on diversity and inclusion of underrepresented and disenfranchised groups.	Agencies, Universities, professional associations

Establishing a Community of Inclusive Practice: Recommendations Summary Table

Context: Developing and maintaining an inclusive community of astronomy requires a sustained practice of education, engagement and action, and hence establishing a community of inclusive practice. This includes understanding the history of oppression against marginalized groups in your culture, learning about best practices to discuss and confront discriminatory behavior, practicing active allyship, and establishing mechanisms of accountability. Establishing inclusivity plans for your organization is an example of inclusivity practice.

1. **Learn about the history of oppression against marginalized groups in your own culture and the culture you are in (they may not be the same).**
2. **Practice active allyship.**
3. **Learn and use best practices for discussing racism and its intersections.**
4. **Understand and reduce the negative impact of power imbalances.**
5. **Implement accountability practices, and respond promptly when astronomers engage in racism, sexism, heterosexism, cissexism, and ableism.**
6. **Perform self-audits on equity, inclusion, and accessibility and develop short-term and long-term institutional plans.**

Short term goals/actions:	**Target stakeholders**
Practice active allyship: Do not assume because you "want to" be an ally that you are. "Ally" is not a permanent designation.	Individual astronomers, leadership
Recognize there are multiple axes of identity. Different marginalized groups may need different forms of active allyship at different times.	Individual astronomers, leadership
Do your homework. Educate yourself on the extensive history of oppression against marginalized groups in your own culture and the culture you find yourself in.	Individual astronomers
Challenge harmful behaviors like harassment and microaggressions.	Individual astronomers, leadership
Act proactively as well as reactively. Do not wait for a problem to arise to attempt to fix it.	Individual astronomers, leadership, departments, universities, professional associations, policy makers, funding agencies
Engage movements of like-minded individuals at your institution, in your community and online. Research thoroughly before creating new groups to avoid erasure of previous efforts.	Individual astronomers

Medium term goals:	**Target stakeholders**
Learn and use best practices for discussing racism and its intersections.	
Reduce the negative impact of power imbalances in a given situation.	Individual astronomers, leadership
Speak to your own experience.	Individual astronomers
Use “both/and” rather than “either/or” thinking to allow space for the development of more options.	Individual astronomers, leadership
Use inclusive language.	Individual astronomers
Recognize that intent does not equal impact.	Individual astronomers, leadership
Allow space for unexpected responses.	Individual astronomers
Lean into discomfort.	Individual astronomers
Respond constructively when someone tells you that your words and actions are harmful to others.	Individual astronomers, leadership
Long-term goals	**Target stakeholders**
Implement accountability procedures.	
Develop long-term institutional plans for equity and inclusion, which should be public and include annual progress reports on organizational accessibility.	Universities, departments, public and private research organizations, funding agencies
Respond promptly when astronomers publicly engage in racism, sexism, heterosexism, cissexism, and/or ableism.	Professional organizations, leadership, individuals
Host departmental site visits that gauge the climate for people with one or more marginalized identities.	Departments, public and private research organizations
Perform accessibility self-audits. Develop short-term and long-term plans to make institutions accessible.	Universities, departments

1. Removing Barriers to Access

Eliminate practices in college and graduate school recruitment, admissions, examinations and advising that are unfairly discriminatory.

Several aspects of admissions are known to differentially select groups based on criteria other than scholastic/research ability. Implicit biases linked to standardized testing, letter writing/reading, admissions committee composition, and the costs of graduate applications are known to play a role in excluding qualified students from graduate programs. Admissions policies and practices that address and remove barriers are essential for training a diverse workforce.

Specific recommendations:

- Develop and deploy tools for best practices for reviewing applications holistically and equitably.
    - Eliminate or make optional the General and/or Physics Graduate Record Exams (GRE) as a requirement for graduate school admission. Never require minimum GRE scores for admission to a program. See the AAS statement of endorsement, which includes a complete description of the scholarly background for this recommendation and concrete examples of alternative metrics (see also below). [LEAD] [DEP] [UNI] [PRO] <short>
    - Integrate evaluation of grit and persistence through interview as part of graduate admissions procedure (example evaluations from Fisk-Vanderbilt toolkit: http://fisk-vanderbilt-bridge.org/tool-kit/) [LEAD] [DEP] [UNI] <short>
    - Remove or reduce financial barriers to graduate school application by eliminating or refunding application fees and allowing the reporting of unofficial transcripts and exam scores. [LEAD] [DEP] [UNI] <short>
    - Quantitatively evaluate selection processes for inherent demographic biases and identify and make use of best practices to address them. [LEAD] [DEP] [UNI] [PRO] <medium>
    - Train faculty in appropriate interviewing strategies, possibly partnering with campus resources (e.g., alumnae/i, admissions office, etc.). This might include development of a presentation on current research on admissions discrimination, sharing of best practices, research-based rubrics, etc. [DEP] [UNI] [PRO] <short>
    - Establish clear rubrics for admissions evaluations before applications are received, and adhere to these rubrics through the admissions process (see the Fisk-Vanderbilt Bridge Program toolkit for example protocols and rubrics). [DEP] [UNI] <short>
- Work with and implement bridge programs (e.g., Fisk-Vanderbilt Master's-to-PhD Bridge Program, Columbia Bridge to the PhD Program), particularly in partnership with minority serving institutions, to facilitate student application and transition to graduate programs, and make sure these programs have sufficient resources to assure student success for

a period longer than one summer. [IND] [LEAD] [DEP] [UNI] [MSI] [MAJ] [PRO] [FA] <short>

- Remove barriers that unfairly exclude undocumented students. Provide as much access as possible to undergraduate and graduate education, including financial aid, scholarships, in-state tuition, and research opportunities. [DEP] [UNI] <medium>

Eliminate practices in hiring and promotion that are known to be unfairly discriminatory.

Maintaining a pipeline for career progress for all astronomers necessitates identifying and eliminating discriminatory hiring and promotion practices. Examples include unconscious bias in letter writing and evaluation, monolithic hiring/promotion committees, favoring extroverted over introverted behaviors, and insular practices (e.g., only considering letters from known writers, or candidates from majority white institutions).

Specific recommendations:

- Develop clear criteria for candidate evaluation before seeking applications, make these criteria known to applicants, and apply these criteria consistently for all applicants; this includes "minimum" requirements, such as minimum number of letters expected. [IND] [LEAD] [DEP] [GOVT] [COR] [POL] <short>
    - Make hires in broad areas of research topics
    - Develop a common application service for job applications to reduce workload on applicants (but make sure format is equitable and accessible)
- Eliminate discriminatory student, researcher and educator evaluation practices. [DEP] [UNI] [GOVT] [PRO] <medium>
    - De-emphasize traditional student-generated teaching evaluations as a primary criterion for performance evaluations, raises, promotion, and tenure, as these have been shown to be biased against women and people of color[28]
    - De-emphasize use of individual publication metrics (e.g., h-index) for hiring and promotion, as they have been shown to be biased against women[29] and early-career minorities.[30] When evaluating personnel, take into account the significant extra work that people with one or more marginalized identities often put into mentoring, community organizing and community service, that is often above and beyond the work done by those from majority groups.

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[28] Lillian MacNell, Adam Driscoll and Andrea N. Hunt. "What's in a Name: Exposing Gender Bias in Student Ratings of Teaching" Innovative Higher Education, 2014

[29] Clint D. Kelly and Michael Jennions "The h index and career assessment by numbers" Trends in Ecology and Evolution, 21, 4 (2006); Lisa Geraci, Steve Balsis, and Alexander J. Busch Busch "Gender and the h index in psychology" Scientometrics, 105, 2023 (2015)

[30] Joseph Price and Joshua Price "Citizenship, gender, and racial differences in the publishing success of graduate student and young academics" [Electronic version]. Retrieved 18 December 2015, from Cornell University, School of Industrial and Labor Relations site: http://digitalcommons.ilr.cornell.edu/workingpapers/145/

Make astronomy accessible to all.

Accessibility for disabled people is a human right. Lack of accessibility constitutes discrimination in and of itself. At present, there exist significant barriers to access for disabled students and astronomers. These ableist barriers show up via building infrastructure, educational practices, limitations in technology, institutional apathy, and culture within the astronomical community. Accessibility must go beyond simple adherence to legal guidelines such as the Americans with Disabilities Act (ADA) in order to be truly inclusive. Because access needs vary significantly, we must provide multimodal access. When enacting these recommendations, it is important to recognize that the best advocates for disabled people are disabled people (e.g., L. Brown 2015).

Specific recommendations:

- Make astronomical facilities fully accessible. [GOVT] [UNI] <long>
    - Meet or exceed the minimum legal requirements for accessibility. Make buildings (including laboratories, classrooms, and observing facilities) fully wheelchair accessible. Make accessibility the top infrastructure priority. Do not hold classes or events in inaccessible spaces. [GOVT] [UNI] <long>
    - Ensure that the faculty, institutional leadership, and building managers are fully cognizant of both legal guidelines and best practices on accessibility through mandatory trainings. Make sure that accessibility is not the responsibility of a single person at an institute. [UNI] [GOVT] <short>
    - Provide all-gender, accessible restrooms in any new construction or renovation. Make sure both men's and women's restrooms are present on every floor. Convert existing single-stall bathrooms to all-gender bathrooms (e.g., by changing the sign). [DEP] [UNI] [GOVT] [COR] <short> <long>
- Make educational resources and research products fully accessible.
    - Design reference materials such as websites, journal articles, books, and other documents to be fully accessible with screen reader technology, including math and descriptions of graphics. [PUB] [DEP] [UNI] [GOVT] <medium>
    - Use dyslexic friendly sans serif fonts such as Helvetica, Verdana, Arial, and Dyslexie with at least a 12 pt font size. Provide documents in an electronic format that allows font substitution and is compatible with screen readers. [PUB] [DEP] [UNI] [GOVT] <medium>
    - Design figures, diagrams, and text to be readable by people who are colorblind, using specifically designed color palettes (click here for an example). [IND] [LEAD] [PRO] [PUB] <short>
- Plan conferences using the principles of universal design and disability justice.
    - Consider accessibility at all stages of the planning process by providing accessibility information and accommodations for attendees and presenters, and providing access to electronic conference materials including presentations.

Describe accessibility barriers. Have an accessibility point person or committee. [IND] [LEAD] [PRO] <short>
    - When presenting, speak loudly while facing the audience. Use a microphone if available, even if you have a loud voice. Use simple language, and avoid idioms and unnecessary jargon. Describe slide contents, including charts, plots, and graphics. Allow time to process information. Make screen reader accessible copies of the presentation slides available in advance. [IND] <short>
    - Practice accessibility as a conference attendee by maintaining clear paths, reserving seating in the front row and by aisles and exits for people who need it, and remembering that not all disabilities are visible. [IND] <short>
    - After the meeting, provide videos and presentations in electronic form. Record and disseminate conference talks and presentations and ensure the use of captions and transcripts. [PRO] [UNI] [GOVT] <short>
    - Provide a funding pool for students and young researchers to attend conferences, workshops, observing trips, etc., which allows for payment in advance without the use of credit cards/other debt instruments. [PRO] [FA] <short>
- Fund accessibility initiatives in astronomy.
    - Support research into the use of technology such as 3D printing to make astronomical teaching and outreach broadly accessible. [FA] <long>
    - Support research into accessibility in educational and research methods and assistive technologies (such as sonification of data). [IND] [LEAD] [UNI] [GOVT] [PRO] [FA] <medium>
    - Fund and provide ample research opportunities (including undergraduate internships, thesis projects, postdoctoral opportunities, faculty, and research positions) for disabled students and astronomers. Actively counter discrimination in admissions and hiring. [FA] [UNI] <medium>
- Foster a community that supports disabled students and astronomers.
    - Professional organizations such as AAS should create committees on disability justice and accessibility that take an intersectional approach. [IND] [LEAD] [PRO] <short>
    - Eliminate stigmas associated with disability and mental health by using inclusive rather than ableist language and attitudes (as an example, see http://www.autistichoya.com/p/ableist-words-and-terms-to-avoid.html)

Increase open access to astronomical publications, data, and software.

A large fraction of astronomical research products remain behind barriers such as paywalls and closed data policies. These barriers disproportionately impact smaller and less well-funded institutions who are less able to afford subscriptions to research journals and licenses for software. Open access policies will eliminate this barrier to access while simultaneously providing for wider dissemination of research and greater scientific returns on each investment.

Specific recommendations:

- Establish open access policies for astronomical publications and individual published work. [LEAD] [UNI] [COR] [GOVT] [PRO] [POL] [PUB] <short> <medium>
- Disseminate research through open access platforms. [IND] [PUB] <short>
- Prioritize and support the development of astronomical software (such as Astropy and MESA) that is open, freely available, well-documented, and easy to use [IND] [PRO] <short> <medium>
- Provide access to supercomputing resources, and allow young astronomers "proof of concept" opportunities to establish new programs. [UNI] [GOVT] <medium>
- Expand access to astronomical educational materials that are freely available and of high quality [PUB] [PRO] <medium>
    - Support the development of open access educational resources (textbooks, websites) https://openstaxcollege.org/textbooks/college-physics

2. Creating Inclusive Environments

End harassment in and around astronomical workplaces.

Astronomers have the right to work in places that are free of harassment. This includes sexual harassment, racial harassment, harassment based on real or perceived gender identity or sexual orientation, ableist harassment, physical harassment, verbal harassment, and bullying. Because of intersectionality, these different forms of harassment often occur simultaneously. Power dynamics are also a vital aspect of harassment and bullying, and must be acknowledged and taken into account when developing anti-harassment policies to ensure that those in positions of relatively little power, such as undergraduates, graduate students, postdocs, staff, and junior faculty can report harassment by their superiors safely and without fear of reprisal.

Specific recommendations:

- Enact and disseminate clear anti-harassment policies and procedures. Departments and institutions should every year publicly review the reporting mechanisms for sexual harassment and assault. [UNI] [COR] [GOVT] [PRO] [POL] <short> <medium>
- Work to create an institutional culture where harassment is not tolerated and is actively challenged. [IND] [LEAD] [UNI] [GOVT] [COR] <medium> <long>
- Hold annual, mandatory departmental and/or institutional anti-harassment trainings. These trainings should include bystander intervention techniques, best practices for responding to harassment complaints, institutional policies and resources, and content relevant to the (astronomical) workplace. [LEAD] [UNI] [COR] [GOVT] <short> <medium>
- Implement departmental and institutional trainings on diversity, equity, and inclusion. Include training around privilege, gender, race, LGBTIQA* Safe Zone, and disabilities and ADA compliance. Training should focus not only on the legal definition of harassment, but how to prevent the many stages of inappropriate behaviour that does not cross the legal line. Involve trained professionals in these trainings where possible.
- Conferences or other organized professional events should have a clear anti-harassment policy, and identify one or more points of contact to whom harassment complaints may be submitted and followed up on in a timely manner. [IND] [LEAD] [UNI] [PRO] <short>
- Adhere to Title IX anti-discrimination policies on recruitment, admissions, counseling, financial assistance, sex-based harassment, treatment of pregnant and parenting students, discipline, employment and retaliation for any recipients of federal financial assistance from the US Department of Education; see http://www2.ed.gov/about/offices/list/ocr/docs/tix_dis.html [IND] [LEAD] [UNI] [GOVT] [COR] [PRO] <short>
- Departments and institutions must hold serial harassers and bullies accountable for their actions, including through termination of employment. People who have demonstrated

an established pattern of abusive behavior should never be allowed to be in a position of power or authority over others.
- Funding agencies should develop policies for sanctioning institutions that do not follow guidelines on dealing with harassment or abuse of power.
- Establish a confidential Ombuds office to provide advice to people who are considering whether or not to make a report. [UNI] [GOVT] <medium>

Review data collection, reporting, and records policies to ensure they are inclusive

Data collection forms, reporting, and records can be fraught with unintentionally offensive language and response options. All forms should be reviewed with the understanding that many people do not fit into the gender binary, or into the standard "categories" asking about race. Records should also be made flexible to enable gender and name changes on request.

- Ensure that all demographics questions are at the end of surveys to avoid stereotype threat.
- Review all surveys and forms asking for gender and ascertain whether this information is really needed. If not, take out the question; if required, use a write-in box, rather than asking people to identify as M/F
- Review questions asking about race to ascertain whether this information is really needed. If so, allow individuals to identify as more than one race: allow people to "check all that apply" or provide a write-in box. Consider disaggregating racial/ethnic groups.
- Add questions asking about LGBTIQA* identity unless such information would put respondents at risk (e.g. in states with no workplace protections). We currently have virtually no data on LGBTIQA* status of scientists, and these data are vital for improving services for the community.
- Include disability categories in data collection and reporting, using the terminology and identities used by people with disabilities.
- Use gender-neutral and inclusive language in all publications.
- Establish a "preferred name" policy that allows students to register a preferred name alongside their legal name. Ensure that the preferred name list is the one used within the department.
- Facilitate name and gender changes on organizational records, and ensure that such changes are retroactive and confidential. Such changes should not be contingent on "proof," such as doctors' notes, or changes on legal documents such as birth certificates, passports, or driver's licenses. Such "proof" is expensive to obtain and therefore excludes many transgender students.

Enact policies that are friendly to all families.

Institutions have the responsibility to enact family friendly policies. These policies should specifically include LGBTIQA* families and non-traditional family structures. Family friendly policies should extend to all career stages, including undergraduates, graduate students, postdoctoral researchers, staff, and faculty.

Specific recommendations:

- Develop mechanisms to facilitate geographic proximity for dual career academic couples, e.g., establishing dual career hiring protocols in partnership with local institutions, making dual/group/cohort hires, shared faculty positions, etc.
- Provide mechanisms for astronomers who take time off for family, health, or other reasons to return to the field. Ensure that such mechanisms are available at all career stages and transition points.
- Provide three to six months of paid parental leave at all career stages and for all partners that includes adoption and LGBTIQA* couples. <long>
- Establish policies allowing paid leave or part-time leave for elder care for all career levels.
- Establish a AAS/NSF/home institution supplemental insurance fund to support family leave time for astronomers with insufficient benefits in their home institutions. <long>
- Ensure access to affordable, quality childcare. The childcare should be conveniently located (e.g., with options on campus) and not require excessive waits. <med>
- Provide childcare subsidies, especially to early career students and scientists.
- Provide conveniently located, accessible lactation rooms at all institutions and conferences. Provide dedicated refrigerators for storing breast milk separately from employee food, either in lactations rooms or in employees' offices
- Schedule events at times that accommodate people with families. Conferences should not be scheduled on weekends or holidays, and seminars and meetings should not be scheduled after 4 pm. Be flexible when scheduling events. <short>
- Allow junior scientists to stop the tenure/short-term position clock and provide extensions of deadlines after birth/adoption, serious injury, mental health issues, and/or care for a family member.
- Provide and better advertise the existence of telecommuting options for students, researchers, faculty and staff.
- Facilitate methods by which students and researchers can remain at the same location throughout various career stages.

Ensure access to quality, affordable health care.

Health care should be easily accessible to astronomers at all educational and career stages. Health care that is poor quality, prohibitively expensive, or contains exclusions for LGBTIQA* health limits the ability of astronomers to perform at their highest potential.

Specific recommendations:

- Ensure that the health care is affordable. Provide plans with low co-pays and deductibles, especially for students and early career scientists. If co-pays are high, create departmental or institutional funds to support students who need it.

- Provide sufficient sick leave. Allow sick leave to be taken to care for family members and to be used for mental health.
- Provide health insurance plans that specifically cover transgender health care (including but not limited to hormonal treatment, gender confirmation surgery, and counseling), same-sex-couples, domestic partners, and dependents. These plans should include mental health, dental, vision, and reproductive health care.
- Ensure that University Health Center counselors are trained in supporting LGBTIQA* students, and advertise this fact on the counseling center website.

Facilitate a welcoming environment for all that values work-life balance and a collegial atmosphere

Productive, creative, and sustained research requires an environment where everyone feels welcome and valued, including a robust work-life balance. Research shows that refusing to talk about identity, equity and inclusion is harmful to underrepresented students, who struggle with these social aspects of the scientific workplace. Talking about these issues can ensure that students feel more supported.

Specific recommendations:

- Make discussions about diversity, equity and inclusion part of the departmental discourse. Set up a journal club to discuss articles, and establish a diversity seminar series. Openly discuss identity, equity, and inclusion with students and postdocs.
- Establish clear and reasonable expectations for work effort and work-life balance (e.g., number of hours of lab time or work time expected). Everyone (students, postdocs, faculty, administrators) should support and adhere to these expectations.
- Change the work culture to value mental health: talk openly with students and postdocs about mental health, and ensure that mental health services are advertised widely and openly in the department materials and bulletin spaces.
- Honor group and collaborative accomplishments in the same manner as individual accomplishments.
- Specifically invite everyone to department-sponsored social events.
- When food is provided at events, ensure that there are gluten-free, halal, kosher, vegan, diabetic-friendly, and allergen-free options, with ingredients listed. Ensure that vegetarian and vegan options include protein and that gluten-free vegetarian options are available.
- Do not schedule conferences, exams, or proposal deadlines on religious holidays.
- Have a clear policy on offensive language.
- Use gender-neutral and inclusive language in all publications.

Provide effective mentoring and networking opportunities.

Inclusive support of all astronomers requires robust networks of peers, mentors and advocates. Student-advisor, mentee-mentor and employee-employer relationships are among of the most important in a young scientist's career. However, these relationships can fail for a variety of reasons. Clear, non-stigmatized pathways for changing groups/advisors, having independent and senior advocates of students and postdocs, and developing community-based mentor networks are ways to prevent scientists from being derailed in their career progression. Additionally, realize that astronomers from small institutions or non-academic organizations may not have access to the same support network, and additional effort should be made to support them.

Specific recommendations:

- Establish a matrix of support for individual students and postdocs that does not rely solely on the advisor. This may be a formal network established by the department or institution, or an informal network endorsed by organizational leaders. Make sure there is both time and funding available for mentoring activities.
- Follow the leads of HBCUs/MSIs/Community Colleges in establishing student-centered mentoring practices:
    - Faculty and department leaders should consult with admissions and freshman advisors to identify and start advising potential astronomy/physics majors early on, especially underrepresented students.
    - Provide support, mentorship, and research opportunities.
    - Require faculty training on best practices in advising students and postdocs, including issues particular to underrepresented/LGBTIQA*/disabled students.
    - Proactively engage and mentor transfer students, many of whom come from minority-serving institutions.
- Establish a mentoring ladder to spans multiple career stages; e.g., graduate mentors of undergraduates, postdoc mentors of graduate students, junior faculty mentors of postdocs, senior faculty mentors of junior faculty, etc.
- Establish identity support networks within and across STEM departments; and establish, support and make people aware of university-level resource centers for marginalized communities (e.g., Black Resource Center, Queer Resource Center, DREAMer Alliance etc.).
- Increase networking opportunities for minorities and other disadvantaged students, and early career professionals within departments, at conferences, exchange programs, etc. Examples include the CSMA "Meet and Greet" reception at AAS meeting, travelling speaking grants (e.g., the NSBP/AAS Beth Brown Prize and the AAS FAMOUS travel grants).
- Provide junior faculty with senior faculty mentors in the department who can guide them through the culture, responsibilities and expectations within the department (funding, tenure, students, navigating administration, etc.), and who can act as an advocate.

- Support mid-career faculty/scientist mentoring and career coaching through national programs (e.g., Project Kaleidoscope, National Center for Faculty Development and Diversity).
- Support astronomers from small institutions or non-academic organizations who may not have access to the same support network as those at larger institutions.

Adopt active and inclusive learning practices.

The foundation of a successful career in Astronomy is educational opportunity. Students from minority/marginalized groups often experience classroom environments and dynamics differently than people from majority groups, and in ways that may reduce the effectiveness of teaching. Adopting research-validated practices and principles of inclusive design can eliminate barriers to learning and biases in assessment, making educational opportunity available to all.

Specific recommendations:

- Meet and exceed ADA requirements for accommodations in the classroom:
    - Include explicit wording in syllabi outlining your commitment to extend reasonable accommodations to all students with disabilities, whether visible or invisible.
    - Know what accommodations are permitted by your campus' Disabilities Office, and assure that students are receiving these accommodations in the classroom.
    - Work with students who are in the process of obtaining accommodations to complete paperwork, and work with your campus's Disabilities Office to recognize and reduce barriers for students seeking accommodations.
    - Make available testing environments free from distraction, and provide extra time (without judgment) for those who need it.
    - Provide resources to faculty so that class notes and other teaching materials can be made available in multiple formats (audio, visual, captioned video, etc.).
    - Provide students with spaces to move as needed; allow students free access to come in and out of class.
    - If attendance is required, allow students a well-defined leeway in arrival/departure times, particularly for those with disabilities and when teaching on large campuses.
    - Make sure class activities are fully accessible; if they are site-specific (e.g., observatory, planetarium), assure full access to disabled students; if they are at night, assure there are escorts available or on call.
- Classroom participation and dynamics:
    - Highlight the scientific contributions of a variety of astronomers, not just those who are white, male, able-bodied and heteronormative.
    - Be aware of who you are calling on for questions and answers; avoid choosing one demographic group over another (e.g., only the men) or focusing on one

section of the room (e.g., only the front). One way to achieve this is to wait until at least three students have raised their hands.
    - Be aware of and refrain from using racist, sexist, ableist, gender-discriminatory or homophobic language in the classroom; if such language is part of the instructional material (which should be rare in an Astronomy course), give students trigger warnings.
    - Pay attention to the classroom climate, and address discriminatory behavior promptly and respectfully; it is often helpful to have student representatives available for reporting.
    - Recognize that a “no-device” policy may inhibit the learning of some students; consider best practices such as separate seating areas in class for students who require devices versus students who find devices distracting.
    - Make clear policies on accommodation for students who have conflicts due to religious practice, medical treatment, family and/or personal emergencies.
    - Beware of organizing off-schedule activities that might exclude some students. For example, review sessions at unscheduled times might be difficult for students who have to work and/or commute via public transportation. (Commuting at odd times is particularly challenging for undocumented students, for whom obtaining a driver's license is extremely difficult in some states.)
- Know what strengths, weaknesses, needs, and resources your students bring to the classroom, and adopt appropriate teaching and assessment strategies:
    - Consider including diagnostic tests at the beginning of the course to identify what students’ skills are coming into the course; design your teaching based on what the students know, not what you assume they should know.
    - Diversifying your instruction techniques and resources can significantly improve inclusion; get to know your students and what works best for each of them.
    - When implementing interactive teaching methods, make sure that students who do not want to participate (e.g., introverts, those with social phobias) are not forced to do so.
    - Recognize that not all students have access to technology (e.g., their own laptops, calculators, clickers) and strive to eliminate technology barriers.
    - Foster a growth mindset in your students.
- Work to create a thriving, inclusive teaching environment by continually maintaining and improving your undergraduate program, which is necessary but not sufficient for attracting and retaining marginalized students:
    - Provide opportunities (i.e. workshops, mentoring for teaching) and incentives (e.g. grants, recognition, etc.) for instructors, potential instructors, and teaching assistants to learn new pedagogical techniques and to adopt and develop research-based inclusive learning practices.
    - Work with professional education researchers (e.g. university’s center for learning, hiring astronomy education researchers) to evaluate and improve instruction in your department.

- Develop and support astronomy education research groups who investigate teaching and learning in astronomy through the lens of inclusivity and intersectionality.

3. Inclusion and Access to Power, Policy, and Leadership

Provide clear and accessible information about the process and procedures to obtain leadership roles in policy making.

An inclusive community requires inclusive leadership, with decision-making roles open and available to anyone interested in pursuing them. Informing the community of leadership opportunities, responsibilities and expectations, in addition to making leadership roles accessible makes for both an inclusive culture and more effective leadership structures.

Specific recommendations to the astronomy community:

- Provide access to meaningful leadership opportunities for, especially early & mid-career, astronomers who are at all types of institutions and in particular, those at smaller institutions and outside academia.
- Provide an updated and widely-available list of the types of leadership roles available, information on what career stage they are generally held, and how they are filled (volunteer, appointment, election).
- Make the selection of astronomical community leaders a transparent process. Information that allows people to understand the policies and procedures of elections or appointments will enable questioning that can lead to a stronger process.
- Increase transparency in decision making for organizations by making committee meetings and detailed meeting notes publicly accessible, accommodating participants who cannot be physically present, and widely disseminating information about decisions made.
- Establish clear, broad and fair criteria that promote diversity in election slates and appointments as well as awards and recognition.
- Lines of accountability for the execution of policies and procedures should be established and publicly disseminated.

Ensure that science and policy panels and committees are representative of the communities they are representing.

Decisions about the future of the field of astronomy are often made by high level panels such as the decadal review committee. To ensure that decisions are fair and inclusive, it is essential that they be made by people who are able to represent the interests of the field as a whole.

Specific recommendations:

- Adopt recommended good practices for the selection of committee/panel members, an example is the Inclusive Astronomy 2015 : Policy Power and Leadership Toolkit item “Suggested good practices for committee member recruitment”.
- In particular, agencies (e.g., NSF, NASA, DOE) and other policy advisory groups (e.g., NRC) must strive to make prominent national panels (e.g., NASA Senior Review, NRC

Decadal Review) diverse and inclusive (i.e., not all-white, all-male, from all the same kind of institution, etc.). Procedures and policies for selection on these panels should be regularly included in external reviews of agencies and groups.
- Adopt recommended good practices for effective and respectful communication within committees.

Practice respect for the rights and cultural values of Native and indigenous peoples and local communities when building or locating astronomical facilities.

Astronomical research often requires facilities in remote areas, which may be sacred sites for Native and indigenous peoples. Astronomers and their representatives should engage in consensus processes with the relevant indigenous and local communities and governmental bodies when locating facilities. Consensus almost never means unanimity, but in most consensus processes there are agreed upon rules for what ultimately constitutes consensus.

Specific recommendations:

- The astronomical community should require evidence of consensus between the facilities project, the relevant governmental agency and the affected local communities before supporting astronomical projects.
- The astronomical community must provide a safe environment for students and scientists, especially those who are Native, indigenous, of color, and/or junior, to critique or protest the cultural costs of astronomical developments without fear of retaliation.
- Site selection processes should be transparent, lawful and provide multiple opportunities for local communities to comment and critique the cultural, environmental, and other impacts of proposed plans.
- Once land use agreements have been made, astronomers must fully abide by these agreements, the laws covering them and should provide appropriate and fair compensation as determined by the consensus agreement.
- Astronomers should be encouraged to learn about the long-term history, use and cultural significance of the land on which astronomical facilities reside.

4. Establishing a Community of Inclusive Practice

Practice active allyship.

Allyship is a process by which people who are empowered along one or more axes of identity actively work to support people who are disempowered along those axes. Traditionally, disempowered and/or marginalized identities include (but are not limited to) women, people of color, LGBTIQA* people, and disabled people. However, people who share more than one of these identities, i.e. those with intersectional identities, are often severely underrepresented and overlooked in these interventions. Active allyship, in the form of tangible, systematic behaviors on behalf of individuals in these communities, is vital to the present and future equity and inclusion in astronomy.

Specific recommendations:

- Do not assume that because you *want to* be an ally that you are. The people with whom you wish to act determine whether or not you are acting as their ally at a particular time. “Ally” is not a permanent designation. [IND] [LEAD] <short>
- Recognize that there are multiple axes of identity. It is therefore not likely that one can serve as an active ally to all identities and intersections thereof at all times. Different marginalized groups may need different forms of active allyship at different times. Recognize and respect these distinctions. [IND][LEAD] <short>
- Do your homework. Learn to recognize what harmful and hurtful behaviors, language, and policies are from people who have experienced them. Educate yourself on the extensive history and current manifestations of racism, sexism, heterosexism, cissexism, ableism, and their intersections. Use resources that have been developed by people with marginalized identities. Check in regularly with the group with whom you wish to act as an ally. [IND] <short>
- Challenge harmful behaviors like harassment and microaggressions. Bystander intervention strategies include pulling the victim aside and offering support, pulling the perpetrator aside and having a conversation, deflecting by changing the subject or making a joke, and confronting directly by calling out the behavior or calling in the perpetrator. [IND] [LEAD]<short>
- Act proactively as well as reactively. Do not wait until a problem arises to attempt to fix it. Try to anticipate where differences in ability or identity may result in barriers to access and attempt to empathize. Ensure that supportive policies, infrastructure, and culture are in place before they are necessary. [IND] [LEAD] [DEP] [UNI] [PRO] [PUB] [POL] [FA] <short> <med>
- Engage with movements of like-minded individuals at your institution, in your community, or online. Be sure to thoroughly investigate the existence of such advocacy groups before creating new ones to avoid redundancy and erasure of previous efforts by others. [IND] [SJ] <short> <med>

- Work to make your professional culture more inclusive by implementing the recommendations in this document. Use them to suggest specific policy changes in group meetings, department sessions, planning committees, etc. [IND] [LEAD] [DEP] [UNI] <med>

Learn and use best practices for discussing racism and its intersections.

The astronomical community vitally needs to challenge racism, sexism, heterosexism, cissexism, and ableism in our field. These conversations are difficult (and often uncomfortable), but are necessary to break down barriers of access and transform astronomy's culture to become actively inclusive. The following are an evolving set of best practices for having these difficult conversations. Any implementation of these practices must take into account the significant power differences that often exist between those who are white, cisgender, straight, able-bodied, neurotypical, senior, and/or male and those who are not. It is especially important for those who are on the empowered end of these axes of identity to actively put these recommendations into practice.

Specific recommendations:

- Reduce the negative impact of power imbalances in a given situation. Speak up when these dynamics are being misused and amplify the voices of those who are less empowered. Recognize that these power imbalances are amplified for people with intersectional identities. [IND][LEAD] <short><med>
- Facilitate balanced conversations. Agree before meetings and gatherings to amplify less pronounced voices, to make it safer for those who may not be actively contributing. [IND] [LEAD] <short>
- Don't dominate conversations. Be aware of when you might be participating disproportionately, and pull back so that others may contribute. [IND] [LEAD] <short>
- Speak to your own experience. Use "I" or "we" statements to help avoid generalizations. Do not assume that you understand oppression(s) better than people that have directly experienced and described it themselves. Acknowledge your privilege(s) and how that might impact your perspective on a given matter. [IND][LEAD] <short>
- Use "both/and" rather than "either/or" thinking. When confronting complex issues, "either/or" thinking often oversimplifies situations and makes it more difficult to resolve conflicts. "Both/and" thinking often allows us to come up with more options and to recognize the multifaceted nature of our experiences. [IND][LEAD] <short>
- Use inclusive language. Take the time to learn from potentially impacted communities which commonly used expressions are the source of microaggressions. Replace them with less exclusive alternatives. [IND][LEAD] <short>
- Recognize that intent does not equal impact.[31] Sometimes in conversations, we can inadvertently say hurtful things despite our good intentions. To foster mutual respect

[31] Gottman, J, Notarius, C, Markman, H., Bank, C,Yoppi, B., & Rubin, M. E. (1976) . Behavior exchange theory and marital decision making. Journal of Personality and Social Psychology, 34, 14

among participants, it is imperative that instead of appealing only to our initial intent, we acknowledge the potentially harmful impact on others. [IND][LEAD] <short>

- Learn strategies to support survivors of abusive behaviors such as harassment or bullying. Acknowledge the validity of a person's anger, fear, frustration, resentment, or other feelings about being a recipient of any combination of racism, sexism, cissexism, heterosexism, ableism, or other forms of oppression. Allow space for unexpected responses because individuals process their emotions differently. It is not always necessary to respond when someone shares their feelings. Do not tell the survivor what to do, but offer suggestions if they would like them. Do not question the validity of the survivor's claims or excuse the actions of the perpetrator. [IND] <short>
- Lean into discomfort. Discussions about privilege and discrimination often require us to examine issues that we do not want to talk about. However, we often make the most progress by contending with this discomfort so that we are able to take responsibility for our privileges and complicities, and effect positive change. At the same time, we must prioritize the safety of those of us with marginalized identities. [IND] <short>
- Respond constructively when you are "called out." Calling someone out makes space for those of us who have been harmed by language or behaviors to directly (and publicly) confront the offender. Recognize that calling someone else out is extremely difficult and risky, especially when there are power imbalances. Acknowledge the harm that was caused, state actions you will take to prevent causing similar harm in the future, and thank them for taking the time and effort to call you out. [IND] <short>

Implement accountability procedures.

As the astronomical community works toward equity and inclusion, it is essential to perform regular, public evaluations and receive critical feedback to ensure that our efforts are in the best interests of all members of our community, with special attention paid to those with marginalized identities.

Specific recommendations:

- Develop long-term institutional plans for equity and inclusion, and issue annual progress reports, that describe setbacks, challenges, new opportunities, and next steps to take for the following year. Provide an opportunity for members of the institution (in particular people with marginalized identities) to review the plans as they are being drafted, and ensure that these documents are archived on the institutional website. [LEAD] <medium>
- Respond promptly when astronomers publicly engage in racism, sexism, heterosexism, cissexism, and/or ableism. The leadership of organizations (such as research groups, departments, institutions, and professional societies) must speak up in support of the impacted groups in clear and unequivocal terms. [LEAD] [DEP] [UNI] [PRO] <short>
- Host departmental site visits during which an external committee gauges the climate for people with marginalized identities, and provides recommendations on how to improve the climate. Ensure that the site visits account for intersectionality and specifically

address the climate for people with multiple marginalized identities. Site visit programs that focus on a single dimension of identity should form partnerships with other groups to ensure that women, people of color, disabled people, LGBTIQA* people, and everyone with more than one of those identities are included. Site visit programs currently in existence include those by the APS Committee on the Status of Women, the APS Committee on Minorities, and the AAS Committee on the Status of Women in Astronomy. [DEP] <med>

- Create and highly publicize a robust reporting procedure to address all relevant dimensions of identity and social experience. Survey and report on the social experiences of the members of the department or institution regularly.
- Provide oversight mechanisms for people in positions of institutional power to reduce the likelihood of abuses of power.
- Ensure balanced involvement in the conceptualization, development and participation in conferences, colloquia, seminars, visiting appointments, and any other convenings. Track the demographics of organizers, invited speakers, awardees, hired staff, postdocs and students to determine if people with marginalized identities are being fairly represented, as compared to their proportion of the U.S. (or relevant national) population. [DEP] <medium>
- Appoint trained ombudspersons that members of an institution may approach to handle harassment, assault, and other legal violations of civil rights. [DEP] [UNI] <short>
- Perform accessibility self-audits. Document accessibility barriers, including but not limited to legal requirements. Allow members of the institution to provide input. Use the report to develop short-term and long-term accessibility plans. Make annual reports on progress toward accessibility. Publicize all reports and plans on the institutional website, including accessibility information and a list of accessibility barriers. [DEP] [UNI] <short> <medium> <long>
- Institute regular inclusion and accessibility meetings. At least once per semester, convene department meetings (preferably with the chair and/or other administrative authorities) to review reporting mechanisms for any inappropriate behavior or other issues and to allow members of the department to identify and propose action on these issues. These conversations should be open to all department members, with a separate confidential means of sharing the same information, if desired. [DEP] [UNI] <short>

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Additional Resources

Policy Recommendations and Best Practices

- Women of Color in Astronomy and Astrophysics
- Baltimore Charter
- Pasadena Recommendations
- *Presumed Incompetent* has a detailed set of recommendations in one of the final chapters
- Supporting LGBT+ Physicists and Astronomers: Best Practices for Academic Departments (Suggestions from this doc are marked with asterisks.)
- From College to Careers: Fostering Inclusion of Persons with Disabilities in STEM
- Accommodating Students with Disabilities in STEM: Finding from Research and Practice for Middle Grades through University Education
- CSMA recommendations for addressing financial cost of graduate applications
- "Lessons from the Experiences of Women of Color Working in Academia," by Yolanda Flores Niemann, *Presumed Incompetent: The Intersections of Race and Class for Women in Academia*, edited by Gabriella Gutiérrez y Muhs, Yolanda Flores Niemann, Carmen G. Gonzáles, and Angela P. Harris

Diversity Stakeholders / Communities of Support

- AAS CSMA
- AAS CSWA
- AAS SGMA
- NSBP
- NSHP
- Diversity academic/STEM 501c3 organizations & recurring annual conferences (see http://www.minoritypostdoc.org/view/stakeholders.html)

Data and Research

- NSF demographic data tables http://www.nsf.gov/statistics/2015/nsf15311/tables.cfm

Additional Resources

- Definitions of common terms from Suffolk University's Social Justice Terminology: http://www.suffolk.edu/campuslife/27883.php

Appendix: Common Acronyms

AAS: American Astronomical Society
AISES: American Indian Science and Engineering Society
APS: American Physical Society
CSMA: AAS Committee on the Status of Minorities in Astronomy
CSWA: AAS Committee on the Status of Women in Astronomy
GRE: Graduate Record Exam
HBCU: Historically Black Colleges and Universities
HSI: Hispanic-serving Institution
LGBTIQA*: Lesbian, Gay, Bisexual, Transgender, Intersex, Questioning, Agender, and other gender identities
MSI: Minority Serving Institution
NASA: National Aeronautics and Space Administration
NSBP: National Society of Black Physicists
NSHP: National Society of Hispanic Physicists
NSF: National Science Foundation
POC: People/Person of Color
SGMA: AAS Committee for Sexual-Orientation and Gender Minorities (formerly WGLE)
TCU: Tribal Colleges and Universities
TWI: Traditionally White Institutions
WGLE: Working Group on LGBTIQ Equality (2012-2015. Replaced by SGMA in 2015)