

Equity Now:

The Pasadena Recommendations for Gender Equality in Astronomy

This document was endorsed by the American Astronomical Society (AAS) Council on Sunday January 9, 2005, in San Diego, CA. This work is a collaborative effort made by many attendees of the "Women in Astronomy II: Ten Years After" meeting held in June 2003 in Pasadena with input and comments from the entire astronomical community. This document was presented to the members of the AAS Council by the 2003-2005 committee members of the AAS Committee on the Status of Women in Astronomy. Further information on implementing these recommendations may be found on our website: <http://www.aas.org/~cswa>

"The first problem for all of us, men and women, is not to learn, but to unlearn."

-- Gloria Steinem

Guiding Principles

- ❖ Women and men are equally talented and deserve equal opportunity.
- ❖ Full participation of men and women will maximize excellence in the field.
- ❖ The measure of equal opportunity is outcome, *i.e.*, gender equity will have been attained when the percentage of women in the next level of advancement equals the percentage in the pool.
- ❖ Long-term change requires periodic evaluation of progress and consequent action to address areas where improvement is necessary.

Context

In 1972, the AAS established a working group on the status of women in astronomy, and followed in 1978 with the formation of an *ad hoc* committee on the status of women. The principal recommendation of the latter group was the appointment of a standing Committee on the Status of Women. This Committee on the Status of Women was established in June 1979, to monitor the status of women in the field of astronomy and to recommend changes to improve it. In 1992, a seminal meeting on Women in Astronomy was held in Baltimore, Maryland. This conference led to the Baltimore Charter for Women in Astronomy, which offered a rationale for and steps toward gender equity in astronomy. The Baltimore Charter was based on input from the astronomical community, and the American Astronomical Society endorsed its goals in January 1994. In the ensuing decade many institutions recognized that there are impediments to the success of women in science and have developed strategies to increase diversity. The Committee is encouraged by the progress that has been made but recognizes that major inequalities still exist. Consequently, a second meeting on Women in Astronomy was held in Pasadena, California, in June 2003. Participants assessed the progress for women in science, offered insights into causes of the slower advancement of women, and discussed strategies to accelerate the achievement of equality.

Approximately one fourth of professional astronomers are women, and the field continues to attract women and benefit from their participation. However, the data show that women are still less likely to advance than their male colleagues. Future progress toward parity demands that the field evaluate itself periodically and implement changes based on the latest demographic data and the most successful solutions. Therefore, the Committee, with input from both the Pasadena meeting participants and the larger community, offers a new set of recommendations for progress. These recommendations emphasize the academic sector because of its unique influence on the future of the field. The Committee understands, however, that these problems are not limited to either academia or astronomy and calls on all scientists to work together toward equality. Finally, the Committee advocates that the strategies developed for the sake of encouraging gender equality be adapted to address the even slower advancement of minority scientists.

This document continues astronomy's proud tradition of community attention to women's issues and the formation of a consensus set of recommendations. Without continued positive action, progress toward diversity could halt or even reverse. Together, astronomers can improve the diversity of the community, draw on a broader talent pool, and thus remove impediments to achieving excellence in science.

Major Areas of Concern and Subsequent Recommendations

The following are specific areas of concern and possible recommendations to help improve gender equality in these areas through various methods. The individual areas include: A. Tenure-Track Hiring, B. Career Advancement and Recognition, C. Institutional Policies, D. Varied Career Paths, E. Cultural Issues, and F. Statistical Information.

A. Tenure-Track Hiring

Traditional hiring practices may work against women as candidates for tenure-track positions in research universities, large national observatories, and science institutes. Statistics show that the fraction of women in the tenure-track pool has increased over the last two decades, but the fraction of women in tenure-track positions has not grown commensurately. It is the clear responsibility of research organizations to take affirmative steps to ensure that all viable candidates for tenure-track positions are identified and given equal opportunity both for hiring and success. While specifically calling out tenure-track hiring as an area of immediate concern, we recognize that the same practices should be applied to hiring for *all positions*. In this spirit, we make the following recommendations to these organizations.

Recommendations

- 1. Ensure that all search committees for tenure-track positions contain two or more members whose specific task is to advocate for consideration of candidates from groups that are underrepresented in astronomy.**
- 2. Require that search committees be informed about what constitutes legal and ethical hiring practices.**
- 3. Actively recruit women to apply for tenure-track positions.**
- 4. Develop policies encouraging flexible means of accommodating dual-career couples.**
- 5. Require accountability in the hiring process, using appropriate institutional channels, so that results are commensurate with the possible candidate pool.**
- 6. If two candidates for the same position have equal qualifications within the uncertainties, the candidate from the underrepresented group should be hired.**

B. Career Advancement and Recognition

The "classic" career path for a professional astronomer has been a progression through undergraduate and graduate school, a postdoc or two, and then a research faculty job at a major university. Statistics indicate that women are lost from this "progression" in proportion greater than for men, for a variety of reasons such as unsupportive work environments, lack of role models, and insufficient opportunity for recognition of their performance. Recognition often comes in the form of professional awards and invited presentations, where women frequently have been underrepresented relative to their achievements. Informal mentoring is easy and widespread for young people who resemble those already in the field but often is nearly inaccessible to those from underrepresented groups. We offer several recommendations to ameliorate this situation:

Recommendations

1. Academic institutions should provide regular evaluation, mentoring and career counseling to young faculty members.

2. Universities and individual departments should set up formal programs to train mentors for younger students and professionals, with attention paid to both career and family issues. In addition, the AAS should sponsor periodic special sessions or short training programs at the semi-annual general meetings. The individual astronomy and physics departments then should take the responsibility of implementing a mentoring program, so that their more junior members have a mechanism to acquire support and advice. Specific areas of interest for training and mentoring would include information about rules (both written and unwritten), expectations, networking, and the general decision-making process of a particular institution.

3. Ph.D.-granting universities should recognize the potential of graduate-student applicants from institutions that traditionally serve underrepresented groups. Departments should develop working relationships with faculty at these institutions, and establish specific mentoring programs for graduate students who may undergo "culture shock" upon arrival at a major research university.

(B. Career Advancement and Recognition Recommendations – continued)

4. Decisions on advancement should result from an open process, based on specific criteria that are spelled out in advance. Senior faculty and other senior personnel must provide an environment that enables all junior faculty to have an equal opportunity to succeed and advance in this process.

5. Organizations and academic institutions should offer women equal opportunity for scientific recognition in the form of awards (AAS awards and others) and invitations to present invited talks in a variety of circumstances, including AAS meetings, topical professional meetings, and traditional colloquia/seminars. Prize nominee pools and invited speaker lists should adequately reflect the diversity of the astronomical profession. The institutions responsible for selecting awardees and invitees should review periodically their policies and progress in this area, in order to ensure that the achievements of women are being represented fairly.

6. Along with direct contributions to science, criteria for success should include teaching and other functional terms of employment. Specifically, outreach and education activities are important both for the future of astronomy and in relation to possible career paths; involvement in such activities should be supported and rewarded at all levels, including hiring decisions and performance evaluations. Paradoxically, individual women sometimes are heavily burdened with committee service in an effort to achieve greater diversity; this additional service also should be recognized in advancement decisions.

7. The responsibility to create institutional changes that promote equity in astronomy lies first and foremost with the senior and more established members of an institution. However, individuals at a more junior level have a strong interest in such change and should participate as is feasible. In addition, these younger astronomers should not be thwarted by apparent barriers, but should enthusiastically pursue their own goals and dreams for scientific achievement and career advancement.

C. Institutional Policies

Institutions have a responsibility to change the face of our profession, by developing and implementing policies that are friendly to women and that ensure equal access to all benefits and opportunities that will help them advance in their careers. Many institutions have policies that are limited in scope or outdated. This is particularly important in view of the "tidal wave" of young women currently at the entry level in astronomy; note that more than 50% of AAS members 18-23 years of age are women, but the fraction of women decreases systematically at later career stages. Consistent policies that are supportive of diversity, among institutions that grant degrees in astronomy or employ astronomers, play a critical role in "leveling the playing field" for women astronomers.

Recommendations

- 1. All institutions should establish and promote strong policies and training in the areas of sexual harassment and general ethics**, including clear complaint paths and accountability, taking care that these policies apply both to permanent employees and to short-term visitors (*e.g.*, students and visiting observers).
- 2. Institutions should endorse and implement the Statement on Gender Equity in Academic Science and Engineering** signed by the presidents of MIT, Harvard, Yale, Princeton, Penn, Michigan, Stanford, Berkeley, and Caltech in January 2001. The AAS should maintain a public list of institutions and organizations that endorse this Statement.
- 3. Members of the departments granting degrees in astronomy or employing astronomers should work proactively with their institutions to establish policies that allow all department members access to affordable health and childcare.** This access should not be reserved only for faculty, but be extended to graduate students, post docs, research and administrative staff as well.
- 4. All job applicants should be made aware of institutional policies and benefits** (*e.g.*, health care, childcare, leave policies, spousal/partner hire policies, spousal/partner job search assistance, and retirement) provided at all levels.

D. Varied Career Paths

Many, if not most, professional astronomers in the U.S. are employed in positions other than tenure-track positions at major research universities. Examples are employment at national or private observatories, NASA centers and contractors, science data centers, colleges that do not grant Ph.D.s, planetaria, industry, or in various roles in science or university management. The paths to these roles typically are not well understood, nor are the opportunities available to develop skills that are useful in these various types of positions.

Recommendations

1. Academic departments should encourage outside training in non-research fields, such as program/project management or science policy, in order to prepare their students for the possibility of future careers in managing a variety of scientific endeavors. This may include, for example, courses outside the academic department or department seminars given by people in various related careers.

2. Educational institutions that are co-located with related industrial employers, research institutions, or observatories should establish specific programs that enable students to "cross-train" between the university and the other organizations. Likewise, informal and formal science discussions, mentoring groups, seminars and colloquia, etc. at these professional institutions should have an open door policy and encourage student participation.

3. Mentoring programs such as that recommended in the section on "Career Advancement and Recognition" should include discussions and explorations of options outside the traditional faculty progression; astronomy departments should work with their university's career development centers, and with their own graduates, to provide information about these options to their undergraduate and graduate students.

E. Cultural Issues

Some of the strongest, but most difficult to quantify, reasons that individuals from underrepresented groups can feel disadvantaged arise from a mismatch with the majority "culture" -- *i.e.*, implicit norms and expectations of behavior. Specific recommendations that are made above would go far toward dealing with some of these issues in terms of policies and practices, but there remains a large gray area of subtle cultural issues that contribute to the underrepresentation of women in tenured and other leadership roles. In the words of Jocelyn Bell Burnell (*Science* 304, p. 489, 2004): "Women and minorities should not do all the adapting. It is time for society to move toward women, not women toward society."

Recommendations

1. Institutions should encourage gender-equity training and make it available at all levels. This should include discussions of the well-studied effects of subtle discrimination, unconscious bias, and the accumulation of disadvantage.

2. In an era in which the ability to work within a large team is becoming increasingly important for scientific success, departments should foster a collaborative and team-oriented approach rather than just the more traditional, competitive scientific culture. Responsibilities and rewards should be shared equitably in the team environment. It is also expected that such a team should be composed of diverse members of the department, where appropriate (for example, men and women, junior and senior faculty, students, etc.).

3. Good communication channels should be maintained and encouraged throughout academic departments and laboratories, both within peer groups and spanning traditional hierarchical levels. Department chairs should organize regular opportunities for two-way communication throughout the hierarchy.

4. Institutions should ensure that a career in research is compatible with having a family; professional activities (*e.g.*, class and meeting schedules) as well as employment benefits (*e.g.*, childcare, family leave, etc.) should be developed with this specific goal in mind.

F. Statistical Information

Evidence of the underrepresentation of women in the astronomical community relies on insufficient long-term statistical data. Recent studies (*e.g.*, Hoffman in WIA-II proceedings) indicate that there still is a "leaky pipeline" in the road to tenure-track positions in astronomy. At present, more than half of the AAS members in the range of 18-23 years of age are women, and one-third of the astronomy graduate students are women, but women occupy fewer than 15% of the astronomy tenure-track positions. Better longitudinal data, specific to astronomy, are needed to assess women's representation and to assess the effectiveness of remedies. The issue of statistics must be recognized for its central importance to understanding the social and cultural forces that shape the characteristics of our field.

Recommendations

- 1. The American Astronomical Society should commission immediately a longitudinal study of young women in astronomy, beginning with those aged 18-23 in 2003.** A similar group of men should be used as a comparison sample. Both subjects that remain in the field and those that leave the field should continue to be tracked for the duration of the study. The AAS should commit to continue this study for at least 10 years, in order to establish statistics on retention and career paths for this cohort. Professional sociologists, using accepted statistical techniques, should carry out this study. One goal of this study would be to measure whether there is differential attrition of women from the pipeline and if so, to learn the reasons for it.
- 2. The AAS should form a "Committee on Statistics" whose main objective would be collecting, analyzing and reporting data on the demographics of our field.** This committee could work closely with the CSWA and other relevant AAS committees (as well as organizations such as the National Science Foundation and American Institute of Physics (AIP) that conduct their own surveys). This committee should provide complete and regular access to statistics on items such as gender balance, the fraction of beginning students who earn their Ph.D., and the mean time to completion.
- 3. The above mentioned committee's prime focus should be to examine the demographic status of the AAS membership and the astronomical community in a three-fold approach:** (a) mining standardized yearly departmental reports (using those currently administered by the AIP) for statistical information, (b) administering and analyzing in depth periodic surveys (every 2 to 3 years but no more than 5 years between surveys) similar to the STSci/CSWA survey, and (c) giving input to and reporting results from longitudinal studies.