

EXECUTIVE COMMITTEE WORKING GROUP

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ORGANIZING COMMITTEE

WOMEN IN ASTRONOMY

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TRIENNIAL REPORT (2012-2015)

1. Context

The gender† dimension of science and technology has become one of the most important and debated issues worldwide, impacting society at every level. A variety of international initiatives on the subject have been undertaken, including the continued monitoring of the status of women in science by Unesco Institute for Statistics (UIS) or the annual reports “Education at a Glance” by the Organization for Economic Co-operation and Development (OECD) as well as field-related working groups and networking in order to collect data in a consistent manner. The majority of the international organizations have made clear statements about their discrimination policies (independently of their main field(s) of action), including the International Council for Science whose regulations are followed by the IAU. Gender equality at large is one of the eight United Nations Millennium Development Goals, which clearly calls for action related to science, technology and gender.

While the number of women undertaking higher education studies in STEM fields (Science Technology Engineering and Mathematics) continues to increase, women continue to be far away from the above-mentioned targeted goals of more gender balanced working environments and professional opportunities. The persistent disparity between women holding a PhD in science and women at the junior faculty level shows that the problem won't be solved by simply waiting. Targeted actions are still needed to address the under representation of women in both astronomy and science beyond the student years.

Most of the interest and action has so far come from discipline-based societies (like the American Astronomical Society and the Australian Astronomical Society) or highly committed political entities. Among the latter, the European Commission has strived

† In this report, we use the word ‘gender’ with reference to ‘men’ and ‘women’, only.

for sensitizing the public and R&D communities about gender issues and has invested significant efforts in monitoring the European situation (“She Figures” reports).

Two years ago the American Institute of Physics published a report (Ivie *et al.* 2013) about the distribution of female physicists and astronomers in those departments that offer a PhD in those fields. Female physicists represent approximately 14% of the Faculty total, while female astronomers can reach up to 20%. Females in both scientific fields are under-represented at the highest (full professor) levels. The AAS Committee on the Status of Women in Astronomy (CSWA) is also very much engaged and runs regular demographics surveys of astronomy departments and institutes as well as on conference invited speakers (with a 23% mean percentage of female astronomers, averaged during a period of 5 years).

Despite many recent efforts and improvements achieved on the status of women in astronomy (such as the Baltimore Charter, the Pasadena Recommendations and the IAU Resolution B4 that was passed at the General Assembly in Rio de Janeiro, in 2009 – see http://www.iau.org/static/resolutions/IAU2009_English.pdf), most studies continue to show the same patterns of gender disadvantages, both horizontally (per discipline) and vertically (per seniority level). Some interpretations have been put forward on the latter (namely, the small number of female full professors reflects the relatively small pool of female graduate and graduated students), but most recent figures do not seem to fully sustain this. It thus remains very important to keep tracking key figures. In this respect the project being conducted by the Demographics Committee of the American Astronomical Society and the AIP Statistical Research Center, i.e. a longitudinal study of everyone who was a graduate student in 2006-7, will be very valuable in order to track employment patterns and see if there are differences with gender.

2. The IAU Approach

Astronomy’s prime international organization –the IAU– has recognized and supported the needs and endeavours of women astronomers through the establishment of an Executive Committee Working Group, at its XXVth General Assembly in Sydney, Australia (July 2003).

An Organizing Committee (OC) of typically 10-16 persons manages the activities of the WG. OC membership must be ratified by the Executive Committee of the IAU, usually at its General Assembly. Being an EC WG, its OC also includes an EC-representative, who acts as a liaison between the EC and the OC. The OC elects two Office Bearers (a Chair and Deputy Chair for three-year terms). The WG reports directly through the IAU General Secretary.

The mandate of the IAU Working Group on Women in Astronomy is to collect information, propose measures, and initiate actions in support of, or to advance equality of opportunity for achievement between women and men in astronomy, in the IAU and in the world at large. It acts as a federation of national Women in Astronomy organizations, creating links and facilitating information exchanges worldwide.

2.1. 2003-2015

Since its foundation, the mandate of the WG has translated to:

(a) Monitoring the status of women in astronomy via collection of gender statistics. The WG has defined a set of statistics that would be interesting to collect, namely the gender distribution at different career levels in different countries. †

† This is a different initiative from the IAU-maintained geographical distribution of IAU members (<http://www.iau.org/administration/membership/individual/distribution/>)

This has proven very challenging to achieve ‡. More recently, the IAU WG has also recommended collecting and monitoring gender statistics related to IAU symposia (see http://www.iau.org/science/meetings/past/meeting_report/womeninastronomy/) via a dedicated report that is part of the reporting requirements for all IAU Symposia organizers. The first results were presented at the General Assembly in Beijing (China) in 2012. Since then, approximately 50% of the symposia submit these forms as part of their final report; the WG usually tracks down the other half.

(b) Organizing WG meetings and events at the IAU General Assemblies in the form of business meetings, coordinated women lunches (WAM, usually attended by 300+ participants), special events (IYA2009 ‘She’s an Astronomer’ Cornerstone Project). Among the latter, a first mentoring event was successfully organized at the 2012 IAU GA in Beijing (China).

In preparation for the XXIX IAU General Assembly in Honolulu, Hawaii, the WG has worked out a very ambitious programme of events. The now traditional Women in Astronomy Meeting Luncheon is scheduled for Tuesday, August 4. On top, the WG has innovated the meet-a-mentor event that was first launched at the GA in Beijing, by expanding the programme to include several mentoring sessions, introduced by a Student Welcome Reception. The opening reception is also scheduled for Tuesday, Aug 4 and it will be followed by mentoring sessions on Aug 5-7 and Aug 10-12, twice per day, for a total of 12 mentoring sessions. Finally, the WG has also planned a new series of events, in the form of three lunch talks, scattered through the entire length of the GA. This new feature (not present at any of the past General Assemblies) has been planned as a mean to keep the attention of as many IAU participants as possible focused on these topics throughout the GA meeting. The full programme is publicly available at: <http://iauwomeninastronomy.org/meetings/>.

The WG has also updated the statistics of IAU Symposia, at least for those who submitted their reports and it is in the process of updating the numbers for those symposia who had to be contacted directly.

As for the career-related gender statistics, these are indeed the most difficult ones to collect. The WG has just received the updated numbers from several countries in South America, which are being added to the website. The WG has a proposal on how to possibly make progress on this (see next section), but this is something that can be tested and become a regular feature only in the future. More recently, we have also received a few spontaneous updates from individuals who have published reviews and reports on this matter. These do not always match our proposed breakdown but they make an interesting reading. The plan is to add them to IAU WG WiA website as references.

2.2. 2015 and beyond

Clearly, a lot of effort has been invested in assembling the gender statistics we have today and in organizing several events at the last four General Assemblies and the upcoming one.

Does the outcome of these efforts justify the continuation of the WG Women in Astronomy? We, the WG OC, believe this is the case, but we also recognize the need for more actions and exploration of new avenues.

The most recent results of national studies show that despite the fact that the initial pool of PhD female graduates in astronomy has continued to increase, the research /academic career pipeline has not been fixed yet! The fact that women still feel discriminated

‡ Gender distribution available at: <http://www.iauwomeninastronomy.org/statistics/>

in terms of pay, recognition, visibility and awards (just to mention a few of the most common aspects) is telling us that we are far away from solving the problem. We shall not forget that we are today able to discuss significant metrics and figures, stating with confidence what has improved over the last one/two decades because sensitive data have continued to be collected.

Admittedly, one could also question the necessity for an international organization like the International Astronomical Union to engage in some of the WG specific tasks, lacking a direct influence on individual countries and their science-related policies. On the other hand, exactly because of its internationality, it is the only worldwide astronomical organisation that astronomers have and as such it should be concerned about the status of women in astronomy.

Diversity issues are clearly more global than gender discrimination issues, but recent attempts to globalize gender-specific dimensions into broader diversity issues did not work. In doing so, there is too high risk to lose sight of the gender related problems.

Therefore, the WG Organizing Committee unanimously recommends the IAU EC to maintain this advisory WG with even a slightly expanded mandate, based on the following considerations:

(a) The collection of gender statistics is of fundamental importance for the careful monitoring of the evolution of key figures. Snapshots are not as informative, we must be able to compare numbers.

On the specific aspect of country-based detailed gender statistics, the WG OC recognizes that national committees on “women in astronomy” are certainly much more successful in collecting and maintaining these important databases. They meet more regularly at the national level and control much more closely the evolution of the status of women in astronomy in their own national environment. Although these committees mostly apply to those countries with the larger astronomical communities (e.g. AAS CSWA, ASA in Australia), the IAU WG OC shall liaise and intensify its connections with them in order to engage them in some of the IAU WG tasks and share their figures. The recent close collaboration with the AAS CSWA has proven very successful and productive and represents a good starting point. Targeted actions by the WG OC may still be needed for smaller and less developed countries (see point #2)

(b) As already pointed out by Cesarsky & Walker (2010), IAU geographical distribution of members (see <http://www.iau.org/administration/membership/individual/distribution/>) is very diverse, even among the bigger (in terms of number of members) countries: the percentages corresponding to IAU female astronomers range from less than 7% to as high as 25%. As a reference, the global IAU percentage of female members is close to 16%.

Without any intention of leaving the smallest countries behind, it is however important to understand deeply the causes for such differences. These gender-inequalities are likely the end result of very different reality that touches upon a variety of sociological, cultural, political aspects. An effort shall be made to include these dimensions in the global gender dimensions picture, in order to better understand what the successes/failures, benefits/obstacles are confronting female astronomers around the world. The WG shall be much more present (via its members) in IAU Regional Meetings and start closer collaborations with local astronomical societies in the most under-represented countries or via the IAU Office of Astronomy for Development (OAD; see point #5 below).

(c) Stereotypes and biases affect each of us, though in different ways. The perception of this WG as women-only is wrong and should be fought against.

In other words, what can men do? The male percentages among the attendees to the GA WAM event and even in the WG OC are too small. Gender inequality is not a

women-only issue, rather an issue for women and men, equally. Male role models are needed to speak up about these issues. The WG has invited former IAU President Bob Williams to give a short keynote speech at the WAM Luncheon 2015 and has secured 4 male senior mentors. This point will be high on the WG agenda for the next three years in order to change the perception and involve more male colleagues. One very first action will be to invite more male colleagues on the WG Organizing Committee.

(d) Increase the visibility of the WG and expand its scope by collaborating with the IAU Office of Astronomy for Development. Following up on a very productive first tele-meeting, several points of common interest were identified by both parties. Among the very first ideas that are being explored there are: i. a close collaboration between OAD and WiA WG on setting up an IAU-wide mentoring programme; ii. a close collaboration on surveys and data collection, using the IAU WG OC expertise in the formulation of the gender component of the surveys and the geographically disperse OAD networks; iii. the production of material in the form of good-practices guides to be widely distributed, especially in the countries that OAD is working with in first person.

3. Concluding Remarks

Diversity is a key ingredient of our society and we shall strive for it, at all levels. Gender inequalities are impacting severely our professional environments, in some scientific/research fields more than others. They can be understood and reduced (or eliminated) only with commitment and dedicated actions, once again at all levels. Finally, the under-representation of women in several professional instances requires changing cultures and attitudes across the entire astronomical community. For all these reasons and taking into account the above-mentioned plans for the next three years, with special emphasis on setting up a successful and productive collaboration with the IAU Office of Astronomy for Development, we formally ask the IAU Executive Committee to extend the mandate of the Working Group of Women in Astronomy for a new term and hope the IAU EC will approve our request.

References

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- European Commission ? She?s Figures (last report)
http://ec.europa.eu/research/science-society/document_library/pdf_06/she_figures-2012_en.pdf
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<http://www.stsci.edu/stsci/meetings/WiA/BaltoCharter.html>
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<http://www.aas.org/cswa/pasadenarecs.html>
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Cesarsky & Walker 2010, <http://astrogeo.oxfordjournals.org/content/51/2/2.33.full.pdf+html>
IAU Office of Astronomy for Development
<http://www.astro4dev.org>

4. ADDENDUM

This report is an addendum to the document delivered to the IAU Executive Committee (hereafter EC) in July 2015 (see preceding Triennial Report) and focuses on the events organized by the WG Organizing Committee (OC) –in collaboration with the AAS Committee on the Status of Women in Astronomy– at the GA in Hawaii and on the WG OC action plan for the next triennium. It was delivered to the IAU EC at the end of the IAU GA.

4.1. *GA Events*

(a) Thanks to the generous support from the US National Academy of Science and the IAU, the 2015 Women in Astronomy Luncheon Meeting took place on Tuesday, August 4. More than 200 people (10% male, 90% female; 225 maximum capacity of the room) attended the event, which included three brief keynote speeches and table discussions. The event was opened by the welcome address of the AAS President Meg Urry, followed by IAU past-President Bob Williams and his views on quotas. The closing remarks were given by IAU President-Elect Silvia Torres-Peimbert, who noted that despite the continue increase in number of IAU members, the percentage of female astronomers stalls around 16%. For the table discussions, each table was provided with 3 possible conversation starters, that covered a broad range of topics: from common themes such as work-life balance, family issues, mentoring, unconscious bias to more specific issues like micro-aggressions, impostor syndrome, necessary skills to succeed, how to deal with stress, what is an ally, minority groups.

Participants were asked to take notes of the discussion which were then collected at the end of the event are impressive, both in quantity and quality! A short report is planned to appear on the AAS CSWA website next week, and will require an in-depth analysis by the WG OC. The largest feedback was received on the topic of unconscious bias, closely followed by work-life balance, required set of skills to succeed, micro-aggressions, alternative career paths. Several of the suggestions made by the participants are applicable to different areas/issues (e.g. importance of mentoring to talk about micro-aggressions, to discuss set of skills, to talk about discrimination). More specifically to the unconscious bias debate, there are now several test studies that suggest best practices (e.g., abolish spelled-out first names on grants/observing proposals applications) as well as on-line courses that talk about the subject and can be used as training tools. The need for specific training came up in several instances, both discussing the topic of the skills required to succeed and also to be prepared for alternative career paths. Specific training on management/leadership skills was emphasized, as senior faculty/management is key in giving the good example and can effectively influence the attitude/mentality of people on a variety of (discriminatory) aspects.

(b) Following up on the positive experience with Meet-A-Mentor primer session at the Beijing GA, this time we opted for multiple mentoring sessions, also due to different logistic solutions with respect to the Beijing GA. The Student Welcome Reception generously sponsored by the AAS kicked-off the mentoring programme on Tuesday afternoon, August 4. On the following 6 GA days, we organized two mentoring sessions per day, one in the morning and one in the afternoon, each covered by two senior mentors (24

mentors in total got involved). Initial feedback has been very positive, both from the mentors and the mentees. Formal feedback will be sought from all people who participated in the programme, in order to optimize the mentoring schema for the next GA in Vienna. In terms of (preliminary) numbers, we reached approximately 70-80 students, a 50% increase with respect to the number of students who participated in the Beijing event. The topics covered during the sessions were several: after a short bio given by the mentors, the students were free to ask questions.

(c) In order to increase its visibility during the entire GA, the WG OC organized for the first time a series of three lunch talks on social/behavioural/cultural aspects that affect all astronomers. The series was undoubtedly a success. The first 2 talks attracted 70-80 people. More than the number of attendees, the lively discussions during and after the talks went very well and demonstrated the need for discussing openly these issues. The first talk was given by Christina Richey (CSWA) and touched upon different climatic aspects in the workplace, presenting preliminary results from the recent survey carried out by the committee CSWA. The survey highlighted several discriminatory issues (micro-aggressions) that are not acceptable and usually impact negatively the life (professional and private) of astronomers, especially the younger ones. The second talk was given by Meredith Hughes and was a report from the first Inclusive Astronomy meeting, recently held at Vanderbilt University in June 2015 and of which she was one of the organizers: a few highlights from the main sessions at the meeting plus a preliminary set of recommendations. The third and last talk was given by Pat Knezek about unconscious bias. All speakers have been asked to share their presentations with the public; as soon as they are received, they will be linked from the IAU WiA website.

Last but not least, the press coverage of the Women in Astronomy events on the GA Daily Newspaper was very good, thanks to a pre-agreed plan of news, articles, reminders between the chair and the Press officer responsible for the newspaper.

4.2. *Future actions identified by the WG (2015-2018)*

The WG OC has discussed and identified the main areas where it would like to invest its efforts during the next three years. These were presented in general terms in the main report delivered to the IAU EC in July 2015 and cover the following areas: collection and monitoring of gender statistics, closer analysis of the geographical disparity across IAU member states in the fraction of IAU female members (i.e. cultural dimension), closer collaboration with the IAU Office for Astronomy Development. A more specific list of priorities has now been distilled from that report.

(a) Gender statistics: the WG is responsible for the collection and monitoring of different statistics.

- IAU Symposia – the schema is in place, it works well in approximately 50% of the cases. To remedy this, the OC proposes to contact the SOC members of all newly approved IAU Symposia and remind them about the gender feedback form among their deliverables. This will hopefully keep their awareness also on the often imbalance seen among conference speakers.
- Career-based data in IAU countries – The OC is convinced that this project will be much more successful in close collaboration with the national astronomical societies that have a much more detailed view of the distribution and career paths of their members. Thanks to the preparatory work for the GA in Hawaii, the interface with the AAS CSWA is already active. As a start, the WG plans to have its Organizing Committee members acting as the main contact points with their national societies, respectively.

(b) Surveying the IAU community: the OC thinks it would be important to follow up, e.g., some of the feedback received at the Women Luncheon, with a proper survey. The OC noticed that the results of some surveys are very centric to the country where they are launched, but the theme is of general interest. Therefore, a broader geographical coverage shall be included.

(c) Guidelines / Best practices: with the impressive feedback collected at this GA, the WG is in the best position to analyse this treasure of information and follow-up on some of the suggestions made. This analysis may end up in the formulation of guidelines and best practices, which is also something within reach of the OC.

(d) Mentoring: The OC has made a preliminary plan to collaborate with the IAU OAD on their global mentoring programme and even on future surveys, bringing in the WG expertise on the gender dimension. For future mentoring session, the OC will also make contact with the newly approved Office for Young Astronomers, who may be interested in being a partner as well in this initiative.

(e) WG visibility and its community: the WG needs to become more visible, more accessible to the wider community and to attract more male astronomers to its discussions. As a starting point, the OC proposes to assemble a mailing distribution list of all IAU members interested in the WG mission and topics, so that they can be updated regularly (e.g. via newsletters) on projects, activities, interesting readings, etc. To increase visibility, the OC plans to re-organize its web-site.

Finally, the OC greatly supports the idea of an Executive Vice President acting as a liaison between the WG and the Executive and hopes that this role will be kept. The WG is looking forward to any advice the EC may have in terms of new initiatives and programmes they would like to see implemented.