[Ontology]
Scientific community and society / Scientific community / Policy
[URI /706/648/453]
Scientific community and society / Scientific community / Ethics
[URI /706/648/179]
Scientific community and society / Scientific community / Events / Conferences and meetings
[URI /706/648/180/120]
Physical sciences / Astronomy and planetary science
[URI /639/33]

[Subject strapline]
Astronomical Community

[Title]
Equity and diversity in astronomy

[Standfirst, 240 chars max.]
'Why is there a black hole where women should be?' asked Member of Parliament Chi Onwurah during her plenary talk on women in science at EWASS 2018. Gender equity was among a variety of topics discussed in a day-long Special Session.

[Authors]
Helen E. Jermak, Sara Lucatello & Paul Woods

[Affiliations]
HEJ: Liverpool John Moores University, Liverpool, UK.
SL: INAF Osservatorio Astronomico di Padova, Padova, Italy.
PW: Nature Astronomy

The European Week of Astronomy and Space Science (EWASS) was held in Liverpool, UK in April 2018, combining the annual meeting of the European Astronomical Society (EAS) with that of the UK Royal Astronomical Society (RAS). More than 1300 delegates, hailing from 51 countries and six continents, attended the meeting, which covered topics ranging from solar physics to cosmology, and astronomical software to science policy. The organizing committees of the meeting resolved from the early planning stages to emphasize diversity, inclusiveness and ethics throughout. The recently approved EAS Code of Ethics was prominently displayed on the conference website and programme, funding was allocated to subsidise childcare for delegates and provide support to attendees with disabilities. A day-long Special Session entitled "Equity and Diversity in Astronomy" was held as part of the conference program, building on successful sessions in recent years.

The session was, in fact, the most successful Special Session of EWASS 2018 in terms of registered attendees, with a programme dedicated to talks and discussions on equity,

inclusivity, demographics, disability, gender, gender identity, mental health, neurodiversity, race, sexual orientation and unconscious bias in Astronomy and academia in general. Speakers emphasised solutions, advice and support which was very well received by many, with the room full to capacity (and others being turned away due to safety regulations). Some speakers highlighted areas of improvement (or lack of), whilst others introduced new viewpoints on the struggles of minorities. A few highlights are presented in this article, but full information and notes on the session can be found on the EWASS website.

The day opened with an unconscious bias workshop led by Katja Poppenhaeger. Katja presented a scientific analysis of students' perceptions of their tutors, showing that all students give lower evaluation scores to female lecturers, regardless of the gender of the student themselves. As part of the workshop discussion many audience members contributed their own experiences of gender inequality within academia. Suggestions for the improvement of gender equality in astronomy departments included fairer assessment of candidate CVs, setting diversity goals and requiring departments to explicitly explain why they are not meeting them.

During the plenary lunch talk, MP Chi Onwurah (Fig. 1) spoke about Ada Lovelace, Florence Nightingale and Katherine Johnson and argued that the way all women and people from diverse backgrounds are presented in the media needs to change. Networking and mentoring events need to be organised, with progress made measured and monitored, the achievements of women in science celebrated and most importantly role models and success stories showcased.

The post-lunch session's focus was on issues related to diverse identities in academia, in particular race, gender, gender identity and sexual orientation. Nana Ama Brown Klutse discussed the barriers for African researchers to attend conferences, and the lack of clear career progression that prevents students from choosing astronomy as a their profession. Ashley Spindler examined the worrying discrimination towards LGBT+ communities in physics, exemplified by survey results from the American Physical Society, suggesting that many people felt pressure to stay closeted. A similar survey has been completed within the UK by the Institute of Physics Diversity programme and the results will be published once they have been analysed.

The final session was aimed at highlighting issues within the areas of disability, neurodiversity and mental health. Nicolas Bonne explained that since all astronomers are visually impaired when looking at the universe, more resources should be put in place to facilitate scientists with blindness and visual impairments to pursue a career in astronomy.

One of the most poignant talks was given by Kate Furnell who reported on the reality of the working environments within academia, where many people have varied mental health experiences that are often compounded by stressful working conditions, poor work-life balance, lack of support, competitive environments, and imposter syndrome, amongst many other things. Kate's candid talk opened the discourse on mental health, with many attendees sharing their own experiences and their advice and generating an overall sense of support and understanding in the room.

Throughout the day, the meeting was characterized by lively, intense and extremely frank exchanges among speakers and an exceptionally engaged audience, making clear, once more, that we require spaces dedicated to discussing these issues within the astronomical community. Equity and diversity are, in fact, critical elements in innovation and forward thinking, and the productivity and creativity of academia can only be enhanced by allowing space for a diverse range of people to contribute. This requires promoting awareness, acknowledging the barriers that prevent many people from thriving in the academic environment and committing to building a culture of inclusivity. Encouraging everyone to perform and contribute in a safe and welcoming space is a key element for astronomy to progress.

Equity and diversity topics apply to all, however, at a large conference like EWASS an all-day session focusing on diversity issues clashes with science sessions, preventing many from being able to attend, contribute and learn. Encouraging conference organisers to consider separate plenary talks and sessions that do not overlap with similarly themed events, is important for inclusivity and allowing all to contribute.

So what were the lessons from this meeting in terms of advice for astronomers to promote diversity and inclusion in their department? We all have to be part of a general effort to create a community which fosters inclusion, welcomes and respects people regardless of their identities. We must actively engage in discussions on issues related to diversity, equality and ethics with our peers. We need to take time to consider, assess and discuss the unconscious biases that affect us when taking decisions at any level in our profession. We have to be considerate to and respectful of our colleagues, whatever career stage they are at. We need to not tolerate any abusive behaviour we encounter, whether it affects us directly or not. We have to urge our employers to ensure that all employees have access to the same healthcare and welfare provisions. We have to put pressure on our funding institutions to include diversity as one of the parameters on which institutions' performances and projects are evaluated. Finally, we have to start considering diversity and inclusion efforts as a legitimate and valuable part of our curriculum, and to encourage, support and reward people who chose to spend part of their work time engaging in these activities.

Acknowledgment
The authors would like to thank the other session organisers and facilitators: Violeta Gonzalez Perez, Johan Knapen, Sheila Kanani, Manolis Angelakis, Isabel Marquez, Marios Karouzos, Stacey Habergham-Mawson, Maisie Rashman and Rhana Nicholson, along with all the speakers and those who contributed to the session. The authors would like to acknowledge session sponsorship from *Nature Astronomy* and *Nature*.

Figure 1 | Chi Onwurah gives her plenary talk on how women scientists are presented in the media.