Equality, diversity and inclusion perspectives

An overview of the developments arising from equality, diversity and inclusion events at this year's National Astronomy Meeting, by **Vinesh Maguire-Rajpaul** on behalf of the organizers.

This year's National Astronomy Meeting at the University of Lancaster from 30 June to 4 July 2019 featured a diversity-themed lunch session followed by two sessions of equality, diversity and inclusion (EDI) talks running in parallel with the afternoon's scientific sessions, reflecting the commitment of the RAS to creating an environment that celebrates diversity and ensures quality and fairness. The conference also featured positive initiatives, including free on-campus childcare, delegates' choice of pronouns on conference badges and a strictly enforced code of conduct.

Diversity lunch and race equality

Diversity lunches have been held at NAMs since 2013 and this year's session was the most popular, with 128 people registering to attend – an increase even on last year's well-attended Equity & Diversity Lunch at the much larger joint NAM/EWASS (European Week of Astronomy and Space Science) meeting.

Sheila Kanani (RAS Education, Outreach and Diversity Officer, figure 1) opened the session by summarizing work the RAS is doing to encourage people of all backgrounds to study and pursue careers in astronomy, space science and geophysics, and to foster equality and inclusion within these fields. Kanani drew attention to RAS support for Ada Lovelace Day, regular RAS membership surveys and the upcoming bullying and harassment survey, the RAS Code of Conduct, an anonymous web-based reporting facility, development of an e-mentoring scheme and more. Kanani also highlighted work the RAS is doing with partner organizations such as Generating Genius and the LGBT+ Physical Sciences Network.

1 Sheila Kanani: highlighted the RAS's work with partner organizations. (RAS/Lynda Laird)

The main lunchtime speaker was **Ammara Khan** (head of the Race Equality Charter [REC] at Advance HE), who focused on race in STEM and academia. Khan began by discussing representation and attainment gaps and how they widen with academic career stage. For example, she noted that 13% of UK astronomy undergraduates are black and minority ethnic (BME), and that those BME astronomy students do slightly better than their white peers (86% obtain a first or 2:1 versus 74% of white students). Yet only 7% of academic staff in astronomy are BME, with only 8% of those BME staff in senior leadership positions; significantly higher fractions of BME staff are on short-term or part-time contracts than their white counterparts.

The REC, which was trialled in 2014/15 and formally launched in 2016, is designed to improve representation, progress and success of minority ethnic staff and students within higher education (HE). It was modelled on effective methodology used in Advance HE's Athena SWAN charter (which focuses on gender equality). Khan discussed the REC process requirements, which include consultations with BME staff and students, collection of qualitative and quantitative data including outcomes and experiences, creating a comprehensive, evidence-based action plan and publishing progress towards meeting objectives. At the time of NAM 2019, the REC had 56 member institutions; 12 hold bronze awards, none hold a silver award and the criteria for gold awards have yet to be finalized (see ecu.ac.uk/equality-charters/race-equality-charter).

Demography, representation and gender

After lunch, the two 90-minute parallel EDI sessions began. Each session ended with a panel discussion including the four speakers from that session and the session chair.

Fran Bagenal (University of Colorado, Boulder) kicked off proceedings and noted that she was speaking in the very room in which she attended undergraduate physics lectures in the 1970s. She offered nuanced and sometimes surprising perspectives on the demography of our field, for example that countries ranking highly on the Global

2 The university's InfoLab21 research centre lit up in Pride colours during NAM 2019. (V Maguire-Rajpaul)

Gender Gap Index (e.g. Finland, Norway) have very low fractions of women among STEM graduates; conversely, countries with the most women among STEM graduates (e.g. Turkey, Algeria) rank lowest (Stoet & Geary 2018). Focusing on the USA, Bagenal also discussed the gender gap in college physics and astronomy, with women strongly under-represented at bachelor's level, and more so at PhD level. Worse still, the percentage of US physics bachelor's degrees awarded to women has actually been dropping over the past 15 years – and common explanations for this do not seem adequate. For instance, women in STEM without children are no more successful than those with children, while countries with strong parental leave provisions (e.g. Scandinavian countries) actually have very few women in physics. Clearly, much further work is needed to understand and address these issues.

Next, **Anuradha Damale** (chair of UKSEDS, the national student space society) discussed diversity in the space sector. She noted that the UK Space Agency plans that the UK will make up 10% of the global space sector by 2030: this demands a larger and more diverse workforce. The most recent RAS demographic survey (Massey *et al.* 2017) showed that 79% of the UK physical sciences workforce identifies as male, and over 92% white; troublingly, 28% of LGBT+ people say they have considered leaving the sector vs 16% of non-LGBT+ people (according to *Exploring the Workplace for LGBT+ Physical Scientists*, a joint report by the RAS, Royal Society of Chemistry and the Institute of Physics; see bit.ly/33FyWfH). But she also offered reasons to be optimistic. UKSEDS' National Student Space Conference drew a much more diverse audience, with three times as many BME participants as the sector average and a significantly higher LGBT+ representation. Damale suggested possible reasons for this success, including active promotion of diversity and the creation of more inclusive environments at conferences.

"UK Space Agency plans demand a larger and more diverse workforce"

Stephen Wilkins (University of Sussex) then presented a quantitative analysis of publicly available data on gender, ethnicity, socio-economic background and national/regional domicile in UK higher education. He noted that while gender does not seem to be a relevant characteristic when examining participation in HE as a whole, the picture changes when it comes to STEM. Male students are strongly over-represented, as are white students, and this polarization is significantly worse in physics than in STEM more broadly. Wilkins suggested that while such quantitative studies are an important step towards making physics more representative of the UK as a whole, it is not enough simply to engage under-represented groups within physics: more must be done to encourage members of those groups to choose physics in the first place.

Lastly, **Vivienne Wild** (University of St Andrews) presented preliminary results from a study on the impact of gender on student experience among physics undergraduates. The research focused on a course in which the female-to-male ratio is lower in the integrated master's programme than the bachelor's programme and used about 400 responses, corresponding to completion rates of 60–90% across five different year levels. The four main psychological constructs probed were mindset (beliefs about intelligence), well-being, physics identity (the extent to which one defines oneself as a physicist), and self-efficacy (belief in one's own capabilities); the latter two are known to be strong predictors of career intentions and persistence in physics. Wild showed that the gender difference in student experience appeared to be quite small, though the female students surveyed had slightly lower self-efficacy scores, and they developed a slightly more fixed mindset with time. The largest difference was among the final-year BSc students, who scored significantly worse than all other groups in many measures, suggesting interventions may be useful for this group. A longitudinal study is under way.

A brief discussion at the end of the session covered topics including the diverse backgrounds of the panellists, the ways in which senior institutional leadership can help advance diversity causes, the importance of providing platforms for people rather than speaking on their behalf, and strategies for confronting scepticism about diversity initiatives in general.

Prestige bias and social capital

Jane Greaves (Cardiff University, figure 3) opened the second EDI session with an analysis of prestige bias in telescope time allocation – something that should, ideally, be based purely on the merits of submitted proposals. She presented data from a high-profile facility showing that over one seven-year period, serving members of the time allocation committee (TAC) were awarded time for three times as many projects as non-TAC applicants in control samples – despite projects of TAC members being assessed by independent panels. This apparent "prestige bias" may be unconscious; with all else being equal, members of the TAC may be given

3 Jane Greaves analysed prestige bias. (RAS/Lynda Laird)

Feedback: positive, with room for improvement

Attendees were encouraged to complete a feedback questionnaire online: 23 people did so. While the responses in this small, self-selected sample cannot be taken as representative, they provide useful insights.

All but three respondents were between 18 and 44 years old; about a third were students, and the remainder scientists. A majority identified as male (57%), with two identifying as transgender, and two as non-binary or genderqueer. A little over half (57%) identified as heterosexual; the others were mostly bisexual (22%) or homosexual (13%). 78% of respondents identified as white, with none identifying as black or Northern African/Middle Eastern.

48% of respondents were living with a medical condition, with 35% declaring a mental illness. While mental illness appeared to affect respondents regardless of age, occupation, gender or ethnicity, considered separately, only one of the eight respondents with a mental illness was a white, heterosexual, cis-gendered man, despite a third of all respondents sharing these characteristics.

We were very pleased that 65% declared they felt "definitely included" in the EDI sessions and nobody said they felt excluded. All respondents felt either "definitely" (45%) or "to some extent" (55%) comfortable speaking up. Among the comments and suggestions were several requests to make the EDI session standalone (plenary) in future. Respondents appreciated the speakers' presentations, although there were calls for more time for discussion and networking.

the benefit of the doubt because they are members of a group regarded as experts. Worryingly, Greaves also showed that 79% of those electing not to serve beyond their first year on the TAC were women or from minority ethnic groups, and that they were awarded less – not more – telescope time while serving on the TAC. Male principal investigators (PIs) were more likely to be awarded time for multiple projects than female PIs. Fully anonymizing proposals would, Greaves hoped, go a long way to addressing some of these problems.

Then **Ashley Spindler** (University of Hertfordshire) introduced the concept of social capital, which she described as the resources available to a person because of their networks and relationships. People with high social capital can gain attention, influence others, build new networks, generate financial capital and protect themselves from criticism. Drawing an analogy with socialism and the redistribution of financial capital, Spindler suggested that social capital could be redistributed by allies; being an ally is about using your social capital in ways that advance the causes of those with lower social capital, which could include disabled people and members of ethnic minorities or the LGBT+ community. She offered some guidelines on how to be a good ally, including collaborating generously, giving credit where due, bringing people together and being an active bystander – and ended with a case study, in which YouTube creator Harris Brewis used his high social capital to amplify the voices of trans people. Incidentally, Spindler's talk also introduced many audience members to PowerPoint's automatic, real-time closed captioning feature – a useful tool for inclusion.

Mental health, bullying and harassment

Next, **Chris Arridge** (University of Lancaster) discussed the place of mental health in modern research culture. He noted that PhD students and academics have been shown to be six times more likely to suffer from mental health problems than society as a whole (Evans *et al*. 2018), with the disparity more severe among women and transgender people. The stigma associated with mental health problems means that they are underreported, undertreated and underplayed. Arridge cited a large study of psychological distress among PhD students (Levecque *et al*. 2016) as a basis for discussing structural problems that contribute to this dire situation in academia, including the many conflicting demands placed on academics, intellectual strain, emphasis on metrics such as *h*-indices (index of scientific research impact), insufficient time for deep thinking, family–work tensions, lack of support structures, job insecurity, imposter syndrome, the "publish or perish" paradigm and neurotypical privilege. He drew on a number of quotations to ground these topics in lived experience and ended with an appeal for academe to focus on maximizing well-being rather than *h*-indices.

"She gave a powerful, thought-provoking and personal account of harassment"

Rachael Livermore, the final speaker of the day, gave a powerful, thought-provoking and personal account of bullying and harassment in academia. These problems are exacerbated, she suggested, by highly concentrated power structures, a pervasive "genius myth", tenure and lack of centralized oversight, among other factors (see e.g. Clancy *et al*. 2017). She noted that making a formal complaint is rarely easy and usually lengthy and that the process can place grave burdens on the victim. The privacy of the bully or harasser – whose behaviour may be normalized or downplayed by colleagues – is often privileged over that of the victim, who in turn might suffer retaliation and ostracization. And, at the end of the whole process, an acknowledged bully or harasser might not suffer any professional consequences. The upshot of policies that are not enforced is that many victims end up leaving academia, with guilty parties feeling free to continue the same behaviour. Livermore called for cultural change, with early intervention and professional consequences for bullies and harassers. Livermore also drew extensively on the harrowing personal experiences that sadly culminated in her leaving academia, for which she received a particularly rousing round of applause; many people thanked her for her courage in sharing her story.

At the end of the second session, audience members spoke of how familiar they were with the issues raised by the speakers. A wide-ranging panel discussion covered topics including a comparison between academia and industry, the role of the ally, the importance of unions, the need to look beyond metrics when evaluating academics, career development pressures faced by non-tenured academics, opportunities to do research outside universities and maintaining a healthy work–life balance. The discussion came to a close with a statement from **Phil Diamond** (RAS Executive Director), who shared some of his own experiences and welcomed suggestions from the speakers on how the RAS could better address problems of bullying and harassment.

The healthy attendance, the breadth of topics, the constructive discussions and the very positive feedback from attendees mean that we feel both encouraged and cautiously optimistic about the future. We may have a long way to go in building a truly equitable, diverse and inclusive community, but we seem to be heading in the right direction. We look forward to NAM 2020 and encourage as many people as possible to contribute. ●

AUTHOR

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