(A personal perspective on)

Gender Equality Initiatives in the UK

David Croydon
Research Institute for Mathematical Sciences
Kyoto University

PDEs and Probability Theory: Beyond Boundaries
Diversity and Inclusion in Mathematics Exchange Session

2 June 2021

The Athena SWAN Charter

(SWAN = Scientific Women's Academic Network)

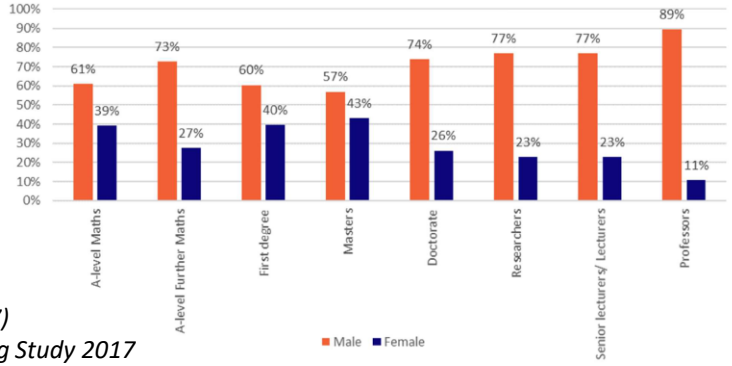
Introduced in 2005. Initially set out to encourage and recognise commitment to advancing the careers of women in science, technology, engineering, mathematics, and medicine (STEMM) institutions of higher education and research.

Members expected to apply for Athena SWAN awards, at Bronze, Silver or Gold level. Each award is valid for four years. Currently, 962 awards held:

- 164 are held by institutions;
- 798 held by departments.

Members commit to adopting ten principles, which focus on promoting and supporting gender equality for women. In particular, the charter aims to address what is known as the "leaky pipeline" of women progressing to senior roles in science by removing obstacles to their advancement through action at all levels across the department or organisation.

Athena, in front of the Academy of Athens



UK Mathematical Sciences (2016/17)
Source: LMS, National Benchmarking Study 2017

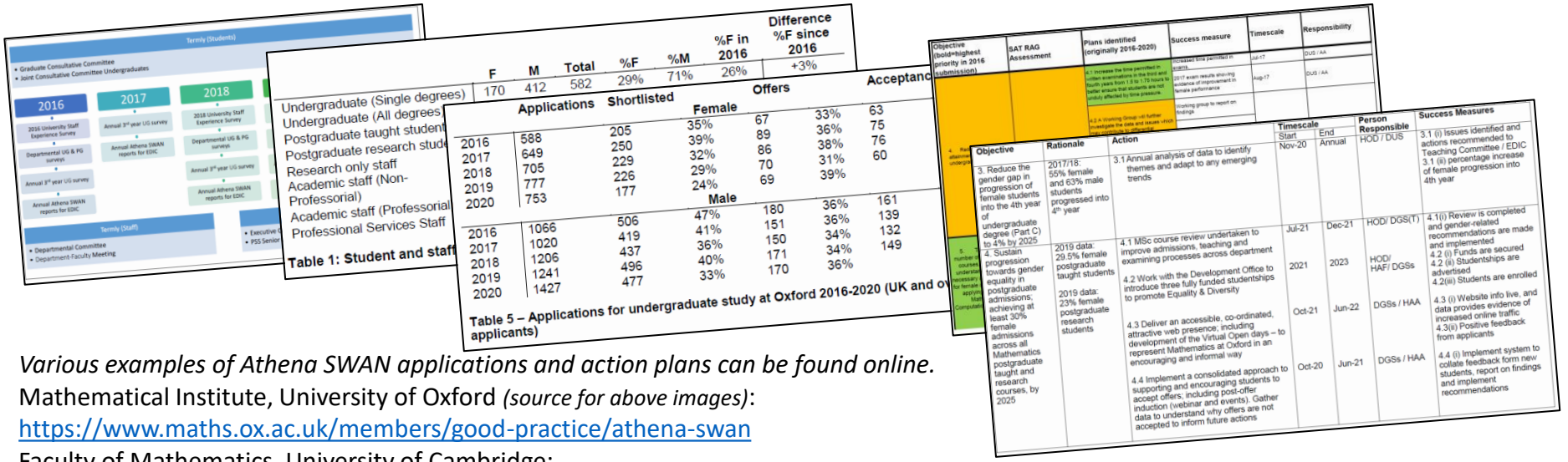
Official webpage: https://www.advance-he.ac.uk/equality-charters/athena-swan-charter
Some of the above text is adapted from https://en.wikipedia.org/wiki/Athena_SWAN

Application and action plan

Committee members: Typically men and women, range of levels (PhD to Prof, plus support staff).

Application: Outlines how the various Athena SWAN principles have been incorporated into policies, practices and culture, and the impacts of previous actions.

Action plan: Proposal of new actions to tackle outstanding issues (measurable, responsibilities clear).



	F	M	Total	%F	%M	%F in 2016	Difference %F since 2016
Undergraduate (Single degrees)	170	412	582	29%	71%	26%	+3%
Undergraduate (All degrees)							
Postgraduate taught student							
Postgraduate research stud							
Research only staff							
Academic staff (Non-Professorial)							
Academic staff (Professorial							
Professional Services Staff							

Table 1: Student and staff

	Applications	Shortlisted	Female	Offers	Acceptanc
2016	588	205	35%	67	33% 63
2017	649	250	39%	89	36% 75
2018	705	229	32%	86	38% 76
2019	777	226	29%	70	31% 60
2020	753	177	24%	69	39%
			Male		
2016	1066	506	47%	180	36% 161
2017	1020	419	41%	151	36% 139
2018	1206	437	36%	150	34% 132
2019	1241	496	40%	171	34% 149
2020	1427	477	33%	170	36%

Table 5 – Applications for undergraduate study at Oxford 2016-2020 (UK and o applicants)

Objective (bold=highest priority in 2016 submission)	SAT RAG Assessment	Plans identified (originally 2016-2020)	Success measure	Timescale	Responsibility
		4.1 Increase the time permitted in	Increased time permitted in exams	Jul-17	DUS / AA
			2017 exam results showing evidence of improvement in female performance	Aug-17	DUS / AA
		4.2 A Working Group will further investigate the data and issues which may relate to differential	Working group to report on findings		

Objective	Rationale	Action	Timescale Start	Timescale End	Person Responsible	Success Measures
3. Reduce the gender gap in progression of female students into the 4th year of undergraduate degree (Part C) to 4% by 2025	2017/18: 55% female and 63% male students progressed into 4th year	3.1 Annual analysis of data to identify themes and adapt to any emerging trends	Nov-20	Annual	HOD / DUS	3.1 (i) Issues identified and actions recommended to Teaching Committee / EDIC 3.1 (ii) percentage increase of female progression into 4th year
4. Sustain progression towards gender equality in postgraduate admissions; achieving at least 30% female admissions across all Mathematics postgraduate taught and research courses, by 2025	2019 data: 29.5% female postgraduate taught students 2019 data: 23% female postgraduate research students	4.1 MSc course review undertaken to improve admissions, teaching and examining processes across department 4.2 Work with the Development Office to introduce three fully funded studentships to promote Equality & Diversity 4.3 Deliver an accessible, co-ordinated, attractive web presence; including development of the Virtual Open days – to represent Mathematics at Oxford in an encouraging and informal way 4.4 Implement a consolidated approach to supporting and encouraging students to accept offers; including post-offer induction (webinar and events). Gather data to understand why offers are not accepted to inform future actions	Jul-21 2021 Oct-21 Oct-20	Dec-21 2023 Jun-22 Jun-21	HOD/ DGS(T) HOD/ HAF/ DGSs DGSs / HAA DGSs / HAA	4.1(i) Review is completed and gender-related recommendations are made and implemented 4.2 (i) Funds are secured 4.2 (ii) Studentships are advertised 4.2(iii) Students are enrolled 4.3 (i) Website info live, and data provides evidence of increased online traffic 4.3(ii) Positive feedback from applicants 4.4 (i) Implement system to collate feedback form new students, report on findings and implement recommendations

Various examples of Athena SWAN applications and action plans can be found online.

Mathematical Institute, University of Oxford *(source for above images)*:
https://www.maths.ox.ac.uk/members/good-practice/athena-swan

Faculty of Mathematics, University of Cambridge:
https://www.maths.cam.ac.uk/internal/faculty/equality-and-diversity/women-in-mathematics/athena-swan

School of Mathematics, University of Bristol:
https://www.bristol.ac.uk/maths/working-environment/swan/

Department of Mathematics, University College London:
https://www.ucl.ac.uk/maths/equality-and-diversity/athena-swan

---

o Evidence-based o Local context o Concrete actions o Monitoring

Some academic discussion

Plenty of work has gone towards discussing the scope of the scheme, and its effectiveness.

Kalpazidou Schmidt et al. Health Research Policy and Systems (2020) 18:19
https://doi.org/10.1186/s12961-020-0527-x

Health Research Policy and Systems

RESEARCH Open Access

Understanding the Athena SWAN award scheme for gender equality as a complex social intervention in a complex system: analysis of Silver award action plans in a comparative European perspective

Evanthia Kalpazidou Schmidt[1*], Pavel V. Ovseiko[2], Lorna R. Henderson[2,3] and Vasiliki Kiparoglou[3,4]

Abstract

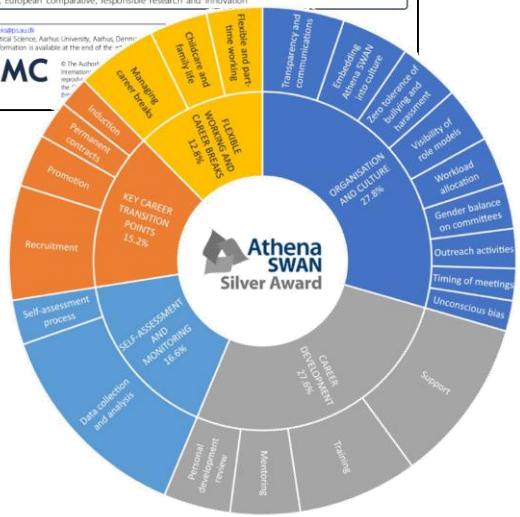
Background: Given the complex mix of structural, cultural and institutional factors that produce barriers for women in science, an equally complex intervention is required to understand and address them. The Athena SWAN Award Scheme for Gender Equality has become a widespread means to address barriers for women's advancement and leadership in the United Kingdom, Ireland, Australia, the United States of America and Canada, while the European Commission is exploring the introduction of a similar award scheme across Europe.

Methods: This study analyses the design and implementation of 16 departmental Athena SWAN Silver Action Plans in Medical Sciences at one of the world's leading universities in Oxford, United Kingdom. Data pertaining to the design and implementation of gender equality interventions were extracted from the action plans, analysed thematically, coded using categories from the 2015 Athena SWAN Charter Awards Handbook and synthesised against a typology of gender equality interventions in the European Research Area. The results were further analysed against the complexity research literature framework, where research organisations are perceived as dynamic systems that adapt, interact and co-evolve with other systems.

Results: Athena SWAN is a complex contextually embedded system of action planning within the context of universities. It depends on a multitude of contextual variables that relate in complex, non-linear ways and dynamically adapt to constantly moving targets and new emergent conditions. Athena SWAN Silver Action Plans conform to the key considerations of complexity – (1) multiple actions and areas of intervention with a focus on the complex system being embedded in local dynamics, (2) the non-linearity of interventions and the constantly emerging conditions, and (3) impact in terms of contribution to change, improved conditions to foster change and the increased probability that change can occur.

Conclusions: To enact effective sustainable structural and cultural change for gender equality, it is necessary to acknowledge and operationalise complexity as a frame of reference. Athena SWAN is the single most comprehensive and systemic gender equality scheme in Europe. It can be further strengthened by promoting the integration of sex and gender analysis in research and education. Gender equality policies in the wider European Research Area can benefit from exploring Athena SWAN's contextually embedded systemic approach to dynamic action planning and inclusive focus on all genders and categories of staff and students.

Keywords: Athena SWAN, gender equality award scheme, medical sciences, complexity approach, typology of interventions, European comparative, responsible research and innovation



Viewpoint

Athena SWAN and ADVANCE: effectiveness and lessons learned

Sue V Rosser, Sarah Barnard, Molly Carnes, Fehmidah Munir

Lancet 2019; 393: 604–08

Office of the President, San Francisco State University, San Francisco, CA, USA (Prof S V Rosser PhD); School of Business and Economics (S Barnard PhD) and School of Sport, Exercise and Health Sciences (F Munir PhD), Loughborough University, Loughborough, UK; and Department of Medicine and Center for Women's Health Research, University of Wisconsin, Madison, WI, USA (Prof M Carnes MD)

Correspondence to: Prof Sue V Rosser, Office of the President, San Francisco State University, San Francisco, CA 94132, USA
srosser@sfsu.edu

For more on the **#LancetWomen initiative** see https://www.thelancet.com/lancet-women

Introduction

As educational attainment has increased globally in recent decades, women's participation in higher education (ie, university level or above) has also risen greatly. Although discoveries and practices within science, medicine, and global health have a tremendous effect on women, women's representation as researchers and leaders in these fields continues to lag. This Viewpoint discusses the current situation and interventions of two high income countries: the USA and the UK.

Increasing the pipeline of women receiving science, technology, engineering, and mathematics (STEM) degrees has not translated to comparable percentages of women in the STEM workforce in either the USA or the UK.[1] Disaggregated US data show a higher attrition of women throughout their academic careers compared with men, resulting in lower proportions of full female professors—ranging from 10% in engineering to 38% in psychology.[2] Further, US universities awarding the majority of research doctoral degrees have fewer full female professors, as well as fewer women at the lower ranks of assistant and associate professors compared with less research intensive institutions. Similar trends are evident in the UK: in 2014–15, women represented 47% of all postgraduate research students and 45% of academic staff, but only 19% of professors in science, engineering, and technology, 23% of all professors, and departments can then submit documentation outlining how they have adopted these principles within their policies, practices, action plans, and culture, and the impact of this.

Submission documents are analysed on gender-disaggregated data and an associated action plan that builds on any issues identified from the data. Universities and departments are also expected to provide evidence of good practice in addressing gender inequalities that goes beyond standard legal requirements. Based on the submitted documents, the ECU can award recognition at bronze, silver or gold levels, with each representing different achievements in promoting and documenting gender equity. Awards can be given at institutional and department levels; no award is also possible. Gold award departments are those that demonstrate the SWAN initiative in mainstreaming gender and leadership.[3]

Between 2005 and 2017, the charter grew from ten original members to 140 institutions. Changes in UK higher education institutions towards greater recognition of gender inequalities were spurred by funding programmes (the National Institute for Health Research [NIHR] funding for Biomedical Research Centres and Patient Safety Translational Research Centres)[4] and the 2011 announcement that funding from the NIHR would require the academic partners to have at least Athena SWAN silver status.

Increasingly, the ECU has been highlighting an intersectional perspective on the experiences of women in higher education, by running a gender equality charter mark and a race equality charter in addition to Athena SWAN. Athena SWAN has also gained visibility outside of the UK, with much interest in their approach to tackling gender inequalities, particularly in Ireland and Australia since 2015.[5]

Description of ADVANCE

In the USA, a 1997 workshop examined the National Science Foundation's (NSF) portfolio of programmes to enhance careers of faculty women.[1] Analysis of qualitative and quantitative data led participants to recommend structural approaches to promote systemic change and gender equity, so as to increase the percentage of women in most STEM disciplines, especially in senior and leadership positions such as full professor, chair, dean,

Panel: Lessons learned from Athena Scientific Women's Academic Network (SWAN) and ADVANCE

High quality data

- High quality data are essential for measuring institutional change
- Baseline data before intervention is required for benchmarking
- Team should agree on common definitions
- Data should be disaggregated and any incorrect, incomplete, improperly formatted, or duplicat amended or removed
- Data should include both quantitative and qua metrics

Appropriate leadership

- Leadership must be commensurate with the d and scope of systemic change
- The president, provost (USA) or pro-vice-chan must be invested and possibly hold a leadersh ADVANCE and Athena SWAN work
- Women leaders might experience positive and effects on their career
- Men in science, technology, engineering and n (STEM) should become more involved for long sustainability

Implementation and sustainability of policy ch

- Policy changes depend on the senior management team
- Recruitment, hiring, research support, tenure and promotion criteria, and work-life balance represent frequent focuses of policy change
- Once in place, even negative policies might be difficult to eliminate
- Women should be represented on the senior management team and willing to challenge individual beliefs that go against diversity

Obtaining good-quality gender-disaggregated data is essential for measuring institutional change. Baseline data, common definitions of terms, and so-called cleansed data (incorrect, incomplete, improperly formatted, or duplicated data amended or removed) are required metrics against which implemented changes can be measured. Being crucial for a range of reasons, these data provide evidence of gender inequalities used to inform and persuade key actors to support and provide budgets for actions. Naming the problem and specifying the issues in particular contexts underpins much of the progress to date, allowing institutions to develop targeted action plans. Data also allows benchmarking, longitudinal tracking of progress, and evaluation of initiatives, although comparisons across institutions have been infrequent and qualitative studies that offer rich descriptive findings are not generalisable.[8]

ANALYSIS

Check for updates

Effect of Athena SWAN funding incentives on women's research leadership

Analysis shows that funding incentives can work and more funders should trial them, say Pavel V Ovseiko and colleagues

Pavel V Ovseiko,[1] Mark Taylor,[2] Ruth E Gilligan,[3] Jacqueline Birks,[4] Leena Elhussein,[5] Mike Rogers,[2] Sonja Tesanovic,[2] Jazmin Hernandez,[2] Glenn Wells,[5] Trisha Greenhalgh,[6] Alastair M Buchan[1]

[1] Radcliffe Department of Medicine, University of Oxford, Oxford, UK
[2] NIHR Central Commissioning Facility, Twickenham, UK
[3] Advance HE, London, UK
[4] Centre for Statistics in Medicine, Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, University of Oxford, Oxford, UK
[5] Oxford Academic Health Science Centre, Oxford, UK
[6] Nuffield Department of Primary Care Health Sciences, University of Oxford, Oxford, UK

Correspondence to: P V Ovseiko
pavel.ovseiko@drtc.ox.ac.uk

Cite this as: *BMJ* 2020;371:m3975
https://doi.org/10.1136/bmj.m3975
Published: 26 October 2020

"Is it difficult being a woman scientist?" the biochemist Dorothy Crowfoot Hodgkin was asked at high table dinner in an Oxford college by the man sitting next to her. "Not since I won the Nobel Prize," she replied.[1] In 1964, the British press had reacted to her award with the headlines: "Oxford housewife wins Nobel" and "British woman wins Nobel Prize—£18 750 prize to mother of three."[2] While such overtly sexist treatment of female scientists by the media is now rare, progress towards gender equality in universities has been astonishingly slow.

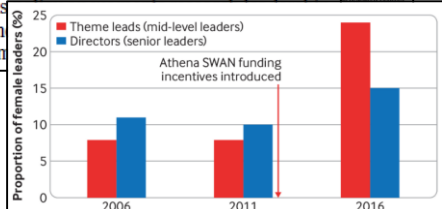
A UK parliamentary inquiry into women in scientific careers found that with only 17% of professors in science, technology, engineering, and mathematics (STEM) in 2011-12 women were still under represented at senior levels across all STEM disciplines.[3] Concerned with the sustainability of increasing the scientific workforce, the inquiry concluded that efforts to inspire more women into science were wasted if they were subsequently disadvantaged compared with men and recommended that universities should do more to support and retain women in scientific careers.[3]

To accelerate women's advancement and leadership, the UK's National Institute for Health Research (NIHR) introduced an innovative policy intervention in 2011 linking its research funding to the implementation by universities of gender equality action plans through the Athena SWAN (Scientific Women's Academic Network) charter (box 1). We examine the effect of this policy intervention in NIHR funding and incentives more broadly.

- *Career development*—Training, appraisal and development review, support for career progression, support for research grant applications
- *Flexible working and managing career breaks*—Cover and support for maternity and adoption leave; maternity return rate; uptake of paternity, shared parental, adoption, and parental leave; flexible working; transition from part-time back to full-time work after career breaks
- *Organisation and culture*—Culture; human resources policies; proportion of heads of school, faculty, or department by gender; representation of men and women on committees; participation on influential external committees; committee workload; policies, practices, and procedures; workload model; timing of meetings and social gatherings; visibility of role models; outreach activities.

The framework is applied to both institutions and departments. Institutions focus on the institutional structures and policies to enable change, whereas subject departments act as the agents of change by improving hiring, retention, and promotion decisions, workplace practices, and organisational culture at discipline level.

Institutions and departments apply to have their applications and action plans peer reviewed by subject specific panels of academics, experts, and Athena SWAN professionals from other participating institutions against the self-assessments presented and good practice in the field. Applicants receive constructive feedback and awards commensurate with the committed effort and outcomes[4]:



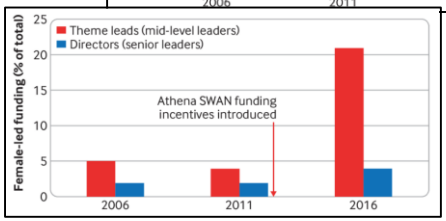


Fig. 1 Athena SWAN Silver award interventions by theme, subtheme and frequency of actions in 16 departmental action plans in medical sciences at the University of Oxford, 2014–2017

Much more to find online if you are interested!

LONDON MATHEMATICAL SOCIETY
EST. 1865

Council Statement on Women in Mathematics

https://www.lms.ac.uk/sites/lms.ac.uk/files/Council%20Statment%20on%20Women%20in%20Mathematics_0.pdf

Committee for Women and Diversity in Mathematics

Operates grant schemes, events and the good practice scheme.

https://www.lms.ac.uk/about/committees/women-mathematics-committee

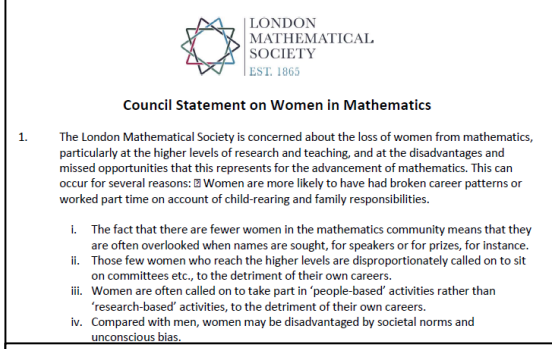
Good Practice Scheme

Provides specific support for departments working towards Athena SWAN award status.

https://www.lms.ac.uk/women/good-practice-scheme

See in particular:

- *"Advancing Women in Mathematics", which gives many examples;*
- *"National Benchmarking Study", which gives data for context.*

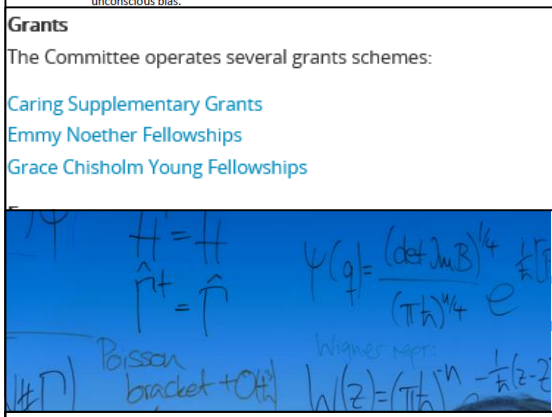


LONDON MATHEMATICAL SOCIETY EST. 1865

Council Statement on Women in Mathematics

1. The London Mathematical Society is concerned about the loss of women from mathematics, particularly at the higher levels of research and teaching, and at the disadvantages and missed opportunities that this represents for the advancement of mathematics. This can occur for several reasons: Women are more likely to have had broken career patterns or worked part time on account of child-rearing and family responsibilities.

   i. The fact that there are fewer women in the mathematics community means that they are often overlooked when names are sought, for speakers or for prizes, for instance.
   ii. Those few women who reach the higher levels are disproportionately called on to sit on committees etc., to the detriment of their own careers.
   iii. Women are often called on to take part in 'people-based' activities rather than 'research-based' activities, to the detriment of their own careers.
   iv. Compared with men, women may be disadvantaged by societal norms and unconscious bias.



Grants

The Committee operates several grants schemes:

Caring Supplementary Grants
Emmy Noether Fellowships
Grace Chisholm Young Fellowships

Benchmark 7: Decision making

It is good practice for all appointments and promotions (including postdoctoral research staff) to be made by panels that include at least one man and one woman. Training is provided for panel members and is required for panel chairs (so that no candidates are disadvantaged by the process). The department makes sure that individuals who participate in the process at department level are representative of the F/M staff profile of the department.

Indicator 7A: Appointment panels gender balance: at least one man and one woman

While some departments did include at least one woman and one man on all appointment panels, the small number of women (and concerns about overburdening them) was frequently cited as a problem. Several departments referred to the appointment of panel members as gender blind. One commented that the preference was to ensure that panels were understanding of the variety of individual circumstances regardless of gender. Some had found ways around the issues of small numbers of women academic staff. One department reported appointing a female from another relevant department. Alternatively, all members of the department provided input into short-listing, and after presentations by candidates on interview days, even though there might not have been women on the interview panel.

The position on postdoctoral research fellow appointments was often not clear. One department stated that there was no requirement for at least one woman and one man on all appointment panels for postdoctoral research fellow appointments.

Good practice reported by departments:

- University policy that panels include at least one man and one woman was adhered to and monitored.
- Women were appointed to panels from other relevant departments.

Indicator 7B: Representativeness of appointment panel membership

In many departments, the composition of short-listing and interview panels was determined by the university/faculty, and the number of department representatives was limited, often just the HoD, and the relevant head of research group. Some

Good practice reported by departments:

- The HoD had made a positive decision to include early career people on panels - making it easier to find women to serve on panels.
- All academic staff were encouraged to contribute to an academic selection process (e.g. by making comments on candidates' CVs, participating in a post-presentation discussion, etc).
- All eligible women in the department would be on the department selection and promotion committees for higher level positions until gender balance as routine became feasible.

Indicator 7C: Unconscious bias/no candidate disadvantaged

Overall the general feeling was of goodwill, with departments keen to appoint qualified women, if possible. However, this was not the case everywhere. One department stated that unconscious bias was not considered at any point in the appointment process. Another department reported that although training was compulsory before staff could sit on any selection committee, the issues surrounding unconscious bias were not covered.

One department had concerns that although they were clear about the need to avoid unconscious bias, the panel chairs were typically from outside the department and could often be less sympathetic to these issues, thus emphasising the need for a whole institution approach to issues like unconscious bias.

Good practice reported by departments:

- University HR ensured all panel members were appropriately trained in equal opportunity issues.
- Unconscious bias was covered in internal training - attendance was encouraged for all on panels and is compulsory for panel chairs.
- Panel members were all trained to be aware of unconscious bias.

LONDON MATHEMATICAL SOCIETY
EST. 1865

Advice on diversity at conferences and seminars

https://www.lms.ac.uk/adviceondiversityatconferencesandseminars

Example of implementation:

https://www.lms.ac.uk/grants/conference-grants-scheme-1

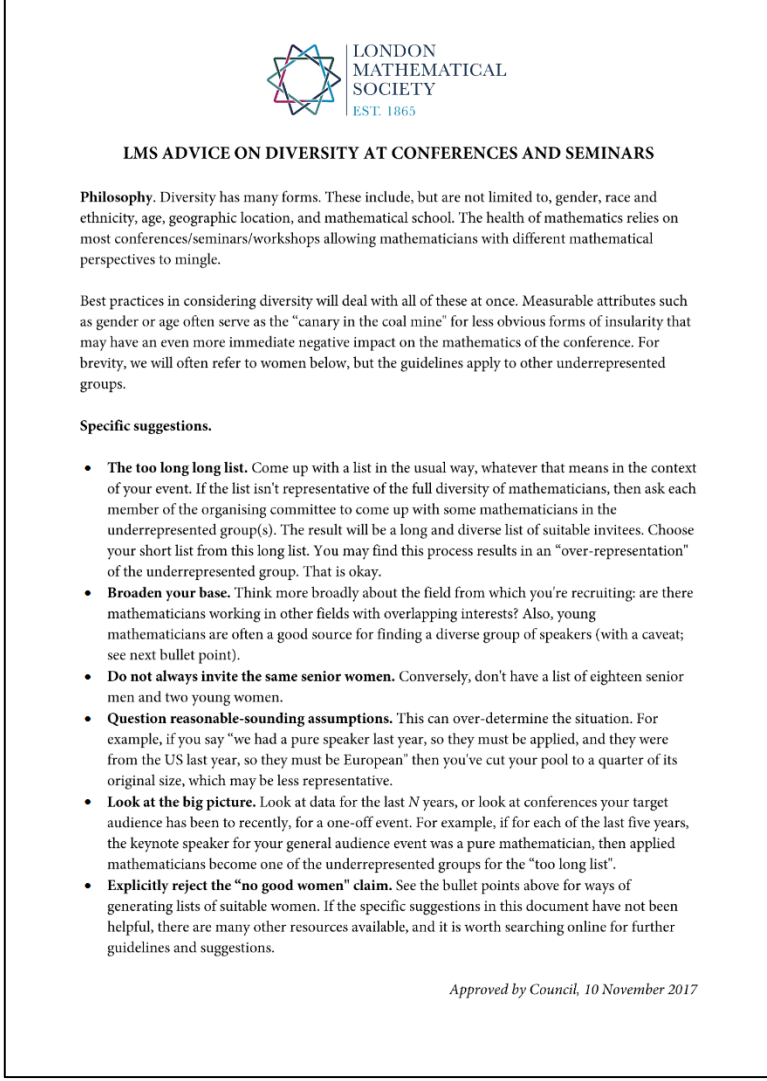
Conference Grants

From the guidance:

- Applicants must comply with the Society's policy on Women in Mathematics - please note that the Society considers a lack of invited women speakers to be a very real problem, and a failure to include women speakers are grounds for refusal for funding.
- Additionally, please note the following advice on diversity at conferences/workshops/seminars.
- In addition, the Society allows the use of the grant award to cover Caring Costs for those attendees who have dependents.

From the application form:

- Please indicate any who have provisionally accepted an invitation to attend and the gender of all speakers. The Society expects that the organisers of conferences who are seeking grants will invite both male and female speakers. Failure to comply with this policy is a common cause of rejection.
- The full statement of the Society's policy on Women in Mathematics is available here. Consideration should be given to the provision of mechanisms to enable participation by people with children or family responsibilities.
- *Budget includes:* Other, including caring costs.



LONDON MATHEMATICAL SOCIETY
EST. 1865

LMS ADVICE ON DIVERSITY AT CONFERENCES AND SEMINARS

Philosophy. Diversity has many forms. These include, but are not limited to, gender, race and ethnicity, age, geographic location, and mathematical school. The health of mathematics relies on most conferences/seminars/workshops allowing mathematicians with different mathematical perspectives to mingle.

Best practices in considering diversity will deal with all of these at once. Measurable attributes such as gender or age often serve as the "canary in the coal mine" for less obvious forms of insularity that may have an even more immediate negative impact on the mathematics of the conference. For brevity, we will often refer to women below, but the guidelines apply to other underrepresented groups.

Specific suggestions.

- **The too long long list.** Come up with a list in the usual way, whatever that means in the context of your event. If the list isn't representative of the full diversity of mathematicians, then ask each member of the organising committee to come up with some mathematicians in the underrepresented group(s). The result will be a long and diverse list of suitable invitees. Choose your short list from this long list. You may find this process results in an "over-representation" of the underrepresented group. That is okay.
- **Broaden your base.** Think more broadly about the field from which you're recruiting: are there mathematicians working in other fields with overlapping interests? Also, young mathematicians are often a good source for finding a diverse group of speakers (with a caveat; see next bullet point).
- **Do not always invite the same senior women.** Conversely, don't have a list of eighteen senior men and two young women.
- **Question reasonable-sounding assumptions.** This can over-determine the situation. For example, if you say "we had a pure speaker last year, so they must be applied, and they were from the US last year, so they must be European" then you've cut your pool to a quarter of its original size, which may be less representative.
- **Look at the big picture.** Look at data for the last *N* years, or look at conferences your target audience has been to recently, for a one-off event. For example, if for each of the last five years, the keynote speaker for your general audience event was a pure mathematician, then applied mathematicians become one of the underrepresented groups for the "too long list".
- **Explicitly reject the "no good women" claim.** See the bullet points above for ways of generating lists of suitable women. If the specific suggestions in this document have not been helpful, there are many other resources available, and it is worth searching online for further guidelines and suggestions.

Approved by Council, 10 November 2017