Department Application

Bronze and Silver Award

Name of institution	**University of Cambridge**
Department	**Institute of Astronomy**
Focus of department	**STEMM**
Date of application	**April 2017**
Award Level	**Bronze**
Institution Athena SWAN award	**Date: Sept 2014 Level: Silver**
Contact for application Must be based in the department	**Dr. Ian Parry**
Email	**irp@ast.cam.ac.uk**
Telephone	**01223 337092**
Departmental website	**www.ast.cam.ac.uk**

Glossary

IoA	Institute of Astronomy
AP	Action Plan
SAT	Self-assessment team
Tenured	A tenured position is one where the post-holder has a contract that ends with retirement.
Non-Tenured	A non-tenured position is one where the post-holder has a fixed end-of-contract date.
Researcher	A person employed to primarily do research and teaching, i.e. an academic.
Support-staff	A person whose main role is to support the activities of the researchers. Support staff are also sometimes referred to as non-academic staff.
HPC	High performance computing
Fellow	Typically a senior researcher on a fixed-term contract who directs his/her own research
Postdoc	Typically a researcher on a fixed-term contract whose research is directed by a more senior researcher
HESA	Higher Education Statistics Agency
E&D	Equality and Diversity
SPS	School of Physical Sciences

1. A) LETTER OF ENDORSEMENT FROM THE CURRENT HEAD OF DEPARTMENT

As Head of Department and active contributor to this Athena SWAN application it gives me great pleasure to write this endorsement letter. Both across the UK and globally, there is a large gender imbalance in astronomy and I am actively seeking to address this issue at the Institute of Astronomy (IoA). The disparity hinders career progress for women and must be reduced by encouraging good practice across the department. Instilling equality for all and what we do for women will help all minorities. Athena SWAN principles are key to progress and we are embedding them into our culture and working practices through our action plan ensuring they benefit everyone at all levels including assistant staff.

Since the last application for Bronze (2015), progress has been made in several areas.

- SAT was expanded to give representation across gender and career types, including myself and both deputy directors.
- SAT meets more frequently and reports directly to the academic staff committee.
- I wrote to the Institute of Physics allowing IoA to become a Juno Supporter.
- We have undertaken two comprehensive surveys of all people at the IoA (undergraduates, who join in their third year from Maths and Physics, and everyone else) to inform our action plan.
- We now provide funding support for researchers following maternity leave to ensure they can complete the full length of their contracts.
- We have scrutinized our recruitment procedures and actively seek to ensure women are encouraged to apply for vacancies and are appropriately represented on shortlists. We offer training to reduce the effects of unconscious bias.

A vital aspect of IoA is its role as an incubator for astronomers worldwide. I have been keen to support initiatives to enable all our researchers to flourish. Many students, and Post-Doctoral Researchers go on to fellowships and tenure-track positions elsewhere. I have ensured that weekly colloquia are representative, with over 27% women in the last 3 years rising to 42% this academic year. Since August 2016 twelve of our researchers have been offered faculty positions; four were women: as high a success rate for female researchers as men. The small number of permanent posts in IoA means that we have a limited internal career 'pipeline', instead forming a springboard for young researchers. It is important to me that we facilitate all researchers to do their best through interaction, networking, exchange of ideas via talks, daily coffee sessions, researcher-organised seminars, group meetings and Outreach.

We currently face an uncertain future in science following Brexit and the landscape for our teaching and research is bound to change. I hand over the role as Acting Director of the Institute in six months, and will be delighted to think that efforts that have been made under my direction as the result of pursuing our Athena SWAN accreditation will form strong foundations ensuring continuity

for improved gender equality, fair representation, progression and success for all, long into the future.

The document is an honest and accurate representation of IoA actions and intentions.

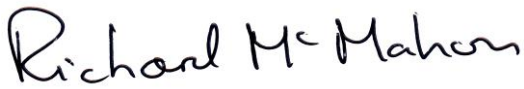
A C Fabian, Director

Word count: 498 words

B) LETTER OF ENDORSEMENT FROM THE NEXT HEAD OF DEPARTMENT

I am extremely pleased with the equality and diversity progress that we have made recently, especially in the context of gender equality, and I enthusiastically write this letter to give my full endorsement of this application for an Athena SWAN Bronze Award. Personally, I strongly believe in the importance of fairness and inclusiveness and so I was very happy to join our SAT over a year ago. I have very much enjoyed being part of the team and directly being involved in the excellent progress that we have made. In Oct, I will move up from Deputy Director to Director and I fully intend to remain on the SAT and continue my involvement in the Athena SWAN process which I believe is a tremendous force for good when it comes to delivering positive change in the workplace.

Like all worthwhile things, our Athena SWAN programme requires commitment and investment and as Director I will ensure that this important work is properly resourced and fully integrated in to the IoA's overall programme. I see the Athena SWAN process as one of the IoA's top priorities and we will continue to work hard on this while I am the Director.



Richard McMahon

Word count: 200 words

2. DESCRIPTION OF THE DEPARTMENT

The Institute of Astronomy (IoA) is a major centre for research and teaching in astronomy and astrophysics, combining outstanding research, a friendly work environment, and active promotion of diversity and equality. We provide a training ground for outstanding astrophysicists (both male and female) who go on to major institutions worldwide. This process has recently been augmented by active measures to ensure diversity and equality.

The IoA occupies the original University Observatory site. There are four office buildings and five telescope buildings on an open site with beautiful gardens. The modern Hoyle building includes the large lecture theatre and the coffee area and is occupied by 90 people. The site includes the Battcock building which houses the Physics department's astronomers.

We have a horizontal management structure to ensure an equitable distribution of power and responsibilities, and create a friendly and efficient work environment. The academic staff committee, comprising all the permanent academic staff, oversees the overall functioning of the IoA. A small senior management team which reports to the staff committee, meets weekly and includes the director and the two deputy directors including one woman professorial member. The various other committees are shown in Fig. 2.1.

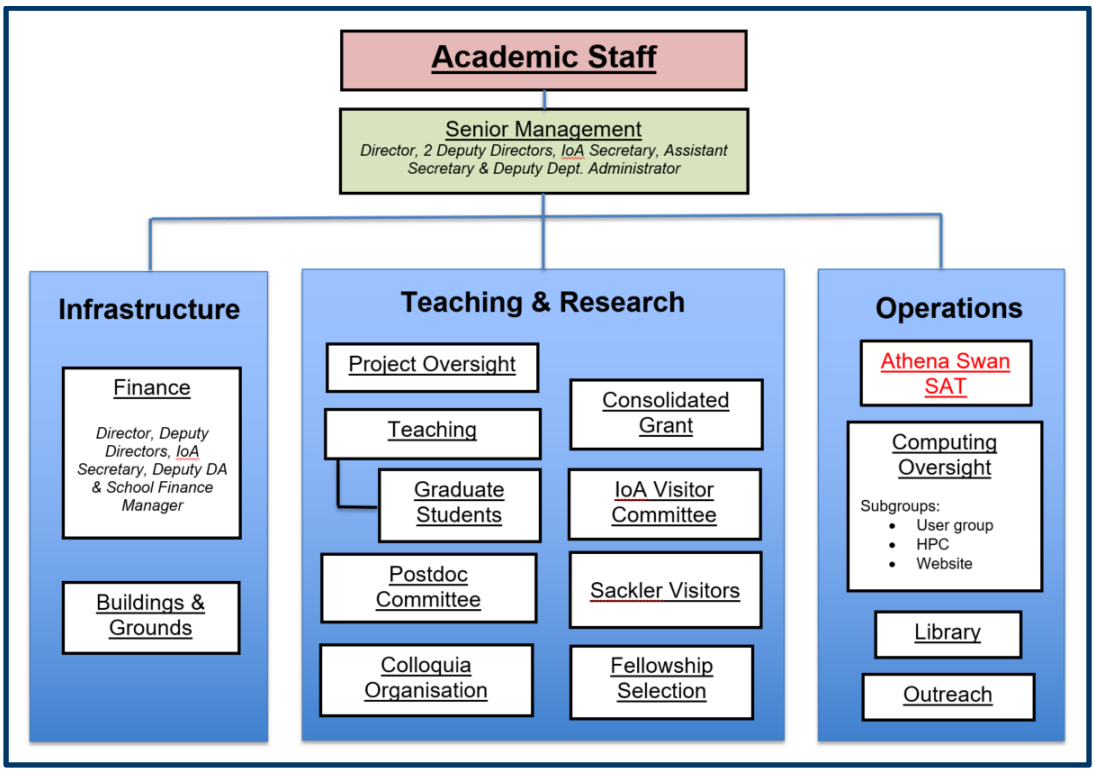


Figure 2.1: *An organogram of the IoA Committee structure for April 2017 depicting the groupings of departmental committees which report to the Academic Staff Committee.*

To ensure inclusivity, our committees have wide representation including students, postdocs, and support staff. While principles of gender equality and diversity are proactively pursued in general, a specific committee has been

created to focus on Athena SWAN principles and bring them to the utmost prominence. These efforts are in addition to the strong adherence to the University's existing instruments to ensure dignity at work, dignity at study, and anti-harrassment and anti-bullying procedures.

Research and teaching span the entire breadth of astrophysics. At the senior level, women scientists amount to 12% of the permanent academic staff and nearly 30% of the 66 fixed-term contract postdoctoral research staff. In the last 3-4 years, there has been a marked increase in the number of postdoctoral research staff due to increased successes in grant funding. These researchers form the largest group at the IoA, playing a very active role in the life of the IoA and gender equality has been proactively ensured in this group.

We offer a wide range of degree opportunities. The 3rd year undergraduate course provides students with a wide range of standard subject choices in physics and astrophysics. The Masters-level 4th year undergraduate course focuses on advanced training in specialized subjects introducing students to the forefront of modern astrophysics and the students do individual research projects. There is also an MPhil course which is a one-year postgraduate programme based mainly on research. Our PhD programme attracts some of the best students from across the UK and abroad with a yearly intake of 10-12 students. The PhD programme is supported by various proactive measures to encourage diversity, gender-equity, transferable skills, and ensure student well-being. Our 49 PhD students include 29% women - more than the current national averages of 22% for Physics and 27% for Maths.

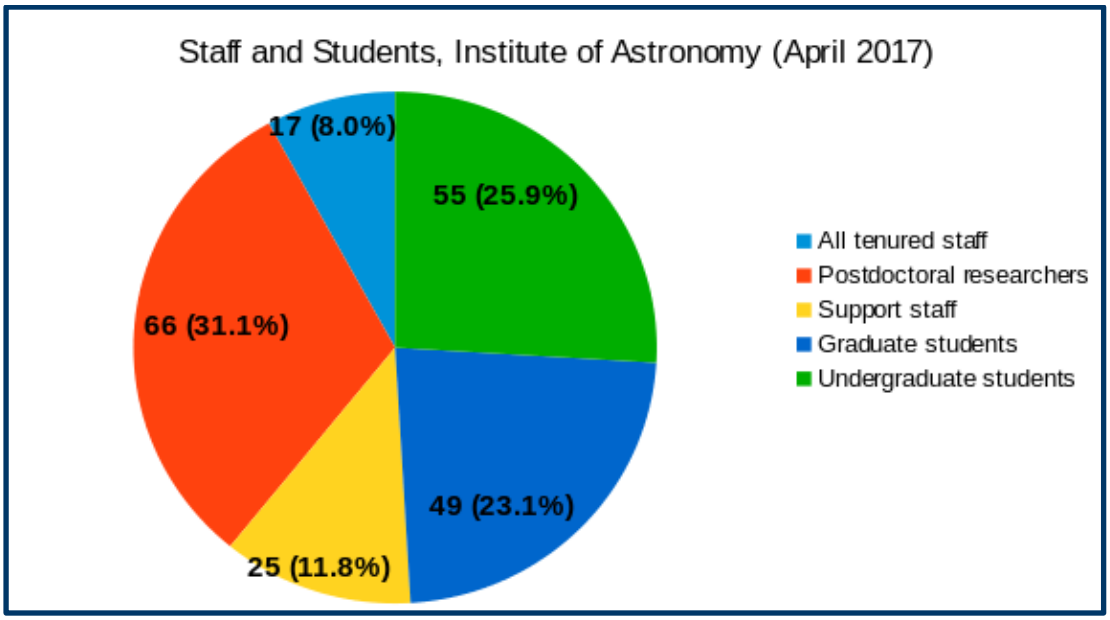


Figure 2.2: *A snapshot of personnel at the IoA in April 2017 showing numbers in each category and percentage of total. "Postdoctoral researchers" includes "Fellows" (senior researchers on fixed-term contracts).*

Table 2.1: *Personnel at the IoA in April 2017 showing numbers by gender.*

Grade	Number M	Percentage M	Number F	Percentage F	Number Total
Professor	10	91 %	1	9 %	11
Reader	3	75 %	1	25 %	4
Senior Lecturer	1	100 %	0	0 %	1
Lecturer	1	100 %	0	0 %	1
All tenured staff	15	88 %	2	12 %	17
Fellows	8	73 %	3	27 %	11
Postdoctoral researchers	42	76 %	13	24 %	55
Support staff	5	20 %	20	80 %	25
Graduate students	35	71 %	14	29 %	49
Year 3 undergraduates	12	60 %	8	40 %	20
Year 4 undergraduates	28	80 %	7	20 %	35
Total	145	68 %	67	32 %	212

Table 2.2: *The distribution of support staff across 3 groups: technical (IT support, Outreach, Librarian), administration (secretarial, finance) and cleaning/maintenance.*

Group	# M	% M	# F	% F	# Total
Technical	4	50%	4	50%	8
Administration	1	9%	10	91%	11
Cleaning/maintenance	0	0%	6	100%	6
Totals	5	20%	20	80%	25

Word count: 491 words.

3. THE SELF-ASSESSMENT PROCESS

3.1 The self-assessment team

A high level of support for the Athena-SWAN process is evidenced by our large self-assessment team (SAT) which has 22 members (11 female, 11 male – see table 3.1) spanning males and females at all career stages: undergraduate, postgraduate student, postdoctoral research associate, public astronomer, academic faculty and administrators. Many of the SAT members experience dual career family life including caring responsibility for elderly parents.

In assembling the SAT our main concern was to ensure that all groups were represented and that there was good intersectionality and we believe we have successfully achieved this.

For tenured staff, being on the SAT contributes to their overall workload indicator which is a document that is used to allocate work evenly. Currently, there is no formal workload allocation process for the rest of the SAT members because it is simply assumed that they spend all of their time doing research work. This assumption was valid until recently but now we purposely include postdocs, fellows and students on departmental committees. We have therefore instigated an action in our action plan to address this issue.

AP48: *Develop a formal workload model for academic researchers on fixed-term contracts.*

Table 3.1: SAT membership April 2017

SAT Member	G	Role	Comments
Dr. Manda Banerji	F	Fellow	Personally committed to gender equality in science.
Dr. Nick Bate	M	Postdoc, co-chair of the IoA Astro-Postdoc Committee	Dedicated to improving diversity and equality in the workplace
Dr. Amy Bonsor	F	Dorothy Hodgkin RS Fellow	Has one young daughter (born 2014) and currently works part-time in order to balance caring responsibilities with an academic career
Prof. Cathie Clarke	F	Professor of Theoretical Astrophysics, Deputy Director, IoA Dignity@Work contact, SAT chair March 2014 to March 2016, member of the academic staff committee, member of the senior management team,	One son (born 1997); her husband's career breaks and part-time working have allowed her to work full time throughout her career
Dr. Sue Cowell	F	Head of IT	Bio-medical background. Worked in industry then as a research academic now is member of the IoA support staff

SAT Member	G	Role	Comments
Dr. Carolin Crawford	F	IoA Public Astronomer, original SAT member	Ex-member of national and local women in STEM groups. Qualified trainer in career and personal development for female staff and students. Married to an astronomer with two adult children. Worked part-time for several years.
Dr. Colin de Graf	M	Postdoc, member of the IoA Astro-Postdoc Committee	Married to a non-academic, who has moved to accommodate his positions three times, including to two foreign countries.
Dr. Denis Erkal	M	Postdoc, member of the IoA Astro-Postdoc Committee. Moving to a faculty position outside Cambridge later this year	Experience of a fixed-term postdoc contract and moving internationally with a spouse who is also a working academic
Prof. Wyn Evans	M	Professor of Astrophysics, original SAT member, member of the academic staff committee	Experienced the difficulties of work-life balance as a father of two young children and as a carer for a sick parent.
Prof. Andrew Fabian	M	Professor of Astrophysics, IoA Director, Chair of the academic staff committee, Chair of the senior management team,	Married to an astronomer with two adult children.
Dr. Ghina Halabi	F	Postdoc, University Representation and Policy Officer for STEMM in the Postdocs of Cambridge Society Committee, member of the IoA Astro-Postdoc Committee.	Strongly committed to the Athena SWAN principles. Will represent the Institute of Astronomy in Texas in June.
Dr. Anna Hourihane	F	Postdoc	Involved in outreach projects engaging young people with astronomy and to increase the interest of girls in careers in STEMM.
Mrs. Mary Howe	F	Departmental Secretary, Dignity@Work contact, member of the academic staff committee and member of the senior management team	Married with two adult children. Experience of UK and overseas jobs organised around husband's scientific career and childcare needs.
Mr. Adam Jermyn	M	Ph.D. Student	At Caltech served on body dealing with sexual harassment and discrimination and was a councillor for student mental health.
Dr. Nikku Madhusudhan	M	Lecturer, member of the academic staff committee	Personally committed to removing all forms of discrimination in science.

SAT Member	G	Role	Comments
Dr. Farzana Meru	F	Leverhulme Early Career Fellow. Moving to a faculty position outside Cambridge later this year	Daughter born Feb 2015. Works 3 days/week at IoA and 2 at home with support from husband.
Prof. Richard McMahon	M	Professor of Astrophysics, Deputy Director, member of the academic staff committee, member of the senior management team. Will be Director from Oct 2017.	3 adult children. Was single parent for several years. Experienced challenge of balancing full-time work, travel and child care.
Dr. Ian Parry	M	Senior Lecturer, current SAT Chair, member of the academic staff committee.	One adult daughter and a 2 year-old son. Married to a material scientist who works full time at Imperial College.
Anjali Piette	F	Final year undergraduate student.	Has worked at the IoA as a summer student and participates in the IoA outreach programme.
Dr. Debora Sijacki	F	Reader, member of the academic staff committee	One son born June 2016, recently took maternity leave, returned Dec 1, 2016
Prof. Christopher Tout	M	Professor of Stellar Evolution, Chair Teaching Committee, member of the academic staff committee,	Especially concerned with E&D for students.
Prof. Mark Wyatt	M	Professor of Astrophysics, member of the academic staff committee	Father of 3 children (4-13 years old); married to a secondary school Assistant Principal

3.2 The self-assessment process

In the period from Mar 2016 to March 2017 the SAT met 10 times. This (on average more than one every 6 weeks) was driven by the large number of things that we needed to do.

AP3: *Hold frequent SAT meetings.*

The agenda is always very full and the meetings are typically one and a half hours long. Some of the bigger issues we have discussed are:

- Our Athena SWAN action plan.
- Our recruitment processes especially for tenured-staff.
- The design, implementation and analysis of our surveys of *all* people at the IoA.
- Unconscious bias training.
- An (ongoing) investigation into pay levels of female versus male postgraduate research assistants and research fellows.
- Creating and maintaining an Athena SWAN website.

- The resubmission of our application for a bronze award.

The meetings sometimes included our E&D consultant Joanna Jasiewicz and our Athena SWAN buddies Prof Val Gibson from Physics and Prof David Hodell from Earth Sciences.

The outcomes of the SAT meetings are reported to the Academic Staff Committee and Senior Management meetings as standing agenda items and initiatives actioned by these meetings are widely publicised to the entire researcher community, electronically and by Newsletter. All meetings are minuted.

The SAT chair attends the Athena SWAN forums of both the school of Physical Sciences and the University as a whole. These forums are a very valuable opportunity for us to learn from the experience of others and to spread the word across the University as to how we are doing. We are assigned Athena SWAN "buddies" through the School forum. These are SAT chairs from other departments with expert experience of the Athena SWAN process who give up some of their valuable time to help us at the IoA to make progress with our own Athena SWAN programme. Annual reports will also be provided to the University E&D Committee and SAT members engage with termly University Athena SWAN Network events. The Departmental Secretary (who is a member of the SAT) regularly attends and reports progress to The School of Physical Sciences E&D Committee.

AP2: *Encourage SAT members to engage with University Athena SWAN Network events.*

The SAT has recently designed and conducted two surveys to get feedback from *all* members of the IoA. The first was aimed at postgrad students, postdocs, fellows, academic staff and support staff. 167 people were invited to complete the on-line survey and 116 responded (69.5%). The second survey was aimed only at our undergraduate students (20 3rd years and 35 4th years). We survey the undergraduates separately because many of the questions in the first survey were irrelevant to them (for example questions about promotion, etc.). The SAT has studied the results of these surveys, reflected on what they tell us and identified actions which we can take in response.

The SAT regularly monitors progress on our action plan and adds extra items in response to new information and events. The SAT has taken an active role in initiating our IoA Athena SWAN Webpages and assessing the content of the whole IoA website.

Our SAT receives very valuable external help and support. The SAT's E&D consultant (Joanna Jasiewicz) gives advice on the Athena SWAN process and provides data on which to base our self-assessment. Our Athena SWAN buddy is Prof. Val Gibson (Physics – Athena Swan gold) who has vast experience of the Athena Swan and IoP-Juno processes and offers her excellent advice on all related matters. Prof. David Hodell from the Department of Earth Sciences was an extra Athena SWAN buddy. In some ways Earth Sciences is a similar department to the Institute of Astronomy and so David's perspective was very valuable.

SAT members also participate in relevant events outside the Institute of Astronomy, both within and outside the University. For example, the Institute is funding Dr. Halabi to attend the international event "Women in Astronomy 4"

in Texas in June. Other examples include unconscious bias sessions and training sessions for creating action plans.

3.3 Future plans for the SAT

The SAT will continue to meet frequently and regularly. We will continue to monitor progress on the action plan and check to see if the success measures have been met. All IoA members will be strongly encouraged to complete the new survey questionnaires once per year so that changes (hopefully progress) can be monitored.

AP4: *Issue annual questionnaires to all individuals at the IoA (staff and students).*

The SAT meetings will continue to be minuted and reported to the academic staff committee and the senior management team. Regular updates will also be sent to all IoA members via email, the website and the IoA newsletter.

From time to time members will leave the SAT and they will be replaced by new members. Calls for members will be made by email and by directly encouraging individuals who it is thought will make a significant contribution. Recruitment is not limited to replacing people who leave the SAT – we are happy to include anyone who volunteers and can contribute at any time.

AP1: *Maintain membership of the SAT.*

Word count: 997 words.

4. A PICTURE OF THE DEPARTMENT

4.1. Student data

(i) Numbers of men and women on access or foundation courses

n/a

(ii) Numbers of undergraduate students by gender

At Cambridge, undergraduates are admitted by one of the 31 autonomous colleges. Departments have no control over the entry to a specific course. Further details will be provided to the panel. The IoA, therefore, has no direct control over the selection of undergraduates to the 1st and 2nd year courses. However, one of the aims of our outreach programme is to inspire science students to apply to Cambridge. Further details can be found in the outreach section of this application (section 5.4 (viii)).

The IoA hosts 3rd and 4th year undergraduate courses in astrophysics. Students entering the 3rd year course have studied Mathematics or Physics in the previous two years. Students entering the 4th year course have studied Mathematics or Physics or Astrophysics in their third year. A well-advertised annual Introductory session informs 2nd/3rd year students currently studying Mathematics or Physics of the possibility of studying Astrophysics in the following academic year and we offer them impartial academic advice about their options. At the end of the 3rd year, some of the students graduate and leave while others, if they attain a threshold 2:1 in their 3rd year exams, may proceed to the specialised 4th year course. The numbers of students on this 4th year course are further supplemented by suitably qualified students who have previously studied Physics or Mathematics at another University. Although there is overlap of the cohorts in the 3rd and 4th year courses in successive years, the admission criterion for the 4th year course means that the spectrum of ability and attainment is different in the two years.

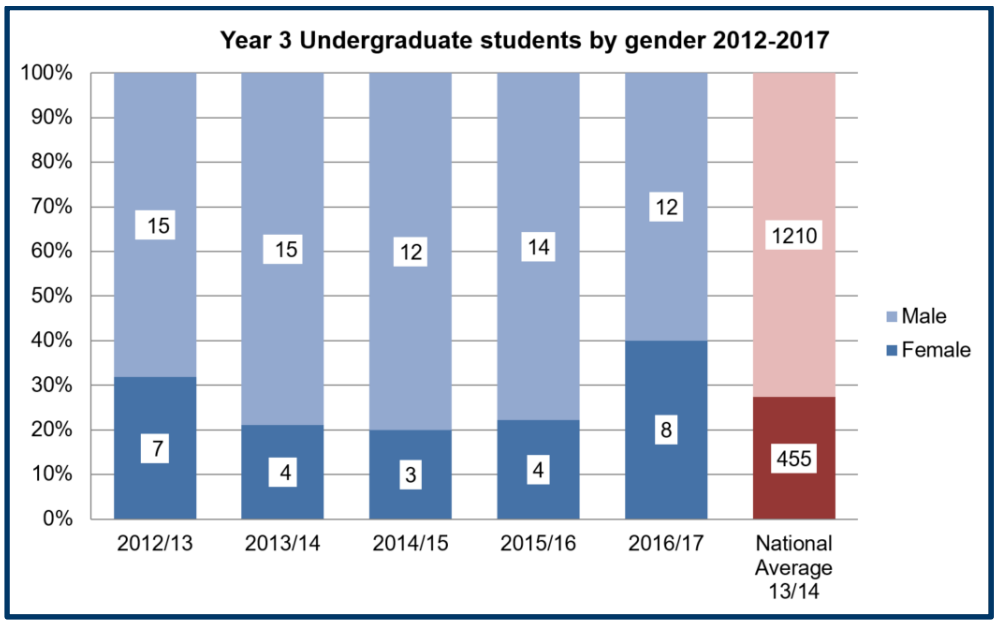


Figure 4.1: *Numbers of undergraduate IoA astrophysics students in the 3rd year by gender over a 5 year period compared with national averages.*

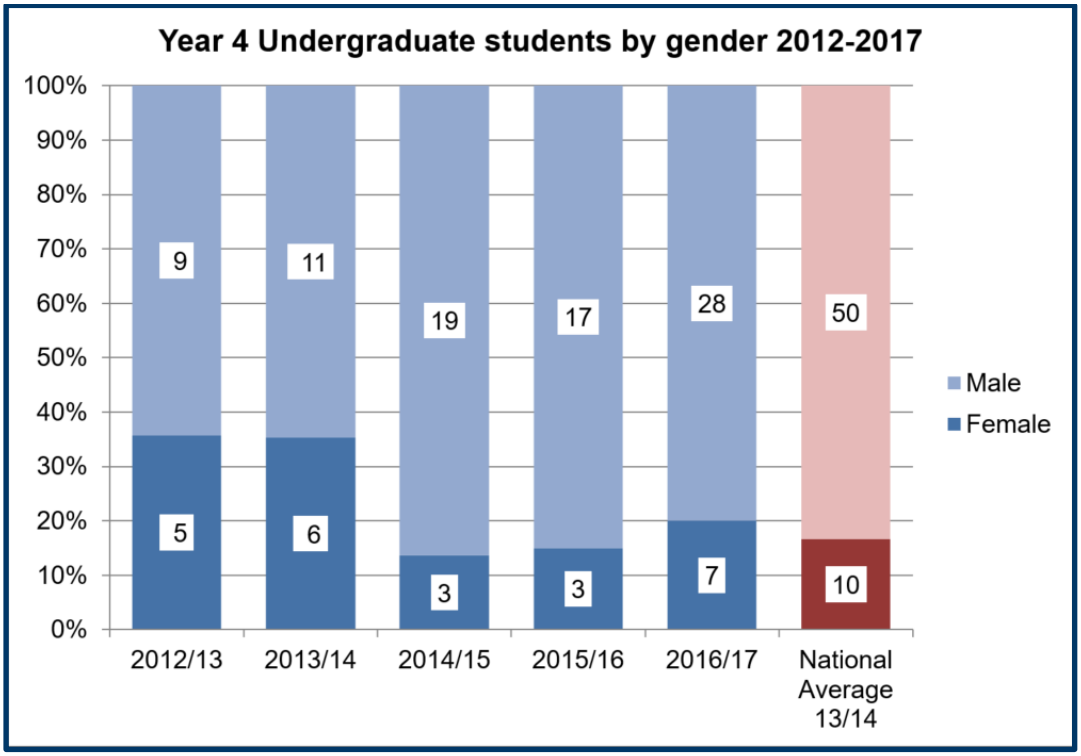


Figure 4.2: *Numbers of undergraduate IoA astrophysics students in the 4th year by gender over a 5 year period compared with national averages.*

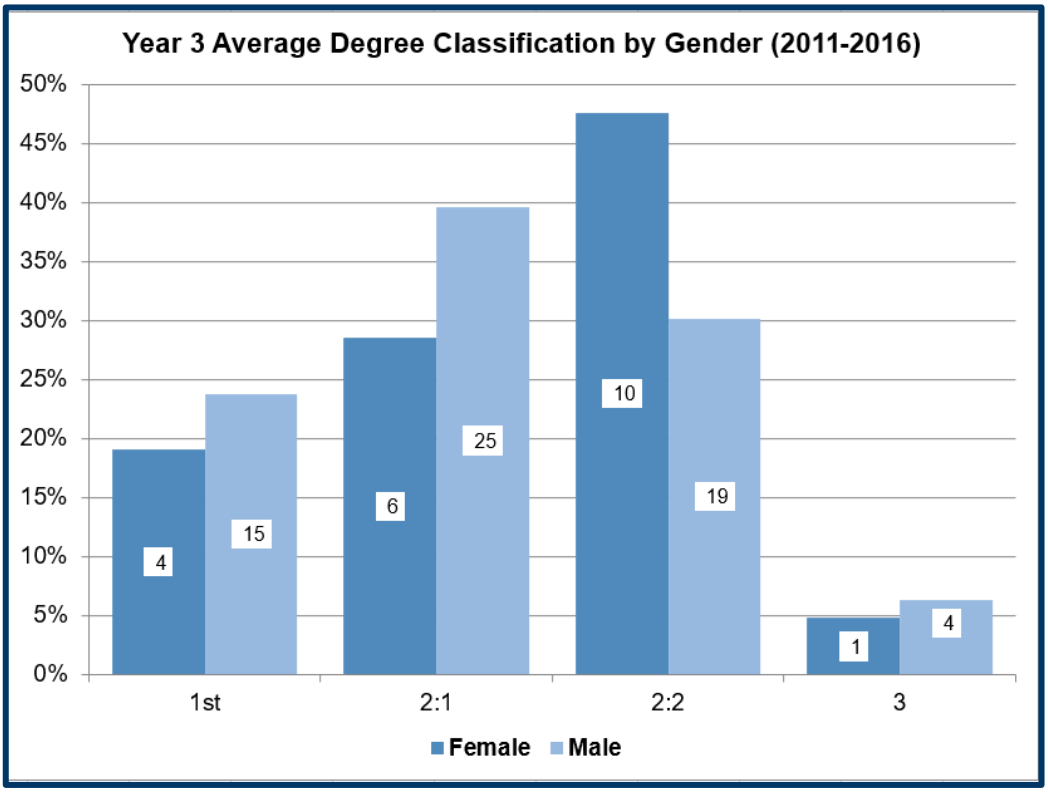


Figure 4.3: Percentage of year 3 IoA astrophysics students attaining each degree class (female: dark columns, male: light columns) *averaged over 5 years (2011 – 2016). Each column is labelled by the total number of individuals, by gender, gaining each degree class over this period.*

The small number of undergraduate students studying astrophysics (Figs 4.1 and 4.2) means that the proportion of women is heavily impacted by inclusion or loss of a single female student. In the current 3rd year, the fraction of female students is 40%, and the corresponding figure for the 4th year is 20%. The national average for the discipline is 27%.

Student feedback from undergraduates (through formal questionnaires and informal routes) shows that the IoA is valued as a friendly environment in which female undergraduate students feel very comfortable (see quotes under "Culture").

In the 3rd year course, the performance of women is broadly similar to that of men. The IoA Teaching Committee considers student performance data annually (including performance by gender) and takes great care to assess whether there are statistically significant trends that should inform our future teaching and examination provision. Our analysis demonstrates that the differences seen in the graph are not statistically significant given the size of the sample involved (84 students, 63 male and 21 female). The performance of male and female students in the 4th year is also statistically indistinguishable. We will of course continue to make sure everything is fair by monitoring these figures and checking informal/formal feedback that students (both female and male) are satisfied with their learning environments.

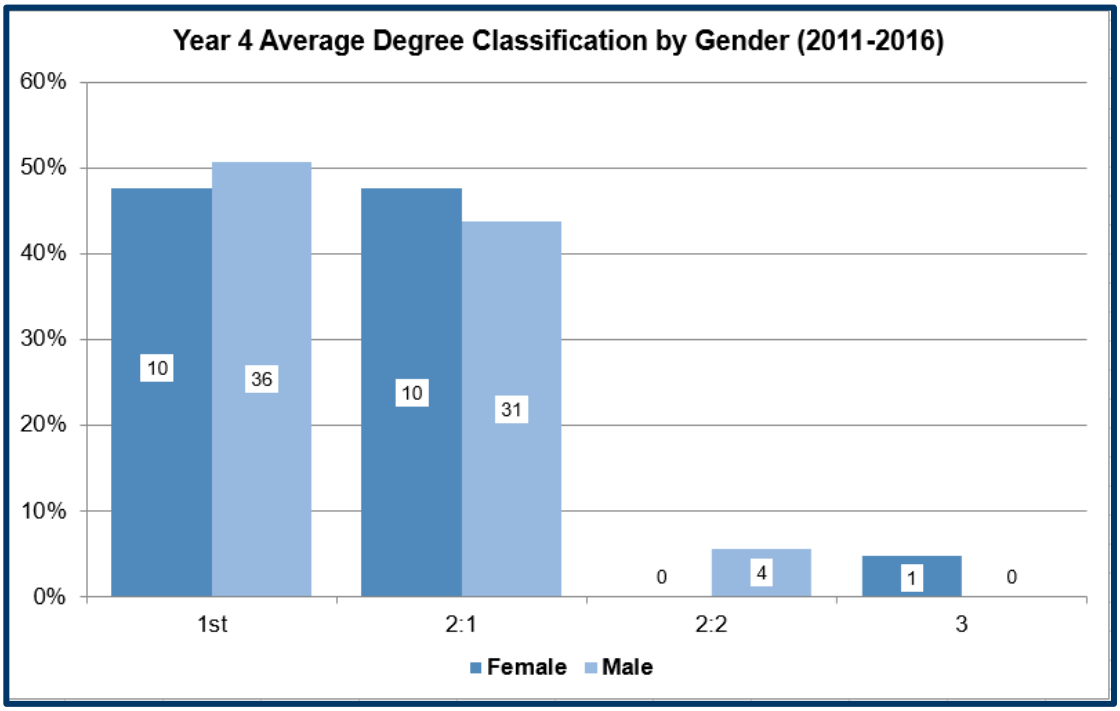


Figure 4.4: *Degree classification averaged over 5 years (2011 – 2016) for year 4 IoA astrophysics students. Each column is labelled by the total number of individuals, by gender, gaining each degree class over this period.*

Figure 4.4 shows a better performance of students in the 4th year course compared to the 3rd year course. This is a result of the imposed entrance threshold of 2:1 at the end of the 3rd year.

We have also looked at how well students progress once they arrive on our 3rd year course. Our data and analysis are presented in tables 4.1, 4.2 and 4.3. This

clearly shows that both men and women make significant progression but there is no evidence for a gender imbalance.

Table 4.1: *2nd year grades of students entering the astrophysics 3rd year course over 6 years (78 men and 26 women).*

	3rd	2.2	2.1	1st
Men	13 (17%)	21 (27%)	34 (44%)	10 (13%)
Women	7 (27%)	7 (27%)	8 (31%)	4 (15%)

Table 4.2: *Grades of students completing the astrophysics 3rd year course over 6 years (78 men and 26 women).*

	3rd	2.2	2.1	1st
Men	4 (5%)	25 (32%)	29 (37%)	20 (26%)
Women	2 (8%)	11 (42%)	8 (31%)	5 (19%)

Table 4.3: *Average progression of students completing the astrophysics 3rd year course over 6 years (78 men and 26 women). Progression is defined to be the number of classes risen from one year to the next. For example, a student entering with a 3rd class in the 2nd year and achieving a 2.1 in the astrophysics 3rd year has a progression of 2. The columns labelled* ± indicate the uncertainty in the progression value.

	Men		Women	
	Progression	±	Progression	±
3rd	1.0	0.15	0.71	0.17
2.2	0.3	0.13	0.45	0.14
2.1	0.12	0.1	0	0.25
1st	0		-0.25	0.19
Overall	0.31	0.08	0.37	0.13

(iii) Numbers of men and women on postgraduate taught degrees

n/a

(iv) Numbers of men and women on postgraduate research degrees

The number of taught MPhil students at the IoA is very small (4 female, 3 male over 5 years (as at Nov 2015)). This is because the standard academic progression route in astrophysics is from undergraduate to PhD programme and few students (mainly from the USA) bridge these stages with an MPhil qualification.

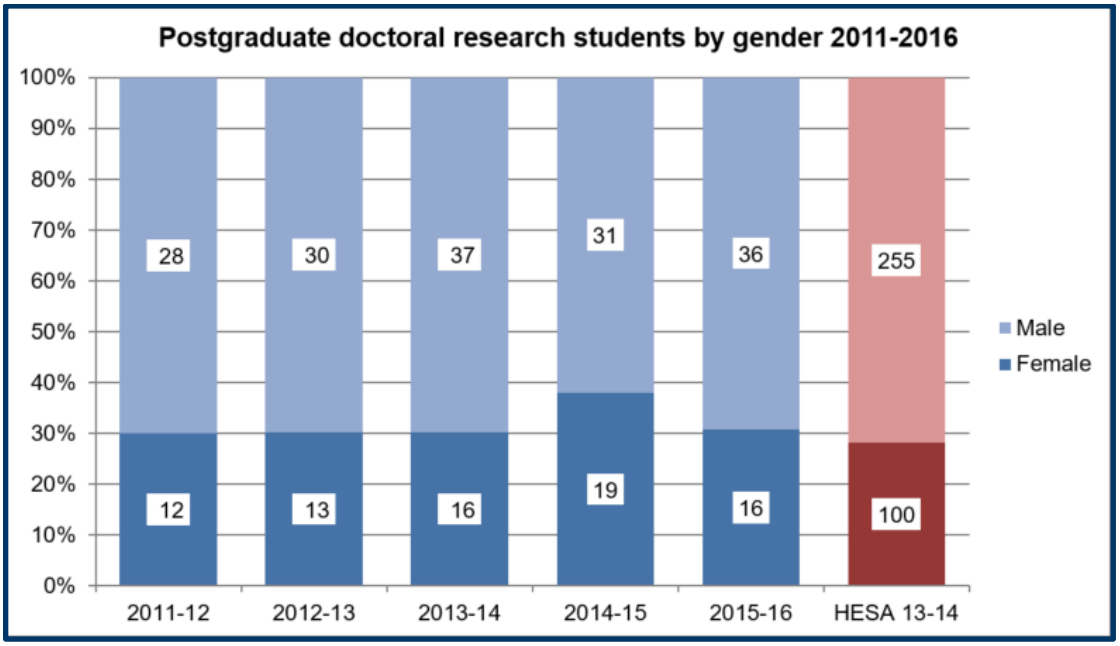


Figure 4.5: *The composition of the IoA's doctoral students by gender over a five-year period compared with national data.*

The fraction of women among PhD students has remained stable at ~30% for many years, similar to the national average and also to the fraction of female students among undergraduates in relevant subjects. Adopting an evidence-based approach we have not attempted to systematically enhance the fraction of females admitted as the proportion reflects the pool of eligible candidates. Nevertheless, we try to take into account possible gender based/cultural differences that might skew our admissions procedure (see **(v)** below).

(v) Progression pipeline between undergraduate and postgraduate student levels

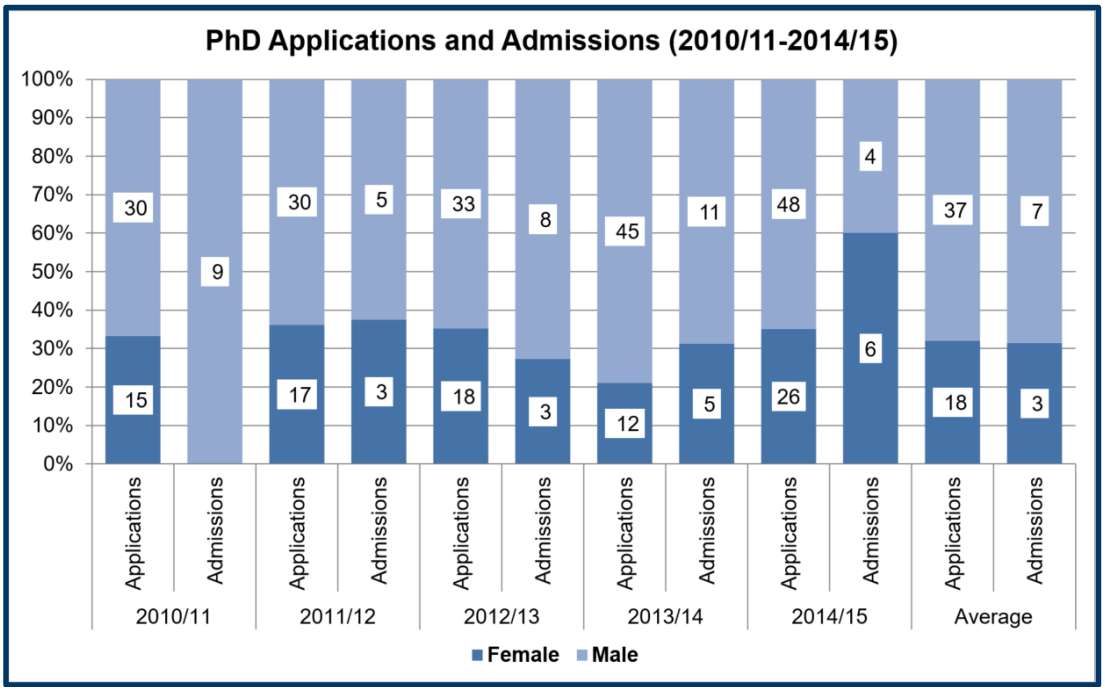


Figure 4.6: *Applications and admissions to PhD programme at the IoA by gender. The numbers fluctuate from year to year in line with the small numbers involved but the fraction of women among those admitted is in line with the fraction of women among those applying.*

The number of PhD students admitted fluctuates (from 8 to 16 students per year over a 5 year period) in line with the availability of postgraduate studentships. The fraction of female students admitted also fluctuates at a level consistent with the small numbers involved. Over 5 years, the fraction of females among applicants (95/300, i.e. 32%) was statistically indistinguishable from the fraction of females amongst those admitted (17/57 ,i.e. 30%) and higher than the national proportion of women in either Physics (22%) or Maths (27%). We regularly review our admissions procedures and take care that the format and conduct of the interviews does not disadvantage particular groups of candidates. The interview panel always includes at least one woman and all members are required to take the University's Equality and Diversity training module. These panels will be required to complete *Understanding Unconscious Bias* training being rolled out by the University.

AP24: *Require recruiters and line managers to take University E&D training*

AP25: *Require recruiters and line managers to take Unconscious Bias awareness training*

4.2. Academic and research staff data

(i) Academic staff by grade, **contract function** and gender: research-only, teaching and research or teaching-only

Table 4.4: *Distribution of academic and research staff by grade and gender at the IoA in April 2017*

Grade	# M	% M	# F	% F	# Total
Professor	10	91%	1	9%	11
Reader	3	75%	1	25%	4
Senior Lecturer	1	100%	0	0%	1
Lecturer	1	100%	0	0%	1
All tenured staff	*15*	*88%*	*2*	*12%*	*17*
Fellows	8	73%	3	27%	11
Postdocs	42	76%	13	24%	55
Totals	64	77%	19	23%	83

All tenured academic staff combine research and teaching. All fellows and postdocs are employed to do research although many do teaching.

The IoA permanent (tenured) academic staff currently numbers 17. Three of these posts will not be renewed when the post holders retire (one next year, one no later than 2019 and one no later than 2026). The large professoriate (11 out of 17) is mainly due to individuals (8) being successful in the University's promotion procedure which has clear criteria based on research, teaching and general contribution. Two of our professors were appointed directly from outside the University to named Chairs and one was awarded a highly prestigious Royal Society Professorship. The large professoriate also, to some extent, reflects the age distribution of the tenured staff.

A further consideration is that tenured academics at the IoA have high job satisfaction and typically do not look for career advancement by moving to another department.

There is a relatively large population of 66 non-tenured researchers whose numbers have grown by about 50% over the last 5 years.

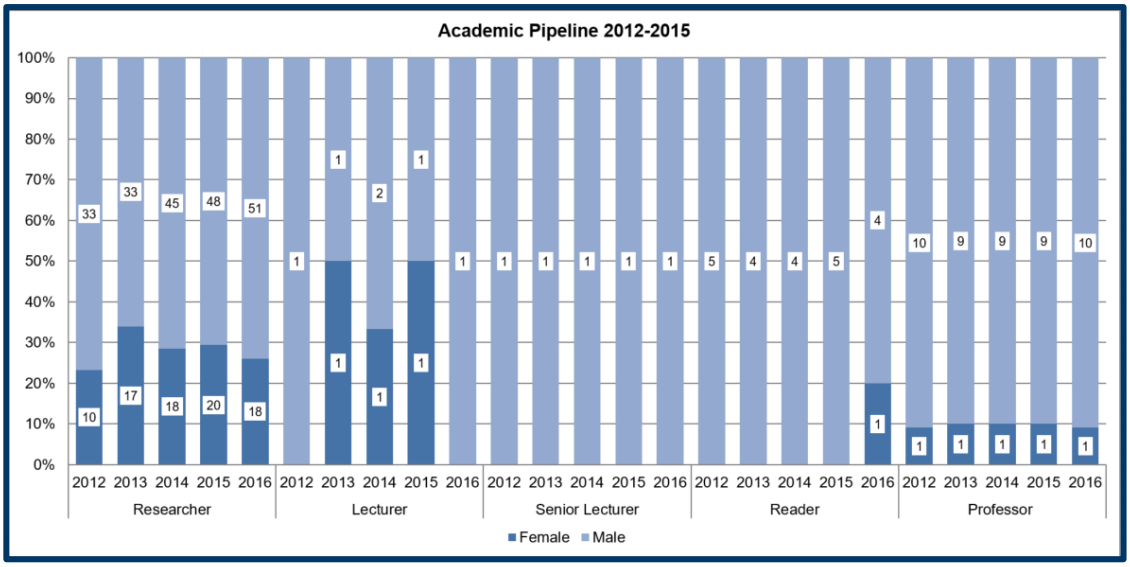


Figure 4.7: *The academic pipeline at the IoA, 2012-2016. For each year and category, the total number of women and men are labelled in the dark and light blue columns whose height is adjusted to give the percentage by gender in that category.*

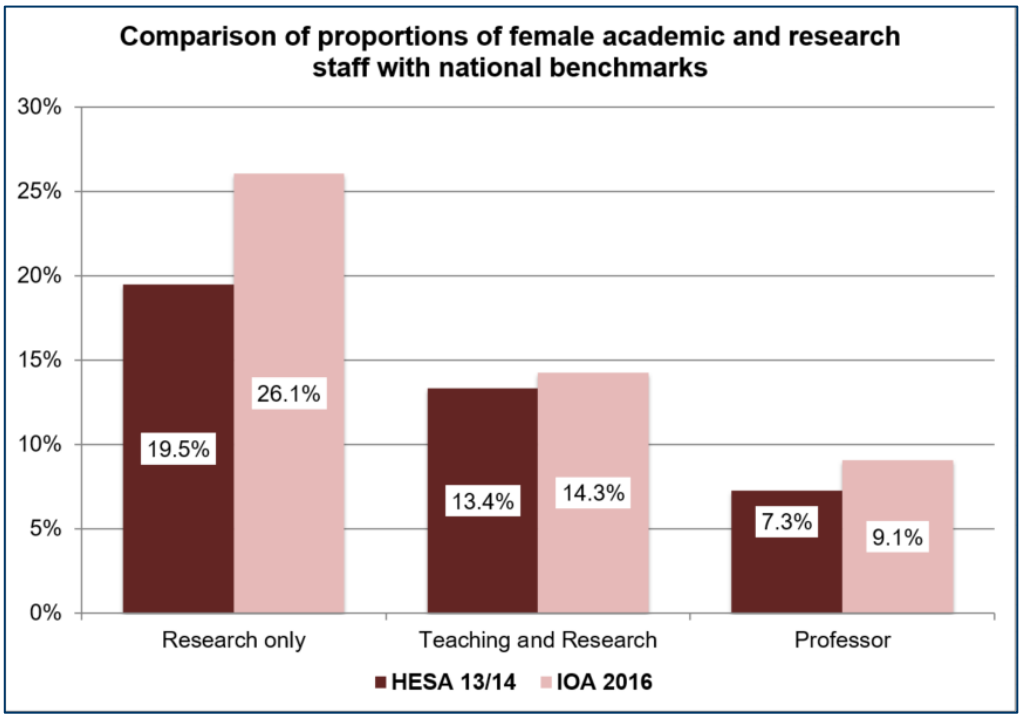


Figure 4.8: *The fraction of women in the three categories `Research only' (i.e. untenured postdoctoral research staff), `Teaching and Research' (tenured Lecturers, Senior Lecturers and Readers) and `Professors' at the IoA compared with national benchmarks*.

Amongst (non-tenured) researchers the fraction of females is 30% (5 years' data, total cohort of 269) which clearly exceeds the national benchmark for Physics (19.5%) and is also similar to the fraction of females in the postgraduate population. This is however not necessarily a meaningful comparison because graduate students generally depart to national/international destinations after their PhDs while researchers are recruited from a variety of national/international institutions. We have therefore also analysed what is the

fraction of women amongst our graduating PhDs that continue in academia since we routinely track postgraduate student destinations. Using 4 years of data (62 students) this fraction is 29%, indistinguishable from the typical fraction of females in the IoA's PhD student population (~30%). Thus despite the worry about the prospects for combining family life and an astronomical career, women are not preferentially leaving the field following the completion of a PhD at the IoA.

The fraction of females among tenured academic staff (2 out of 17 = 12%) is consistent with national benchmarks given the small numbers. This also shares, with national benchmarks, a notable fall (by a factor ~ 2-3) compared with the fraction of females among untenured researchers. There is clearly an issue here and it is one we share with other departments across the country. Possible reasons for this are:

- Many of the current tenured staff received their permanent contracts many years ago and turnover for tenured staff is very slow for the reasons given above so the gender balance still shows the effects of appointment procedures from many years ago.
- Women are more likely to pull out at this transition point because of work/life balance issues.
- Unconscious bias in the appointment process.

The IoA is therefore keen to increase the number of women at tenured level. Appointment committees are required to take the University's Equality & Diversity training module, and also Unconscious Bias training when available and always include female members.

AP24: *Require recruiters and line managers to take University E&D training*

AP25: *Require recruiters and line managers to take Unconscious Bias awareness training*

The biggest challenge is however attracting female applicants to apply. Staff members are urged to publicise academic jobs widely and to encourage applications from female candidates in their fields. Discussion of gender does not influence the decision-making beyond this point although - as also in the case of male applicants - consideration is given to how personal circumstances may have affected productivity over a limited period. In our experience it has been difficult to attract suitably qualified women to the IoA because of the problem of those in dual career relationships which, as noted above, affects women disproportionately. The experience of other institutions worldwide is that recruiting top female scientists may require Universities to offer packages to both partners. The IoA, a small department where permanent jobs are available only at intervals of several years, lacks the flexibility to offer such packages. Options (e.g. lobbying for a University mediated scheme offering bridging funding for partners) will be explored under **AP36**.

AP36: *Investigate University and other funding options regarding hiring those in dual career academic relationships*

(ii) Academic and research staff by grade **on fixed-term, open-ended/permanent and zero-hour contracts** by gender

Table 4.5 gives the numbers, by gender, of academic and research staff on permanent contracts (tenured academic staff) and on fixed-term contracts (non-tenured academic staff). The data is for April 2017.

Among those on permanent contract, the fraction of women (12%) is lower than the fraction of those on fixed term contracts that are women (24%) and we are taking steps to increase the proportion of women academics on permanent contracts (see section 5.1 (i)). This discrepancy is not unique to the IoA: in the UK 13% of permanent academic physics posts are held by women whereas 19.5% of fixed-term astrophysics contracts are held by women.

Continuity of employment for the 51 non-tenured staff varies from individual to individual. Some key personnel are kept by issuing new fixed-term contracts funded through grant renewals or grant extensions or departmental bridging funds. At the other end of the spectrum postdocs simply do their fixed-term contract and then leave to get another position elsewhere. In this latter case the individual usually makes good career progression because their time spent at the IoA has been valuable.

We do not have any academic and research staff on zero-hour contracts.

Table 4.5: *Distribution of academic staff by contract type and gender at the IoA in April 2017*

	# M	% M	# F	% F	# Total
Tenured Academic Staff	*15*	*88%*	*2*	*12%*	*17*
Non-tenured Academic Staff	50	76%	16	24%	66
Totals	64	77%	19	23%	83

(iii) Academic leavers by grade and gender and full/part-time status

Most postdocs and fellows leave during or at the end of their fixed-term contract. Turnover is shown in figure 4.9. For researchers on fixed-term contracts the turnover is ~20% for both males and females consistent with the fact that the typical employment pattern in astronomy consists of 3 year postdoctoral contracts.

The turnover is extremely low for academic staff. In the last 15 years, 6 tenured academic staff have retired and 3 have left to take up other positions. All 9 were men. Only one male academic retired and one left for another position overseas over the period covered in figure 4.9.

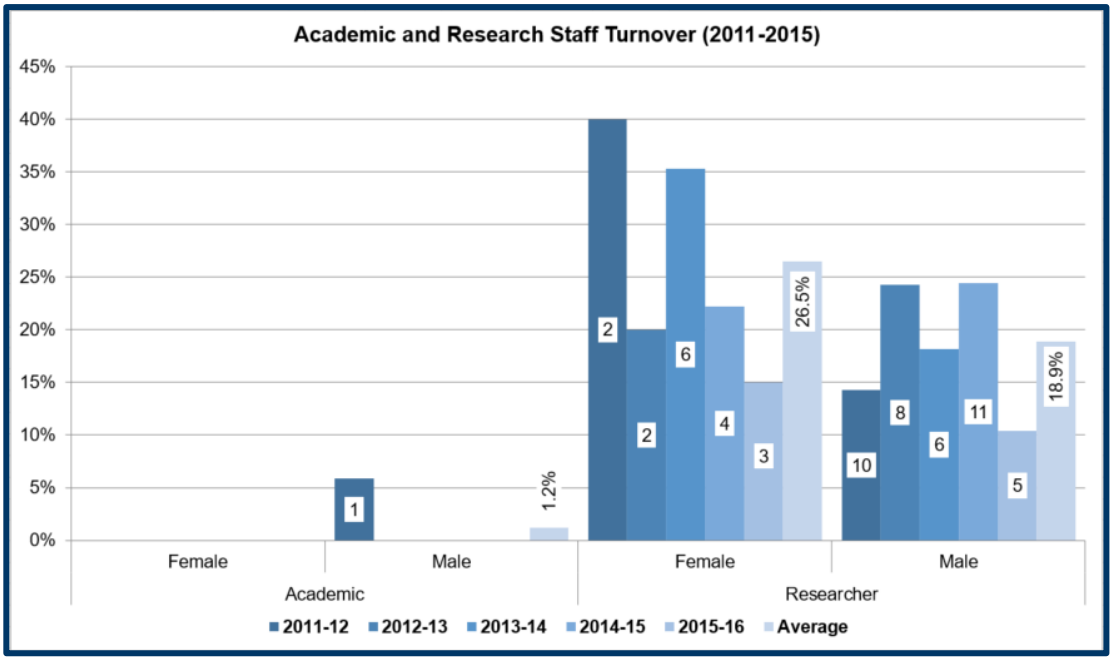


Figure 4.9: *The number of individuals leaving the IoA, by gender and staff category, colour coded by year of departure. The vertical axis (i.e. turnover) gives these numbers as percentages of the total number of staff, by gender, in each category for that year. The percentages in the body of the graph are five year averages for each category.*

Word count: 1819 words

5. SUPPORTING AND ADVANCING WOMEN'S CAREERS

In the past year, 12 of our researchers on fixed-term contracts have been offered permanent academic positions worldwide. Four of these (33%) were women, with the same success rate for women as for men, a rate rarely matched in the field worldwide. The last 6 permanent academic staff appointments at the IoA were made to members with 4 different nationalities/ethnicities, with 17% women and 17% BME. Of the last six prestigious Eddington prize lectureships awarded yearly by the IoA, 50% were made to distinguished women scientists worldwide. In recent years, the IoA has played a particularly active role in encouraging women and minorities in STEMM subjects. In the latest PhD admission cycle, 43% of the PhD studentships funded by the UK STFC were made to outstanding women applicants. Beyond the high profile in the scientific community, the IoA plays an active role in public engagement thanks to a very vibrant astronomy outreach programme led by a distinguished woman astronomer. The priorities of gender equality and diversity at the IoA are pursued proactively and organically in tandem with maintaining a large and comprehensive research programme in a diverse multicultural environment.

In this section we discuss all career stages at the IoA. Table 5.1 explains the definitions we use.

Table 5.1: Definitions

Tenured	A tenured position is one where the post-holder has a contract that ends with retirement.
Non-Tenured	A non-tenured position is one where the post-holder has a fixed end-of-contract date.
Researcher	A person employed to primarily do research and teaching, i.e. an academic.
Support-staff	A person whose main role is to support the activities of the researchers. These people can also be called non-academics.

5.1. Key career transition points: academic staff

(i) Recruitment

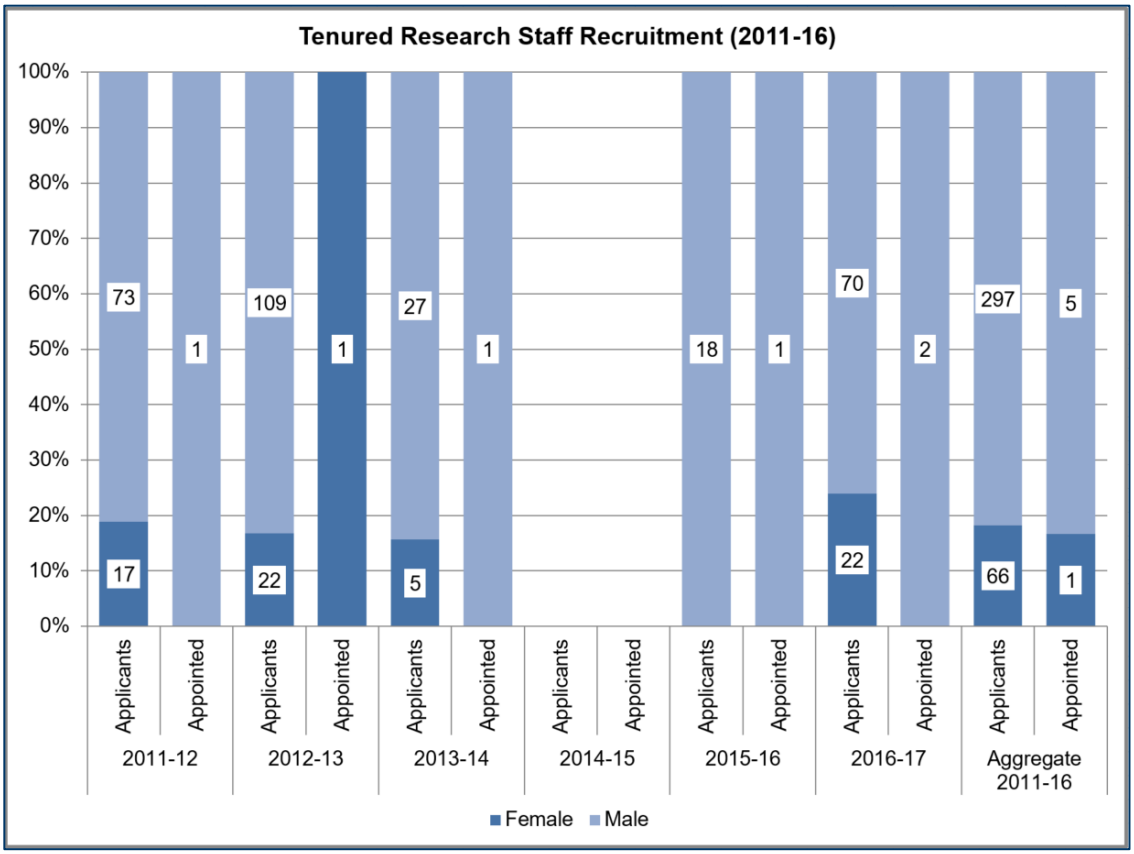


Figure 5.1: *The gender breakdown of applicants and appointees for tenured research staff for the academic years starting in 2011-2016. The appointment in 2015-16 was the Plumian Chair which was at the professorial level. The other 5 were made at the lectureship level. There was no recruitment exercise in 2014-15. Both lectureships in 2016-17 were joint appointments with other departments (Earth Sciences and Statistics).*

All scientific positions (tenured and non-tenured) within the IoA are widely advertised both nationally and internationally; the majority of applicants respond to advertisements in the online Job Register of the American Astronomical Society. Informal "encouragement to apply" is important for attracting the strongest and most diverse field of applicants; senior staff are requested to be particularly mindful of identifying and notifying female applicants (**AP46**). The IoA does provide an excellent environment for female researchers as evidenced by responses from females to our survey question - *What is the best thing about working at the IoA?*

"The support I receive to carry out my job effectively, and the flexibility I have been given to achieve a good work/family life balance."

"The environment where by staff in higher positions do not talk down to you. Everyone converses as if they are on an equal footing."

"It's a tremendously supportive community"

We are currently reviewing the wording of job advertisements and the additional material that we provide to convey this accurately (**AP20, AP22, AP23**).

AP46: *Encourage senior staff to invite suitable female applicants to apply for advertised research positions.*

AP20: *Review advertising process for new vacancies including gender neutral criteria and wording of adverts.*

AP22: *Review and revise available material for recruitment/induction.*

AP23: *Gather information about local nursery provision/school catchment areas and make details easily accessible.*

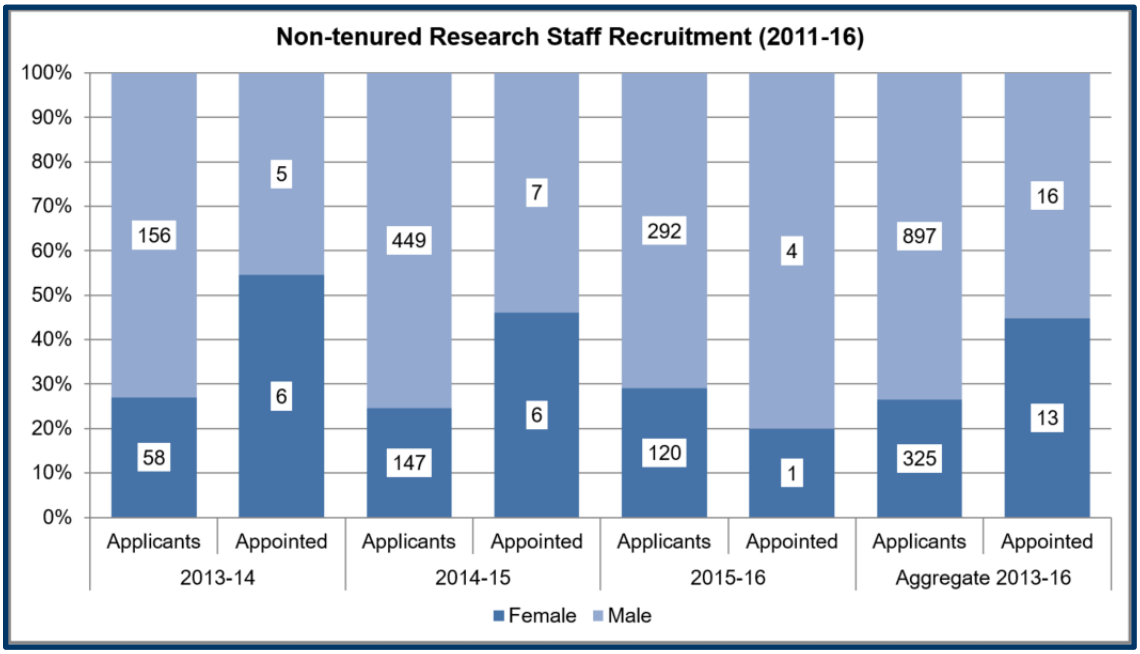


Figure 5.2: *The gender breakdown of applicants and appointees amongst non-tenured research staff over the period 2011-2016. Note that figures for non-tenured researchers are only available from 2013-14.*

The selection process involves grading of individuals against pre-selected criteria by a committee whose size depends on the level of appointment. Since 2014 the IoA Management team has required that all those involved in selection and managing personnel should complete the University's on-line Equality and Diversity Training (**AP24**) and we also take advantage of the University's Unconscious Bias workshops and will use the on-line unconscious bias training (**AP25**). In the case of appointment to tenured positions there is always female representation on the committee (which also includes a member external to the department). The recommendation of the departmental selection committee is then scrutinised by higher level committees so there are multiple stages at which the fairness of the process is checked.

AP24: *Require recruiters and line managers to take University E&D training*

AP25: *Require recruiters and line managers to take Unconscious Bias awareness training*

Recruitment at the IoA for non-tenured research positions

The number of well qualified female applicants is affected not only by measures put in place around the recruitment process but by the over-all quality of the working environment, on a world-wide scale, during the postdoctoral years. As a leading institution which performs a training role for large numbers of postdoctoral researchers who go on to populate the faculties of many countries, we are in a good position to try and set high standards in this area. In 2013 the University established an Office of Postdoctoral Affairs to specifically support this community, including representation on senior University Committees. Many of the actions in our action plan improve the support and information given during the postdoctoral years and are designed to address this issue.

AP5: *Run open workshop with role models (monitoring attendance by gender)*

AP6: *Host HR-led presentations/workshops on shared parental leave and other policy developments*

AP21: *Create and operate an Astro-Postdoc committee.*

AP26: *Introduce a pilot scheme where the IoA underwrites a contract extension for researchers who took maternity leave or shared parental leave.*

AP27: *Interview all returning carers*

AP28: *Identify existing returned carers willing to provide information and support to new returners and facilitate liaison between them*

AP29: *Provide information on KIT days/ graduated return options/Returning Carers' Scheme etc.*

AP30: *Publicise paternity leave regularly by newsletter*

AP31: *Request notification of paternity*

AP32: *Publicise shared parental leave policy by newsletter, email circulation, HR presentation and in induction pack*

AP33: *Publicise Returning Carers' Scheme*

AP34: *Identify mentors for those wishing to apply to Returning Carers Scheme*

AP35: *Review further cost-effective measures and funding sources to facilitate academic travel for carers (e.g. to pay for childcare).*

AP36: *Investigate University and other funding options regarding hiring those in dual career academic relationships*

For non-tenured researchers, the fraction of female applicants over the period 2013-2015 was 26%, while the fraction of females among those appointed was 29%. This consistency is encouraging as is the fact that the fraction of female applicants is only slightly below the fraction of postgraduate students that are female (~30 %). This suggests that attrition is fairly mild between the PhD student and researcher stage. Referring to figure 4.8, it appears that the IoA is doing better than the national average fraction of non-tenured female researchers (19.5%) and we will continue to monitor this and maintain our good position through our action plan.

Recruitment at the IoA for tenured research positions

In the last 6 years we have recruited 5 tenured researchers at the lectureship level (1 female and 4 males) and one 1 male tenured researcher at the professorial level (see figure 5.1).

Applications: For the recruitment of tenured academic staff, the fraction of female applicants is lower (18% for the last 6 hires) than the fraction of non-tenured IoA researchers (16/66=24%). We acknowledge that the numbers are small but we have considered possible reasons for this so we could take action to make the process as fair as we possibly can. One possible explanation is that the fraction of women in non-tenured research positions worldwide (from where the applications come from) is lower than the number for the IoA. This is true for the UK (the fraction is 19.5%: see figure 4.8) but not true for the US where the number of female astronomy postdocs is 28%. Also, our experience has been that male candidates have been more likely to put in speculative applications whereas women appear to be pursuing more realistic strategies and this will tend to skew the candidate gender ratios. The fact that there are *strong* female applicants is consistent with the fact that one female lecturer was appointed.

However, we must also examine possible reasons for women not applying to our positions. These must include the likelihood that some are deterred by the logistical difficulties of taking up the post in a context where this may require negotiation with a partner with competing career development needs. A longer term ambition in our Action Plan is to explore within the University how a small department such as ours can help mitigate these effects through possible bridging funding for academic partners.

AP36: *Investigate University and other funding options regarding hiring those in dual career academic relationships*

A more immediately achievable goal is to review our recruitment material and to ensure that job advertisements highlight information concerning achieving work/life balance in Cambridge

AP20: *Review advertising process for new vacancies including gender neutral criteria and wording of adverts.*

AP22: *Review and revise available material for recruitment/induction*

AP23: *Gather information about local nursery provision/school catchment areas and make details easily accessible*

Short-listing and appointments: For the last 6 positions we shortlisted 34 candidates in total and 6 of these were female (18%). Again we stress that the numbers are small and it is difficult to draw firm conclusions but both the appointment rate (17%) and the shortlisting rate (18%) are consistent with the application rate of 18%.

To be sure that we are proactively promoting equality the SAT has added specific actions to our action plan.

AP38: *Write to appointment committee chairs to be mindful of unconscious bias and to request that female candidates are appropriately represented on the short-list.*

AP39: *Ensure there is some representation of the IoA SAT on all appointment committees*

AP56: *Form a continuously active search committee to identify and engage with strong scientists who might consider moving to a tenured position at the IoA.*

We expect to make 4 or 5 new tenured appointments over the next 10 years.

The last two appointments were made after we created actions **AP38** and **AP39**. For one, all three IoA selection committee members are on the IoA's SAT and are members of the IoA's staff committee. For the other there were 2 IoA members, both were members of the IoA Staff Committee and one was a member of the IoA Athena SWAN SAT. The IoA Director wrote to the selection committee chairs urging the committees to be mindful of unconscious bias and that female candidates should not be underrepresented on the shortlists. For these last two appointments there were 11 candidates on the shortlists and 4 of them were female.

Recruitment of IoA researchers on fixed-term contracts by external employers

Figure 5.3 shows statistics for the types of job positions obtained by the 31 fixed-term contract academics who left the IoA over the last 2 years. Ten of the 31 moved to permanent academic positions showing that the IoA is good at advancing careers of astrophysicists. The numbers also appear to show that advancement is equal for both men and women. In the next few months 4 more (2 men and 2 women) will also move to permanent academic positions.

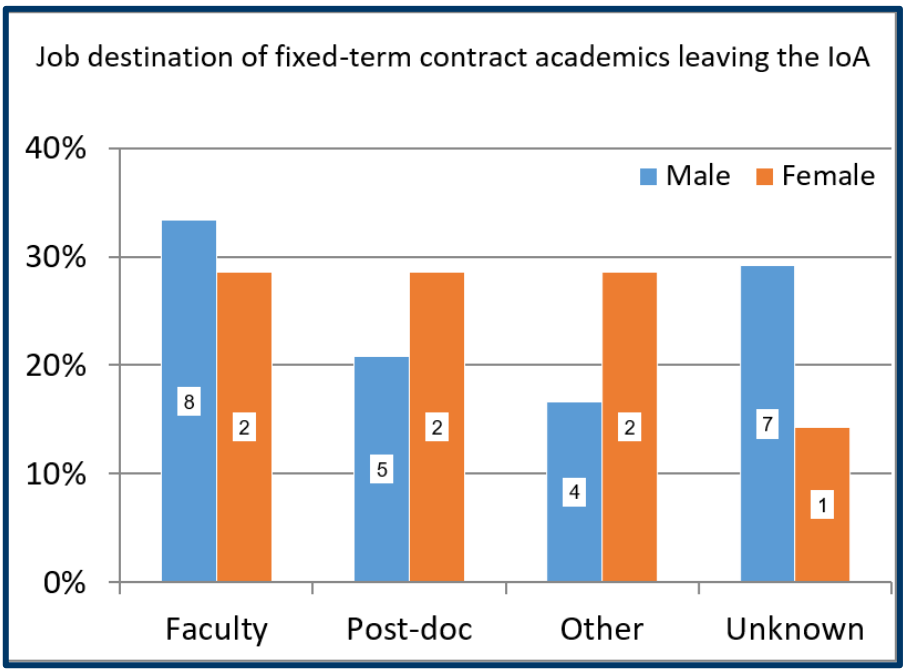


Figure 5.3: *The type of next job for the 31 non-tenured academics who left the IoA over the period March 2015 to Feb 2017. "Faculty" indicates a permanent academic post whereas "Post-doc" indicates another fixed-term contract.*

(ii) Induction

New postdoctoral researchers receive an induction package detailing a variety of practical matters whose contents are explained by the HR Administrator. In addition, they are assigned a `mentor' (fellow postdoc.) who is charged with offering informal advice and help. Incoming female researchers will in future be encouraged to approach either of the two female permanent academic staff members if they wish to discuss any issues with a fellow female scientist (**AP51**).

AP51: *Encourage incoming female researchers to meet with at least one of the female tenured academic staff.*

The postdoctoral researchers are addressed annually by the Director in order to keep them informed about strategic developments within the IoA and to introduce the Deputy Directors in order to make explicit the role of women in running the IoA.

AP52: *Director introduces deputies (including female deputy director) to all staff & student cohorts at introductory talks at the start of the academic year.*

The small size of the tenured staff means that new faculty members have frequent contact with the rest of the academic staff. All staff are regularly informed of a wide range of personal development courses that are available in the University; a discussion of how much an individual has made use of these resources and how they might benefit from future participation is a standard item during appraisals. In the Staff Survey, 63% of IoA respondents reported that their local induction gave them the information they needed to do their job effectively. Although this figure is significantly (21%) higher than for the School over all, we are nevertheless reviewing our induction material, specifically with regard to how information about flexible working opportunities and commitment to Athena SWAN is publicised (**AP22**).

AP22: *Review and revise available material for recruitment/induction.*

AP18: *Send welcome letter sent to all incoming researchers/students.*

AP40: *Compile information pack and give it to people before they arrive.*

(iii) Promotion

Annually, the management team (Director and two deputies) consider the readiness of all academics to apply for promotion and encourages timely applications particularly where candidates have not put themselves forward. Advice on preparing for promotion applications is given during staff appraisals and criteria for promotion are advertised and discussed at academic staff meetings. Staff can also take advantage of University initiatives such as Senior Academic Promotions Open Fora and CV schemes. One of our two female members of tenured academic staff was promoted to Reader from Oct 2016 and the other was promoted to Professor several years ago. This is the optimal possible outcome for our female tenured academic staff. Because of the small number of female tenured staff, it is not possible to make any meaningful comparison to the promotion rates for our male tenured staff (which are above average for the University as a whole).

(iv) Department submissions to the Research Excellence Framework (REF)

For the REF in 2014 there were 31 total eligible researchers (3 females and 28 males) from the IoA. In the actual submission there were 28. Of these, 3 (10.7%) were female and 25 (89.3%) were male. There is no evidence here of any gender imbalance in the choice of who was submitted.

In the 2008 REF exercise there were inputs from 57 IoA researchers. Of these, 6 (10.5%) were female and 51 (89.5%) were male. Eligibility information is not available.

5.2. Career development: academic staff

(i) Training

A wide range of training is provided centrally by the University for all staff and for academics courses, which are delivered either online, face-to-face or a mixture of both, cover orientation, academic practice, leadership and management, policies procedures and legislation, presentation and communication and personal development. Information about courses is disseminated widely by email or in hard copy on a regular and frequent basis. On top of this there are training sessions arranged by and offered specifically in the department on topics of particular interest or relevance to local staff, for example a recent session on Unconscious Bias.

(ii) Appraisal/development review

We follow the University's Staff Review and Development (SRD) scheme for academic staff. All staff are offered an appraisal at least every two years and one per year is encouraged. The purpose of the appraisal is to enhance work effectiveness and facilitate career development. This is achieved by discussing ways in which work could be developed and ways in which any difficulties and obstacles to progress could be removed.

Most appraisals are carried out in April and May every year. An appraisal session involves the staff member being appraised by a carefully chosen, more senior person within the IoA. The appraisal consists of preparation (e.g. the appraiser reads a CV and/or the written record of a previous appraisal while the appraisee prepares answers to some standard questions), having a one-on-one discussion and finally jointly recording the outcome. The discussion is expected to take one hour.

The whole appraisal process is assessed every year at a Post Appraisal review meeting which includes many SAT members (including the SAT chair). No gender bias issues have been found.

AP9: *Bring appraisals earlier in postdoctoral contract (within first 6 months and annually thereafter).*

AP10: *Let tenured academic staff know that they have the option of having appraisals more often than biennially if they so wish.*

AP11: *Publicise appraisal training for reviewers and reviewees.*

AP12: *Director reviews and shares relevant appraisal data with Athena SWAN Chair.*

AP13: *Add item on work/life balance to appraisal checklist.*

(iii) Support given to academic staff for career progression

Appraisals are given yearly (see section 5.2 (ii)).

Outside the IoA the University provides excellent support for career development via courses and on-line training.

Often, non-tenured staff request senior staff participation in mock interviews and job talk rehearsals particularly when they are trying to get a permanent academic job. The participation by senior staff when asked is generally very high (although we do not have exact numbers). The high success rate of our leavers in getting permanent positions (see section 4.2 (iii)) is probably attributable (at least in part) to the support we give for career progression.

(iv) Support given to students (at any level) for academic career progression

Undergraduate students are supported in their courses by Course Coordinators (one female, one male) for the 3rd and 4th year groups respectively and also receive pastoral and academic support within their Colleges. The small sizes of our undergraduate cohorts makes it relatively easy for Course Coordinators to get to know their students. The (female) undergraduate teaching secretary is also closely involved in student support and liaises with the Course Coordinators in this role. Students are told that people (especially the course coordinators) are available for career planning advice if they want it. Students who leave at the end of the 3rd year are almost all moving out of academia and they receive support in the form of job references and general advice (usually from the course coordinator or one of the supervisors they get for their taught courses). Those who leave at the end of the 4th year often move on to a PhD course in Cambridge or elsewhere and are usually planning to have a sustainable academic career. They receive support in the form of job references and general advice from the course coordinator and/or their project supervisor.

Currently doctoral students are supported by a graduate coordinator, the graduate secretary (who is female) and a range of pastoral support within their Colleges. The SAT questionnaire suggested that female graduate students feel well supported. They also can benefit from Dignity@work contacts in the IoA, introduced as a University initiative with the aim of providing points of contact in the department for anyone that is experiencing bullying in the workplace; the IoA's Dignity@work contacts are both female, covering the academic and support staff sectors respectively and we ensure that these roles are well publicised (**AP17**).

AP17: *Publicise Dignity@Work contacts.*

In terms of mentoring and careers advice, female postgraduate students receive the same support as their male peers, i.e. through the provision of a set of seminars devoted to issues such as `Applying for jobs' and `Success in grant applications.' In addition, first year students must attend a series of workshops in which they practise their presentation skills. As a recent innovation, the department provides funding for PhD students to organise similar sessions for undergraduate students. In the future, female students will benefit from further

innovations in our action plan: i) the organisation of sessions (open to men and women at all research levels) devoted to the work-life balance (**AP53**) ii) the setting up of a group exploring diversity (**AP19**), aimed at any individuals who feel that their minority status – whether of gender, race or nationality - presents issues in their professional life (or, more broadly, to all those interested in ensuring a diverse and inclusive scientific community) . Depending on demand, this group may bring in external expertise to provide workshops on issues such as imposter syndrome.

AP53: *Organise work-life balance sessions for postgraduate students.*

AP19: *Set up a diversity forum and publicise it to all staff & students.*

(v) Support offered to those applying for research grant applications

Funding applications are almost all made by Fellows and tenured research staff. The IoA's senior financial officer gives advice on what funding schemes are available and the technicalities of how the required resources in the proposal translate into full economic costs. Grant applicants often ask their peers to read their proposals and provide feedback before they are submitted.

The University provides courses on how to be successful when writing grant proposals.

We do not currently have any specific support mechanisms for those who are unsuccessful with funding applications. This gap in our support procedures has created an action in our action plan (**AP47**).

AP47: *Consider what support can be given to those who make unsuccessful grant applications*

5.3. Flexible working and managing career breaks

(i) Cover and support for maternity and adoption leave: before leave

When it becomes known that a member of staff, academic or otherwise, intends to take maternity or adoption leave, the Department Administrator will meet with them as early as possible to discuss procedures, to clarify what needs to be done and when, and to ensure they are fully aware of the options around leave available to them. Weblinks to policies and contact details for HR support are provided, and permutations of leave are considered, as are details of Keeping in Touch days, information about how Maternity pay is paid, and what they need to know about returning. A Risk Assessment is carried out and any specific needs addressed as far as possible for the period before leave commences. Where appropriate cover will be arranged for the period of leave, and handover/shadowing will be arranged before leave begins.

(ii) Cover and support for maternity and adoption leave: during leave

Those who have taken maternity leave in the recent past have expressed appreciation at the support and information offered by the department, both in terms of the accessibility and helpfulness of the administrative team and the

attitudes encountered from line managers when negotiating a phased return to conventional office hours. Currently, the IoA follows University Policy in carrying out a formal Risk Assessment at the stage that notification of impending maternity leave is announced and mothers liaise closely with the Departmental Secretary and HR Administrator before, during and following maternity leave. Our Action Plan includes commitments to reviewing the information available.

AP16: *Review library holdings and web links relating to work/life balance issues in science*

AP15: *Review how the possibility of flexible working is publicised.*

AP22: *Review and revise available material for recruitment/induction*

AP23: *Gather information about local nursery provision/school catchment areas and make details easily accessible*

We have formalised existing processes and ensure that all returning carers are interviewed by the Departmental Administrator on their return to work (**AP27**).

AP27: *Interview all returning carers.*

Staff on maternity leave can take optional *keep in touch* (KIT) days where they come in to work during their maternity leave. These days are paid at the full rate and, as the name implies, help the person on leave to transition back into her job when she returns to work.

Normally temporary cover is only provided for support staff on maternity/adoption leave, not for academic/research staff. In the past 5 years (since 2012) we have had 3 cases of support staff on maternity leave. In one case the work which was not core to institutional activity and was flexible enough to be simply reduced from regular levels for the period of leave; in a second case a temporary member of administrative staff was employed to cover the period of leave; in the third case, a technical role, a temporary role was advertised as a secondment position and offered the opportunity for someone from a different institution in the University to gain experience of a new, wider range of technical skills.

Our Action Plan also includes a novel pilot scheme. The IoA will underwrite the additional expenses required in order that those taking maternity/parental leave can work for the full duration of their contracts.

AP26: *Introduce a pilot scheme where the IoA underwrites a contract extension for researchers who took maternity leave or shared parental leave.*

For example, if a person on a 36-month contract paid through a grant takes 3 months maternity leave the IoA will extend that person's original contract by 3 months to a total of 39 months using internal IoA funds.

(iii) Cover and support for maternity and adoption leave: returning to work

The IoA particularly welcomed the expansion of the University's Returning Carers' Scheme in 2013 which is available to all academic and research staff and which can be used for a wide range of support measures including covering indirect childcare expenses (for example, the travel and accommodation expenses of the person looking after an accompanying child while the researcher/academic attends a conference overseas). The importance of such

provision is underlined by the fact that a number of questionnaire respondents cited the practical problems of maintaining international visibility as a major difficulty during their children's infancy. We will monitor the take up of this scheme and whether the support offered can meet demand.

AP33: *Publicise Returning Carers' Scheme*

AP34: *Identify mentors for those wishing to apply to Returning Carers Scheme*

AP35: *Review further cost-effective measures and funding sources to facilitate academic travel for carers (e.g. to pay for childcare).*

(iv) Maternity return rate

Figure 5.4: *The number of individuals taking maternity leave in the last 7 years.*

Maternity return rate is 100% (out of 10 individuals who have taken maternity leave in the last 7 years).

(v) Paternity, shared parental, adoption, and parental leave uptake

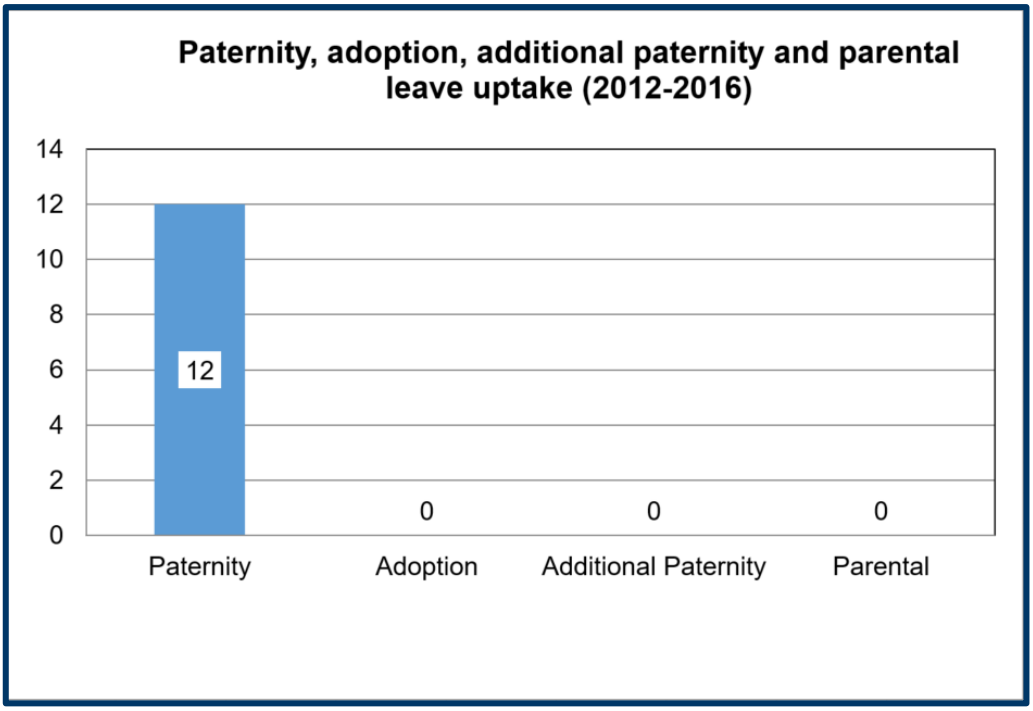


Figure 5.5: Breakdown of non-maternity leave taken over a five-year period by category.

We do not have the information on the number of new fathers within the IoA to know the fraction of those that formally take up paternity leave but we suspect that it is only the minority that do so. Twelve individuals have taken paternity leave in the last 5 years. Two people have recently taken shared parental leave (after Oct 2016 so they do not appear in figure 5.5). Our Action Plan includes actions to collate information on new fathers, to promote the uptake of paternity leave and to publicise shared parental leave opportunities.

AP31: Request notification of paternity

AP30: Publicise paternity leave regularly by newsletter

AP32: Publicise shared parental leave policy by newsletter, email circulation, HR presentation and in induction pack

(vi) Flexible working

Our questionnaire respondents expressed satisfaction at the attitude of line managers to those requesting flexible working arrangements (e.g. purchase of additional equipment to allow mothers to work flexibly at home). We are reviewing how the possibility of flexible working is publicised (**AP15**) to ensure that `best practice' is universally followed by all line managers.

AP15: *Review how the possibility of flexible working is publicised.*

A start in this direction is the requirement that line managers take the University's Equality and Diversity training module which explores issues such as indirect discrimination in the workplace (**AP24**).

AP24: *Require recruiters and line managers to take University E&D training*

(vii) Transition from part-time back to full-time work after career breaks

Towards the end of a career break the Department Administrator discusses with the person on leave the arrangements for their return. In the case of academic and research staff they have usually already discussed these with their line manager. At this stage if they wish to return initially to part-time working, a timetable will be agreed outlining the days they will work and the length of time until they expect to return to full-time working. A graduated return may be instituted but again the timetable would be worked out. The plans are reviewed either by the line manager or the Department Administrator at regular intervals, dependent on the duration of the period of part-time work, to ensure they remains realistic and to ensure the workload is manageable. If any additional cover is needed during this period it would be discussed and agreed before the return from leave; liaison would be expected between both people covering the work.

5.4. Organisation and culture

(i) Culture

The culture of the IoA prizes scientific excellence and it is a deeply held belief that this is best achieved in a working environment which is relaxed and collegial. Researchers joining the IoA from other prestigious institutions often remark on the notably friendly, interactive and non-hierarchical atmosphere of the IoA. This view is often expressed during appraisals and is consistent with the good ratings that the IoA's working environment achieves.

Figure 5.6: *National recognition. Left: Two former Gresham Professors of Astronomy from the IoA, Public Astronomer Carolin Crawford and Astronomer Royal Martin Rees. Centre: Researcher Farzana Meru, short-listed for the UK Women of the Future Award 2015. Right: Professor Cathie Clarke, awarded the Royal Astronomical Society's Eddington Medal, 2017.*

An important ingredient of IoA culture is the wealth of opportunities for researchers to present their work to each other. Women participate fully in

delivering talks and seminars and this helps to ensure that they are visibly in the scientific mainstream. Care is also taken to achieve gender balance in the external speakers invited to deliver the weekly Colloquia and in the choice of speakers for the two prize lectures per year. The high quality lectures delivered in this series by eminent female scientists, and the fact that the graduate students meet with the speaker in closed session before the lectures, provide very positive role models.

We are also keen to share good practice on support for women in Astronomy with other institutions.

AP37: *Initiate and maintain contacts with other major astronomical centres.*

Our survey (see section 6) has confirmed that most people (men and women equally) view the IoA as a welcoming, inclusive and female-friendly place. The survey explicitly enquired whether people felt that the IoA was a working environment in which they felt comfortable and respected and this question elicited almost universal assent. Some representative quotes include:

`The IoA has a really excellent working environment. I've never felt I've been disrespected by anybody at the IoA because I'm a woman' (MPhil/PhD student)

`I very much enjoy working at the IoA. There is a good sense of camaraderie between the postdocs. I believe I am treated respectfully by senior staff. From all staff the goal seems to be to provide a positive environment for carrying out world class research.' (Postdoc).

Over the years, undergraduate women have also expressed great appreciation of the IoA's welcoming atmosphere and have praised the more personal approach to student-staff relations which is possible within the relatively small cohort of astrophysics students. Some undergraduate student quotes include:

`I have really enjoyed the course content and also the atmosphere of the department: the friendliness and relaxed atmosphere made it even more enjoyable'

`Department is great. Very welcoming. The staff are all very approachable and keen to help if they can.'

We also pride ourselves in being receptive to student feedback; indeed, in a recent National Student Survey, our third year course received the highest satisfaction rating in the University for the statement "It is clear to me how students' comments on the course have been acted upon.". Also, last year the IoA was one of the few departments in the University to score 100% overall course satisfaction rating in the National Student Survey.

We have recently set up and resourced peer led sessions in which PhD students mentor undergraduate students in scientific communication skills in order to allow undergraduate students to experience something of the world of astronomical research from those who are slightly more advanced along their career paths. The IoA is well known for its lively interactions in the informal social setting of daily tea and coffee sessions, along with the weekly departmental Bread and Cheese lunch. There is a wide range of additional social events with specific purposes (e.g. the wine and cheese party to introduce new postdocs to the department, the curry house visit to introduce new graduate students, the peer led lunch party in which students and postdocs involved in departmental

teaching can reflect on their experience and share good practice). Crucially, women participate widely in all these activities.

(ii) HR policies

The effectiveness of HR policies for equality, dignity at work, bullying, harassment, grievance and disciplinary processes are monitored through our annual anonymous surveys which have specific questions on these issues. For the question "In the last 12 months have you experienced bullying or harassment of any kind in the workplace?" 6 out of 105 respondents answered yes. Of these, 2 out of 32 were women and 3 out of 50 were men. This is below average for such a survey (e.g. see section 6) and there is no evidence that there is any gender bias. A SAT sub-group was set up to consider what the IoA should do in the event of an actual report of bullying or harassment.

AP54: *Set up a SAT sub-group to consider what the IoA should do in the event of an actual report of bullying or harassment.*

Table 5.1: *Committee representation. The top 7 of the 18 listed are the most influential.*

Committee	Tenured academics			Non-tenured academics			Support staff		
	#M	#F	%F	#M	#F	%F	#M	#F	%F
Academic Staff	15	2	12%	0	0	-	1	2	67%
Senior Management	2	1	33%	0	0	-	1	2	67%
Athena SWAN SAT	7	2	22%	4	7	64%	0	2	100%
Finance	2	1	33%	1	2	67%	0	0	-
Teaching	8	1	11%	0	0	-	0	2	100%
Graduate Students	3	1	25%	0	0	-	0	0	-
Project Oversight	6	0	0%	2	0	0%	0	0	-
Buildings & Grounds	4	0	0%	0	0	-	1	1	50%
Consolidated Grant	3	0	0%	0	0	-	0	0	-
Sackler Visitors	4	0	0%	0	0	-	0	1	100%
Fellowship Selection	3	0	0%	0	0	-	0	0	-
Colloquia Organisation	2	0	0%	0	0	-	0	0	-
Library	2	0	0%	0	0	-	1	0	0%
Outreach	1	0	0%	0	2	100%	0	1	100%
Computing Oversight	3	0	0%	1	0	0%	0	0	-
High Power Comp.	2	1	33%	1	1	50%	0	0	-
Computer User Group	5	0	0%	3	0	0%	1	1	50%
Website Group	2	0	0%	1	0	0%	0	3	100%

(iii) Representation of men and women on committees

Our most senior women tend to have more committee work than men, including the most influential committees (top 7 rows of table 5.1). For example, the average number of influential committees per male tenured member of staff is 2.3 while it is 4.5 for the 2 tenured female staff members. Given this situation, it is obviously not possible to ensure female representation on all committees all the time. This is a snapshot of a situation where individuals are rotated on and off committees; there are no committees which are without female representation in the long term. Formally, committee members are appointed

by the Director following discussion with relevant parties and adequate female representation is an important consideration.

(iv) Participation on influential external committees

Tenured academic staff are regularly encouraged by the Director at academic staff meetings to put their names forward for external committees. Also, the people who organise committees often come directly to IoA staff to ask them to be members (e.g. STFC). Professor Cathie Clarke was until recently on the STFC Astronomy Grants Panel. She was also recently awarded the 2017 Royal Astronomical Society Eddington Medal. Dr Debora Sijacki is Chair of the DiRAC (national HPC facility) Project Boars.

(v) Workload model

For tenured academic staff the IoA has a workload indicator where nominal *hours* are ascribed to a range of duties including administration, pastoral support, teaching. This allocation is agreed by the academic staff committee and reviewed annually; the work load indicator is then used by the Director to assign tasks. The Director is also responsible for ensuring an equitable rotation of different categories of duties. Tenured academic staff are frequently reminded of the broad range of duties that counts towards promotion assessments.

There is no formal workload model for non-tenured academic researchers. We have therefore created an action in our action plan to address this issue.

AP48: *Develop a formal workload model for academic researchers on fixed-term contracts.*

(vi) Timing of departmental meetings and social gatherings

Meetings involving relatively small numbers of individuals are generally arranged on a case by case basis by doodle poll; these do not adhere to a "core hours" concept because their timing reflects the schedules of the individuals concerned. The academic staff committee is held at 2.30 pm which is the earliest time in the day that does not clash with teaching and seminars. Nevertheless, this scheduling does mean that parents of young families do on occasion have to leave the meetings before they are concluded. Executive decisions are not made after this point and the Chair seeks input to relevant discussions from relevant individuals as appropriate.

A more problematical issue is that of seminars, whose number has increased greatly in recent years as many research groups hold their own seminars and group meetings. A minority of such meetings are scheduled late in the afternoon (4.30 pm) because of the impossibility of not otherwise clashing with other relevant activities; this does inevitably limit participation of those with young families. We have an action item in our action plan (**AP44**) to address this issue.

AP44: *Write to all seminar organisers to be mindful of the needs of careers when deciding the event's timing*.

The most contentious issue is the timing of the weekly departmental Thursday Colloquium which was traditionally held at 4.30 for many years and is followed

by a social gathering. This timing has been frequently discussed over the years by the academic staff committee but, as part of the Athena SWAN self-assessment process, it was recently recognised that this decision should take into account the large number of non-tenured researchers who are most likely to be affected by childcare issues. A questionnaire sent to all scientists in the department in 2015 revealed a large range of views with no time being feasible for everybody. However, a large number of respondents stated that bringing the Colloquium forward from 4.30 to 4.00 would significantly facilitate their attendance. This new time was introduced experimentally from October 2015 and the resulting attendance levels (and gender profile of the attendees) monitored. Following our action plan

AP14: *Monitor attendance of Colloquium by gender (time changed in response to staff consultation)*

our most recent survey specifically asked "Has this re-timing enabled you to attend more frequently?" and 13.4% of respondents answered yes. We have therefore decided to keep the Colloquium start at 4.00pm.

The other significant social gatherings at the IoA are morning coffee (11 am), afternoon tea (3.30 pm) and a Weekly Bread & Cheese lunch preceding Wed departmental seminars.

(vii) Visibility of role models

There are many events, seminars, talks etc. at the IoA and these are organised by people across the whole spectrum of career stages. Typically, we have 4 or 5 IoA talks per week and 3 or 4 multi-day conferences/workshops per year.

Figure 5.7: Dr *Farzana Meru giving a seminar, April 2017.*

Our large SAT is especially useful when it comes to ensuring that event organisers are mindful of the representation of women. Many of the events are organised by SAT members. When an event organiser is not a SAT member they

are very likely to work with a SAT member who will ensure that gender representation is not overlooked. We also have a formal action in this regard in our action plan.

AP45: *Regularly write to all seminar organisers to be mindful of gender balance when selecting speakers.*

For our Thursday colloquium (our flagship speaker event) in the year from April 2016 to March 2017, 8 (31%) out of 26 of the talks were given by female speakers including the high profile Eddington Lecture. In the calendar year 2016, of the 66 Wed lunchtime talks given, 49 (74%) were given by males and 17 (26%) by females.

Our webpages and notice boards will soon highlight our outstanding female role models.

AP7: *Highlight senior female staff more clearly on IoA website*

AP8: *Highlight senior female staff on IoA photo-board and other prominent positions.*

(viii) Outreach activities

The Institute of Astronomy has a very active outreach programme, led by the (female) Public Astronomer - who is also a member of our SAT. Our aims are to promote the research carried out at IoA and to educate and inspire the next generation of young scientists, while communicating the excitement we feel about astronomy to the wider public in all their guises. We believe our major strength is that the science is being communicated by the scientific practitioners - those who are making the discoveries and are most passionate about their science. The outreach programme is also seen as a vehicle to provide students (both graduate and undergraduate) with the opportunity for training and practice in important presentation and communication skills.

The wide range of activities carried out include: visits to and from school classes from reception through to sixth-formers; a variety of talks to the general public, including a large number of astronomical societies; interviews on national and public radio; staffing stalls at schools careers fairs, hosting many evening visits from local community groups (brownies, cubs, WI, scouts etc); open events during the Cambridge Science Festival; and the highly popular weekly Public Open evenings throughout the winter which provide both short science talks and hands-on observing (if the weather is clear). Scientists at all stages of their career are encouraged to participate, and we depend particularly on help from early-career post-docs, postgraduate and undergraduate students. Over the last five years, the volunteers have been equally split between men and women while 30% of the talks at our open evenings and science festival events have been given by a female presenter. Over the last year we have had 11 postgrads and 9 undergrads who actively engaged in the outreach (public open evenings and community group visits). Of these 5 of the 11 of the postgrads are female, and 4 of the 9 of the undergrads are female. Students get paid a small gratuity (£20-25) for each evening they help.

In all cases, involvement in Outreach adds value to an individuals' *curriculum vit*ae (evidence of outreach activity is favoured in academic job competitions, in applications for research grant funding and in the promotions process).

In addition to these activities (which promote astronomy to various sectors of the public) we specifically promote the study of astrophysics at Cambridge by participation in the University's Annual Open Days. This takes the form of a talk by a postgraduate student who can describe at first-hand the path from undergraduate study to cutting edge research. We choose the most articulate and engaging speakers for this important role: to date, half of our speakers have been female (drawn from a graduate student population that is around 30% female).

Figure 5.8: *Outreach to all age groups is central to the IoA mission.*

Word count: 5898 words

6. FURTHER INFORMATION

Our on-line survey

One of our main actions this year was to conduct a survey of ***all*** members of the IoA (except for our undergraduates who have a separate survey which is still in progress). The surveys will be repeated yearly to monitor any changes and provide success measures for many of our actions. The whole SAT contributed to the design of the survey which involved a significant amount of work. Great care was taken to ensure anonymity.

There were 70 questions on work environment, interactions within the Institute, work-life balance, caring responsibilities, inclusion, fair treatment, and diversity and equality. The survey garnered a ~70% response rate. Our analysis included checking for differences by gender or by career stage/group. 23 questions were also used in the School of Physical Sciences (SPS) 2014 Staff Survey which we used as a benchmark (positive responses were 11% more common at the IoA).

Table 6.1: *Positive outcomes from the survey.*

Statement	% that either Agree or Strongly Agree
I am satisfied with my working environment	82%
I am treated with fairness and respect in the Institute	90%
I believe that the Institute values individual differences (e.g. cultures, backgrounds, working styles, ideas).	92%
I believe that working at the IoA makes me a stronger candidate for getting a job elsewhere in the future.	81%
I feel I have equal opportunity for development and career progression at the University regardless of my age, gender, cultural background, carer responsibilities, etc.	81%
I would recommend the Institute as a great place to work	82%
Staff are treated with respect regardless of their job	80% (90% among support staff)
If I have an issue with being treated fairly in the workplace, I am confident that the Institute will take appropriate action.	81%
How would you compare the working environment at IoA compared to other institutions you have experience with, in terms of inclusion, equality, and fair treatment?	26% - Significantly above average 40% - Above average <9% - Below average

There were no dramatic differences between male and female responses and 85% were aware of the IoA's E&D activities.

Table 6.2: *The 23 questions which we could benchmark against the SPS 2014 survey. The 2nd and 3rd columns are the percentage of respondents who agree with the statement (unless it is a yes/no question). The 4th column is column 2 minus column 3. In general, our responses are more positive than those in the SPS survey.*

Statement	IoA (%)	SPS (%)	Diff
If I have an issue with being treated fairly in the workplace, I am confident that the Institute will take appropriate action.	81	55	26
I feel I have equal opportunity for development and career progression at the University regardless of my age, gender, cultural background, carer responsibilities, etc.	81	58	23
I receive regular and constructive feedback on my performance.	53	30	23
I would feel able to report bullying or harassment without negative impact.	77	56	21
Staff are treated with respect regardless of their job.	80	64	16
I am satisfied with the recognition I receive from within the IoA.	65	49	16
I believe that the Institute values individual differences (e.g. cultures, backgrounds, working styles, ideas).	92	77	15
I would recommend the Institute as a great place to work.	82	69	13
I am comfortable with the amount of work I am expected to do.	78	65	13
I am satisfied with my working environment.	82	70	12
There are policies/practices in place to support me if I experience stress or pressure.	39	27	12
I believe that the University is an equal opportunity employer.	90	79	11
There is effective cooperation between people within my immediate work area.	85	75	10
My immediate supervisor treats me with respect.	89	80	9
I feel able to speak up and give my views on the way things are done.	76	68	8
I am treated with fairness and respect in the Institute.	90	82	8
Considering my duties and responsibilities, I think my pay is fair.	51	43	8
In last 12 months, have you experienced bullying or harassment of any kind in the workplace?	93 no	89 no	4
I think the Institute cares about my health and wellbeing.	53	50	3
I am satisfied with the policies/practices available at the University and/or my College to manage health and wellbeing.	53	50	3
I am able to strike the right balance between work and home life.	58	57	1
I have good relationships with the colleagues I work with.	93	94	-1
In my experience there is effective cooperation between the different parts of the Institute.	39	48	-9

Some questions indicate areas where we need to improve and we have generated action plan items.

- Only 56% are able to manage stress to avoid it impacting their work or wellbeing, and only 40% believe there are polices/practices in place to support them in dealing with it, with the worst responses among postdocs. In response, the Astro Postdoc Committee has scheduled a talk in May by a licensed Psychologist to discuss stress and anxiety and how to reduce them. There is also an action plan item.

  AP55: *Consider what can be done to help people avoid and/or manage stress.*

- Although 93% had not experienced any bullying/harassment in the last 12 months (above the SPS benchmark of 89%), we intend to look in to this as any amount of bullying or harassment is unacceptable. Furthermore, 23% of males and 33% of females would not feel able to report bullying or harassment without worrying about it having a negative impact on them (compared to the 44% from the SPS survey).

  AP54: *Set up a SAT sub-group to consider what the IoA should do in the event of an actual report of bullying or harassment.*

- Although 65% of individuals are satisfied with the recognition received within the IoA, ~16% are dissatisfied, suggesting more recognition within the Institute may be beneficial.

  AP7: *Highlight senior female staff more clearly on IoA website*

  AP8: *Highlight senior female staff on IoA photo-board and other prominent positions.*

  AP50: *Develop specific ideas to improve job satisfaction of non-academic staff.*

- Males (58%) are more likely than females (49%) to consider their pay to be fair. A sub-committee has been formed with the Astro Postdoc Committee to investigate possible gender bias in pay among postdocs who are least likely to consider their pay to be fair.

  AP41: *Investigate salary information for postdocs to check that there is no unfair gender bias (or any other unfair bias).*

Action plan items not mentioned in previous sections

We are keen to ensure that our work on inclusivity, equality and fairness includes our support staff. Two actions relating to support staff which did not fit under the section headings of the previous sections relate to the support staff. One aims to explore the satisfaction/dissatisfaction of support staff beyond what we could glean from our survey.

AP42: *Organise a focus group for support staff.*

The other aims to improve the gender balance of the administration support group.

AP49: *Work out how to encourage men to apply for administration support roles.*

Finally, through hearing about rare unfortunate experiences at other institutions we wish to clarify to visitors attending IoA hosted conferences what is regarded as acceptable/unacceptable behaviour.

AP43: *Introduce a code of conduct for conference attendees which is given to them as part of the conference information pack.*

Word count: 497 words

#	Action	Objective(s)	Responsibility	Timescale	Success Measures	Progress at 17th April 2017
1	Maintain membership of the SAT.	To ensure that the SAT represents all groups of staff and students whilst at the same time having an acceptable gender balance	Deputy Director and SAT Chair	From January 2016	All staff and students are represented on SAT and gender balance achieved.	SAT membership objectives achieved. Gender balance 11:11
2	Encourage SAT members to engage with University Athena SWAN Network events.	To ensure SAT members learn and share good practice	Deputy Director and SAT Chair	From January 2016	For 90% of Network events there should be at least one IoA SAT member in attendance.	Event attendance achieved.
3	Hold frequent SAT meetings.	Embed Athena SWAN practices in IOA culture, to monitor data, to monitor action plan, to make and review progress.	SAT Chair	From March 2016	Progress against action plan monitored and discussed as a standing item at Academic Staff Committee and Senior Management meetings. Regular reports to School E&D Forum and University E&D Committee. Good survey feedback.	Achieved. Meeting frequency stepped up to once every 6 weeks after learning that our first bronze application was unsuccessful to help prepare new bronze application.
4	Issue annual questionnaires to all individuals at the IoA (staff and students).	To assess success and impact of measures introduced and identify new issues which need to be addressed through the action plan.	Athena SWAN SAT questionnaire sub-committee	Began early 2016. Repeat annually around May.	High completion rates (> 60%) across all staff and student groups. Results analysed and shared across the Department. Successes celebrated and further areas for improvement identified.	Sub-committee formed. Questionnaires created (one for undergrads and one for everyone else). Non-undergrad survey compleion rate was 69.5%. Undergrad survey still in progress.
5	Run open workshop with role models (monitoring attendance by gender)	Create interactive discussions on a range of topics e.g. work/life balance	The SAT	Dec 2017. Repeat annually	> 50% of postdocs and PhD students participating within 2 years; feedback recorded for each event	Not started.
6	Host HR-led presentations/workshops on shared parental leave and other policy developments	Inform IoA members of HR policies.	School HR team	May 2016. Repeat as necessary	> 50% of postdocs and PhD students participating within 2 years; feedback recorded for each event. Awareness checked via annual survey.	First presentation took place April 2016. Attendance was high.
7	Highlight senior female staff more clearly on IoA website	Increase the visibility of senior roles played by women in IoA.	SAT website sub-committee	By Feb 2017	Annual questionnaire feedback should indicate high awareness and visibility of senior women (>70%)	SAT webpages sub-committee formed. Webpages almost done.
8	Highlight senior female staff on IoA photo-board and other prominent positions.	Increase the visibility of senior roles played by women in IoA.	Dept Administrator	By Dec 2017	Annual survey feedback should indicate high awareness and visibility of senior women (>70%)	Not started yet.

#	Action	Objective(s)	Responsibility	Timescale	Success Measures	Progress at 17th April 2017
9	Bring appraisals earlier in postdoctoral contract (within first 6 months and annually thereafter).	To ensure that the apppraisal process achieves its purpose because: A) if the first appraisal is too late there is a danger that the end of the appraisee's contract will be too soon for agreed actions to take place). B) Increases the chance of the appraisee having a second appraisal.	Dept Administrator	Began January 2016	Target 80% appraisals under new scheme in academic year 2015-16; 100% by academic year 2016-17	In operation - started in 2016. Targets being met.
10	Let tenured academic staff know that they have the option of having appraisals more often than biennially if they so wish.	To maximise the effectiveness of appraisals for tenured academic staff.	Dept Administrator	Began January 2016	50% uptake under new scheme 2017-18; annual survey should indicate less than 15% dissatisfaction with frequency of appraisals.	In operation - started in 2016.
11	Publicise appraisal training for reviewers and reviewees.	Engage with School wide review of appraisals.	School HR team & Dept Administrator	Began academic year 2016/17	Information is provided and School-wide appraisal process are updated. Training is actively promoted via email and at induction. Satisfaction with appraisal process is increased (as monitored by survey).	In operation. In 2016 satisfaction was 56% at School level and 61% for IoA.
12	Director reviews and shares relevant appraisal data with Athena SWAN Chair.	Use appraisals for effective information gathering regarding Athena SWAN issues	Athena Chair & IOA Director	Review in May annually from 2016	Good feedback on appraisal process via the annual survey.	First review done.
13	Add item on work/life balance to appraisal checklist.	Create opportunity to discuss workload and work-life balance issues in all appraisals	Dept Administrator	Began January 2016		Done
14	Monitor attendance of Colloquium by gender (time changed in response to staff consultation)	Optimise Colloquium timing to ensure inclusivity including those with caring responsibilities	Athena SWAN SAT	From Jan 2016	Attendance records and annual questionaire must indicate that the re-timed Colloquium has enabled better attendance including by those with caring responsibilities.	13.4% of respondents to questionnaire said that retiming the colloquium start from 4:30 to 4:00 had enabled them to attend more frequently. The attendance of females varies between 20-25%.

#	Action	Objective(s)	Responsibility	Timescale	Success Measures	Progress at 17th April 2017
15	Review how the possibility of flexible working is publicised.	To ensure that `best practice' on flexible working is universally followed by all line managers.	SAT	By Oct 2018	Creation of a set of guidelines.	Not started yet.
16	Review library holdings and web links relating to work/life balance issues in science	Improve information available on work/life balance issues in science	IoA librarian	By Oct 2018	Questionnaire feedback should indicate increased awareness of issues compared to previous questionnaire feedback.	Not started yet.
17	Publicise Dignity@Work contacts.	Improve information available regarding pastoral support	Dept Administrator	From May 2016	Annual questionnaire feedback should indicate at least 60% awareness of sources of help if required	69% of questionnaire respondents were aware of our dignity@work contact before taking the questionnaire. The survey will have increased the awareness further (i.e. all respondents were aware after completing the survey).
18	Send welcome letter sent to all incoming researchers/students.	Improve support for new arrivals	Deputy Director	From Oct 2016	Feedback via appraisal system and annual questionnaire should indicate that researchers/students are happy with the support they get when they first arrive.	In operation since Oct 2016
19	Set up a diversity forum and publicise it to all staff & students	Check for any diversity issues	SAT member (IoA Public Astronomer)	By Dec 2017	Meeting frequency should be at least twice per year.	
20	Review advertising process for new vacancies including gender neutral criteria and wording of adverts.	Ensure recruitment process is attractive for women.	Tenured staff SAT members + HR Administrator.	From October 2016 onwards	Fraction of female applicants for tenured academic jobs should be 25% or more (increased from current 16-19%)	Two positions have been advertised. The female application fractions were 31% and 18% for the exoplanetary and astrostats lectureships respectively.
21	Create and operate an Astro-Postdoc committee	Improve the representation of the researcher community	SAT researcher representative(s)	Academic year 2016-2017	Reseacher issues discussed and actions developed and adopted	Astro-Postdoc committee created in 2016
22	Review and revise available material for recruitment/induction	Publicise family friendly information to potential and new staff	Staff representatives on the SAT + Dept Administrator + HR Administrator	By October 2016	Annual questionnaire feedback indicates sufficient awareness (>50%) of family friendly processes.	Material updated summer 2016. 62% of questionnaire respondents were aware of the new arrangements for shared parental leave.
23	Gather information about local nursery provision/school catchment areas and make details easily accessible	Publicise family friendly information to potential and new staff	Staff representatives on the SAT + Dept Administrator	By Dec 2018	Existence of a document with the collected information. Usefulness of this shared information assessed via the annual questionnaire.	Not started yet.

#	Action	Objective(s)	Responsibility	Timescale	Success Measures	Progress at 17th April 2017
24	Require recruiters and line managers to take University E&D training	Ensure appropriate training for recruitment panels.	IOA directorate	By December 2017	Target 90% compliance by Sept 2017; 100% compliance by Dec 2017.	School confirmed June 2016 that all staff are expected to complete online E&D training.
25	Require recruiters and line managers to take Unconscious Bias awareness training	Ensure appropriate training for recruitment panels	IOA directorate	By Dec 2017	100% Compliance within 2 years of training availability	Special unconscious bias training session was provided for the IoA in June 2016 and was attended by 55 people. Recording to be made available.
26	Introduce a pilot scheme where the IoA underwrites a contract extension for researchers who took maternity leave or shared parental leave.	Provide additional support for carers on fixed term contracts	IOA Directorate + Finance Officer	Introduced from 2016	Resources secured. Feedback/impact sought from beneficiaries; adoption of scheme in other institutions	Started
27	Interview all returning carers	Improve information sharing for returning carers	Dept Administrator	From June 2016	100% returning carers interviewed by end of 2016. Any additional issues identified addressed by new actions.	Started and in progress.
28	Identify existing returned carers willing to provide information and support to new returners and facilitate liaison between them	Improve information sharing for returning carers	Dept Administrator	By Mar 2018	Staff willing to act as maternity/returning carer contacts identified.	In progress.
29	Provide information on KIT days/ graduated return options/Returning Carers' Scheme etc	Improve information sharing for those taking care leave	Dept Administrator	Academic year 2015-16	Aim is that 100% of eligible staff are aware of options and support available	In progress.
30	Publicise paternity leave regularly by newsletter	Encourage paternity leave uptake	Dept Administrator	Academic year 2015-16	Increased uptake of paternity leave: Should have at least 75% of new fathers using paternity leave instead of vacation time by 2017	Increase in number of requests made about leave by prospective fathers
31	Request notification of paternity	gather data regarding paternity leave uptake	Dept Administrator	Academic year 2017/18	Accurate data on paternity leave uptake rate available	Not started yet.
32	Publicise shared parental leave policy by newsletter, email circulation, HR presentation and in induction pack	Raise awareness of enhanced shared parental leave policy	Dept Administrator	From Mar 2016	Awareness of shared parental leave policy measured via annual questionaire (target > 70% by 2017).	Presentation took place in IoA April 2016. Already had some uptake. Survey indicates 62% awareness.

#	Action	Objective(s)	Responsibility	Timescale	Success Measures	Progress at 17th April 2017
33	Publicise Returning Carers' Scheme	Facilitate international academic travel for carers and support career development following a period of care leave	IOA Director & Dept Administrator	Scheme invites applications biannually	Applications to Returning Carers scheme by all eligible staff supported by Director by 2017	Survey indicates 58% awareness amongst IoA members.
34	Identify mentors for those wishing to apply to Returning Carers Scheme	Facilitate international academic travel for carers and support career development following a period of care leave	Deputy Director	From 2016	Current high level of successful applications is consistently maintained in the future	Potential Mentors identified.
35	Review further cost-effective measures and funding sources to facilitate academic travel for carers (e.g. to pay for childcare).	Provide further support schemes to assist mobility and career development of carers.	Athena SWAN SAT and IOA directorate	Academic year 2017/18	Funds should be identified and new schemes introduced by 2018	Not started yet
36	Investigate University and other funding options regarding hiring those in dual career academic relationships	Explore options for providing bridging resources to those coming to IOA through spouse obtaining a permanent position	IOA Directorate, School Physical Sciences	Academic year 2017-2018	Progress in developing a long tem strategy to address issue. Options piloted in the IOA	Not started yet
37	Initiate and maintain contacts with other major astronomical centres.	Share good practice on support for women in Astronomy	Athena SWAN SAT + IOA Directorate	March 2016 and actively from academic year 2017-2018	Establish a two-way flow of ideas regarding improving support measures and addressing the loss of women in the global astronomy career pipeline.	Professor Meg Urry, current President of the American Astronomical Society and champion of women in astronomy visited Cambridge and IOA in March 2016. SAT member registered for "Women in astronomy 4" conference in Texas in June 2017.
38	Write to appointment committee chairs to be mindful of unconscious bias.	Maximise representation of women on shortlists for tenured posts	IoA Director	From Nov 2016 onwards	At least one female candidate on all shortlists.	Since action started there have been two recruitments: one shortlist had 3 out of 5 females and the other had one out of 6.
39	Write to appointment committee chairs to be mindful of unconscious bias and to request that female candidates are appropriately represented on the short-list.	Maximise representation of women on shortlists for tenured posts	IoA Director	From Nov 2016 onwards	At least one SAT member on a committee	Since action started there have been two recruitments: one committee had 3 IoA SAT members the other had one.

#	Action	Objective(s)	Responsibility	Timescale	Success Measures	Progress at 17th April 2017
40	Compile information pack and give it to people before they arrive.	Improve information given to new starters	Dept Administrator	From Aug 2017	Conformation that people are receiving the info pack. Confirmation that is has value through appraisals and the annual questionnaire.	In preparation
41	Investigate salary information for postdocs to check that there is no unfair gender bias (or any other unfair bias)	Eliminate any gender bias (if any) for postdocs	IoA postdoc committee	From Jan 2017	Collection of data is achieved.	In progress
42	Organise a focus group for support staff	Explore the satisfaction/dissatisfaction of support staff	SAT Chair	Before April 2018	Event should happen and it should inform future actions.	Not started yet.
43	Introduce a code of conduct for conference attendees which is given to them as part of the conference information pack.	Clarify to visitors attending IoA hosted conferences what is regarded as acceptable/unacceptable behaviour.	Academic staff committee	By Dec 2017	Creation of document. No evidence of unacceptable behaviour.	Draft written.
44	Write to all seminar organisers to be mindful of the needs of carers when deciding the event's timing.	Help carers to be able to attend all seminars.	SAT chair	Start Aug 2017	All events scheduled in core hours	Not started yet.
45	Regularly write to all seminar organisers to be mindful of gender balance when selecting speakers.	Promote the visibility of female scientists	SAT Chair	Start Aug 2017	Number of female speakers should be in the range 25-40%	Not started yet.
46	Encourage senior staff to invite suitable female applicants to apply for advertised research positions	To maximise the number of female job applicants for research posts	IoA Director	From Sept 2016	Female job application rate > 20%	Done for last 2 tenured posts. The female application fractions were 31% and 18% for the exoplanetary and astrostats lectureships respectively.
47	Consider what support can be given to those who make unsuccessful grant applications	Improve grant application success rate. Improve moral within the IoA.	SAT and academic staff	By Dec 2019	Measure success via questions in annual surveys.	Not started yet.
48	Develop a formal workload model for academic researchers on fixed-term contracts.	Give credit to fixed-term contract research staff for non-research work done.	SAT and academic staff	From Oct 2017		Not started yet.
49	Work out how to encourage men to apply for administration support roles	To improve the gender balance of this group and to counter unconcious bias associating women and lower-paid, less prestigious work.	SAT and academic staff	By April 2018	The creation of a specific plan	Not started yet.

#	Action	Objective(s)	Responsibility	Timescale	Success Measures	Progress at 17th April 2017
50	Develop specific ideas to improve job satisfaction of non-academic staff.	To improve relations between the academics and the non-academics (including support staff) some of whom currently feel undervalued.	SAT and academic staff	By April 2018	The creation of a specific plan	Not started yet.
51	Encourage incoming female researchers to meet with at least one of the female tenured academic staff.	To provide a female perspective for incoming female researchers.	Dept Administrator	From Sept 2017	Measure uptake. Survey responses.	Not started yet.
52	Director introduces deputies (including female deputy director) to all staff & student cohorts at introductory talks at the start of the academic year.	Increase the visibility of senior roles played by women in IOA (2015 survey suggested some staff and students unaware of women playing senior roles in the Institute)	IoA Director	Start 2016	Annual questionnaire feedback should indicate high awareness and visibility of senior women (>70%)	Success measure achieved Oct 2016
53	Organise work-life balance sessions for postgraduate students.	To help postgraduate students to manage combining their work with their personal lives.	The SAT	By Dec 2018	Completion of sessions. Attendance >70% of postgrad students. Good feedback from survey.	Not started yet.
54	Set up a SAT sub-group to consider what the IoA should do in the event of an actual report of bullying or harassment.	Help anyone who feels they have been harrassed or bullied. Prevent further instances of bullying.	The SAT	By April 2018	Create a document explaining what people should do and what the process is. Confirm that people who need to act are aware of their responsibilities. Conform that the procedure is fully-compliant with general University procedure.	Set up and considerations are in progress.
55	Consider what can be done to help people avoid and/or manage stress.	Reduce work related stress.	The SAT	By Sept 2018	Improved feedback in annual survey.	External expert speaker scheduled to give a talk in May 2017. Further consideration to follow.
56	Form a continuously active search committee to identify and engage with strong scientists who might consider moving to a tenured position at the IoA.	Ensure that we are not overlooking or discouraging strong female candidates in our recruitment exercises for future tenured positions.	Director and academic staff committee	By April 2018	Success measured through application, short-listing and appointment statistics.	Not started.