

Impact template (REF3a)

<p>Institution: University of Portsmouth</p>
<p>Unit of Assessment: 9 Physics</p>
<p>a. Context</p> <p>The Institute of Cosmology and Gravitation (ICG) is a research institute addressing fundamental questions in cosmology and astrophysics. Over the REF2014 period, our impact agenda has primarily focused on <i>impacts on society, culture and creativity</i>. Beneficiaries include</p> <ul style="list-style-type: none"> • <i>schools</i> (enhancing science education, stimulating interest and engagement with physics); • <i>the local community</i>, including work with science centres and tourist attractions at public events (raising public awareness and understanding of science, changing attitudes to astrophysics); • <i>online communities</i> (“citizen scientists”) across the world (engaging the public in astronomy research, informing public discourse, and facilitating novel approaches to public engagement). <p>These engagement activities cover a wide range of demographics and are evaluated through quantitative feedback evidence.</p>
<p>b. Approach to impact</p> <p>Our impact strategy has evolved significantly during the REF period, from a small number of ad-hoc informal outreach talks, to now providing a coordinated and professional engagement agenda embracing all ICG researchers. We have developed a coherent strategy based on the following principles:</p> <ol style="list-style-type: none"> engagement with internal and external stakeholders to share resources and good practice thus generating a high impact, sustainable, outreach programme; encouragement of researchers (including PhD students) to undertake public engagement by providing support and rewards for such enterprise; promoting evidence-based evaluation of such activities. <p>Engagement: A majority of our impact comes from a range of public engagement activities, including numerous UK public talks by experts in cosmology and astrophysics, and increasingly the use of online facilities (e.g. see ICS “<i>UOP09GALAXY</i>”) that reach international audiences. We have engaged with local stakeholders including the University’s Department of Educational Liaison and Outreach, and Marketing and Public Relations, to ensure our activities are aligned with university priorities, exploiting central resources and publicity networks. We have also exploited our involvement in large, international research projects, often taking leadership roles to help promote national, and international, public engagement and leverage extra resources and expertise beyond those available locally, e.g. Nichol was Spokesperson for the Sloan Digital Sky Survey (SDSS; 2009-11) and was Communications Lead for the ESA Euclid mission (2011-13), while Masters was the LOFAR-UK Spokesperson from 2009-13 and is Outreach Coordinator for SDSS-IV.</p> <p>The University is now a member of the South East Physics Network (www.sepnet.ac.uk). SEPnet coordinates a regional outreach programme, delivered by professional outreach officers led by a central outreach director. In 2012 ICG appointed a full-time Outreach Officer (Gupta) who has helped develop and deliver an array of collaborative public engagement activities (e.g., Lego Universe), which are then exported to all SEPnet partners to achieve greater impact across the region, e.g., since 2011, SEPnet as a whole has delivered over 1000 outreach activities reaching 109,000 people (35k members of public and 33k children in Key Stage 3 to 5). SEPnet also supports the development and dissemination of good practice, including the assessment of impact, amongst outreach officers and staff, under the guidance of the central SEPnet outreach director who reports on such impact regularly to SEPnet Heads of Department. Therefore, public engagement is now embedded in all ICG activities with the support of SEPnet and local outreach</p>

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staff.

Our engagement activities also enhance local tourism through supporting events at the Intech Science Centre, Winchester, the local Gunwharf Quays shopping centre, contributions to the Portsmouth Festivities (e.g., "Space City" 2011) and our *StargazingLive* events at the Spinnaker Tower and HMS Warrior (see ICS "UOP09HIGHIMPACT"). All these commercial enterprises have confirmed the importance of our involvement in advertising their events and seek our future involvement, e.g., the BBC and Portsmouth Historic Dockyard wish to host another large *StargazingLive* event in 2014.

Our research has a broader impact informing policy and influencing public expenditure in the UK and European space industries (via ESA), and ICG staff use their expert knowledge and judgement on many funding agency panels and committees (see ICS "UOP09EUCLID").

Encouragement: The ICG supports all researchers to consider the impact of their work. This is achieved through a number of incentives, including: *i) Providing time* to explore potential impact e.g., Nichol was given teaching relief to undertake his role as Euclid Communications Lead (2011-13); *ii) Training* for both public engagement activities and commercial development of research, e.g. several ICG members (Bacon, Masters, Maraston) have attended media training courses given by the University in conjunction with BBC journalists. SEPnet staff also provide training for ICG staff and students leading to highly qualified outreach providers; Galliano (ex-ICG PhD student) is now the Outreach Officer for the Institute of Physics (from May 2013); *iii) Rewarding* researchers involved in outreach activity, e.g., the annual *ICG/SEPnet Postgraduate Student Outreach Award* and, in 2011, Masters received a University Recognition Award for her continued outreach leadership; *iv) Recognition* of the importance of impact as part of professional career development, e.g., Masters is the ICG Outreach Coordinator, and reports to the ICG Management Committee on the reach and effectiveness of our public engagement activities. We encourage all staff to seek external funding for outreach activities and recent successes include Ogden Trust funding for 50% of an Outreach Officer salary for 3 years (2013-16).

Evaluation: Over the past two years, in collaboration with SEPnet, we have initiated a more robust programme of self-assessment for all ICG outreach activity. First, we now record detailed demographic information for audiences attending ICG popular talks and events e.g., in academic year 2011/12, ICG researchers interacted with 6424 members of the general public, of which 553 were teachers and 831 were Key Stage 4 students (14-16yrs). Secondly, we request feedback at many events, either through specially designed ICG forms, or forms provided via stakeholders (e.g. other university departments), or fun exercises for younger kids such as placing "smiley faces" on posters. For example, 75% of school teachers believed our 2012 Cosmology Masterclass (see ICS "UOP09HIGHIMPACT") increased their students engagement in the subject, while 60% of students said it had increased their interest in university. Such feedback is also valuable for improving our public events, e.g., we received an average score of only 3.2 (from 5) for suitability of material presented at the 2012 Masterclass and, as a result, have improved the content for this year. Finally, we have begun to utilize online tools to solicit feedback, e.g., the use of twitter, by providing a hash-tag at the start of public lectures, thus encouraging the audience to tweet comments and questions that are addressed later. We also collaborate with SDSS researchers in designing online questionnaires to understand the motivations and demographics of our Galaxy Zoo users (see "UOP09GALAXY").

c. Strategy and plans

Our future strategy is to enhance the reach and results of our public engagement activities and to explore the wider public and commercial impact of our research. To do this we will develop an environment where impact-related activities are properly recognised, resourced and rewarded. Future plans include:

i) Continue our high impact public engagement events (see “*UOP09HIGHIMPACT*”), but extend their reach, especially our Cosmology Masterclass, by working with the University’s Educational Liaison and Outreach office, Ogden Schools Partnership and SEPnet2 to widen the participation of schools involved in this event; the Solent region has some of the lowest university participation rates in the country (from the HEFCE POLAR data).

ii) Deeper involvement in the SEPnet2 outreach programme (2013-18) raising the physics aspirations of school children, especially now in primary schools, and improving our assessment regime. A full-time Outreach Officer is funded until 2016 (via the Ogden Trust and university funding) and is now fully integrated into the SEPnet2 programme under the guidance of the SEPnet2 Outreach Director.

iii) Strengthen our involvement in online “citizen science” projects through deeper involvement in the “*Zooniverse*” (www.zooniverse.org). This has already begun with a successful EPSRC bid by Joe Cox (Economics) and Karen Masters (ICG) to the EPSRC “Digital Economy” Initiative (total £750,000 over 3 years) to study the economic impact of such online participation networks. The University of Portsmouth is also providing funds for the university to become an official member of Zooniverse and the “Citizen Science Alliance”. Gupta and Masters are involved in “Zooteach” (zooteach.org) which is building online teaching tools and materials based on Zooniverse projects. This work extends our original Galaxy Zoo success (see “*UOP09GALAXY*”)

iv) Develop robust methods for recognising impact as a key part of academic career development. This will be done in part through use of performance development reviews promoting greater engagement of researchers in impact. In July 2013, we appointed Masters to a proleptic senior lectureship (beginning October 2014) in recognition of both her research and her public engagement work.

v) Support ICG researchers to explore the commercialisation of their research, working with the University’s Research and Innovation Services and SEPnet2, which is developing a collaborative impact strategy, setting up a framework of initiatives, activities and publications. SEPnet is in discussion with STFC to host an Innovation Partnerships Scheme Fellow who will broker researcher engagement with business. We plan to host an STFC Innovations Club event as part of the National Astronomy Meeting in Portsmouth in 2014.

vi) We will work in collaboration with colleagues in other departments delivering our new applied physics courses, to explore the commercial impact of the growing physics activity around the university.

vii) We will expand the broader influence of our research by encouraging ICG researchers to serve on scientific advisory boards and panels in funding agencies and other public bodies.

d. Relationship to case studies

The majority of our impact is through public engagement, which is reflected in two of our impact case studies. “*UOP09GALAXY*” demonstrates the importance of encouraging our staff (Nichol & Masters) to invest time in online public participation projects that subsequently provided both impact and high quality science results. “*UOP09HIGHIMPACT*” results from our strategy to develop professional and sustainable local public engagement. Such an ambition is aligned with the SEPnet2 outreach programme and will continue. “*UOP09EUCLID*” demonstrates the long-term economic impact of our research through our roles on public bodies and expenditure.