IoP Communicators Conference 2023

16 November 2023
Institute of Physics, London, UK

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IOP Institute of Physics

Welcome and Keynote (10:00 - 11:00)

This Won't be a Very Good Talk: Lessons in Communication Online and Offline

Professor Chris Lintott[1]

[1]University of Oxford

In this talk, Chris Lintott (BBC Sky at Night, Zooniverse.org) will reflect on his practice of science communication through the development of online citizen science projects, talks at venues from a fire pit in Northampton to the Royal Albert Hall, and walks with a dog. It will introduce the idea of 'threshold fear' - and how to overcome it - and conclude with a set of challenges to anyone talking about science.

Morning Session (11:10 - 10:55)

Lessons learned from the RAS200 project

Dr Sheila Kanani[1]

[1]Royal Astronomical Society, London, United Kingdom

In 2013 the Royal Astronomical Society trustees conceived an idea called “Astonishing Astronomy and Glorious Geophysics” which was to be a £1million outreach project to engage in astronomy and geophysics projects with groups the RAS had not previously engaged with.

The investment was made to commemorate the RAS at 200 years old, and the long-term plan was a celebration of astronomy and geophysics and an intention of supporting ‘projects that promote understanding, discussion and dialogue around astronomy and geophysics in diverse sections of the community’, culminating in 2020 with the RAS bicentenary.

The Society wanted to create grass roots projects that could extend the appeal of the organisation into new areas of the wider society. We wanted a legacy of embedding astronomy and geophysics that ensured these sciences retained their appeal, inspiring people from all walks of life, and setting the RAS on a new course for the next 200 years, as an outward looking, diverse organisation.

The stated aims for the programme were:

- To have a lasting impact beyond 2020 and inspire a new generation to broaden their interest in science, technology, engineering, maths and medicine (STEMM).
- To go 'where no outreach project has gone before', engaging people from diverse backgrounds.
- To harness the shared ambitions of world-leading researchers and national, local and community organisations.

Fast forward 10 years and the project celebrated its close, delayed due to the COVID pandemic, finishing officially on the 9th February 2023. In that time grants were awarded to 12 partners, spending almost £900k between 2015 and 2022, spanning the UK, Ireland and even South Africa. The direct reach was in excess of 220,000 people, but the indirect reach is immeasurable, and may have a longer-term impact that we simply couldn’t have imagined. In addition to the 8 years of evaluated projects, we also look forward to a future of legacy projects, partnerships, and newly forged friendships, all thanks to the transformative properties of astronomy and geophysics.

In this talk we would like to highlight some of the lessons learned from this long-term community based public engagement and outreach project.

How to be more queer-friendly: improving the experience of transgender speakers, guests, and audience members.

Mx Cecilia Astolfi[1]

[1]Freelance Educator, United Kingdom

As science communicators, we owe it to ourselves and our audiences to eliminate every possible obstacle to participation; this should include tackling transphobia. However, as a non-binary person, I often feel erased or excluded when applying to events or participating in them. The entire process, from producing a registration form to collecting evaluations, could be made more inclusive with simple (but significant) changes. In this talk, I will outline sector-specific issues, their impact, and suggest alternative approaches to improve inclusion.

Safe Space: Developing multisensory resources for disabled children

Josie Rawes[1], Katherine Leech[1]

[1]School of Physics, Engineering and Technology, University of York, York, United Kingdom

Children with complex disabilities and cognition and learning needs are often overlooked in the provision of STEM (science, technology, engineering and maths) activities. Yet working with such audiences can be hugely valuable to all involved. Even where it will not lead to a career in STEM, STEM offers a unique way to inspire young people and can improve a disabled child's self-confidence and enjoyment of life. Creating opportunities for disabled children to love and learn from these subjects has significant individual and social impact. In addition, working with these audiences isn't just of benefit to the children involved. The process of developing suitable resources and activities challenges us as communicators to rethink our approach and work in collaboration to develop multisensory content that can benefit children across the educational spectrum.

In this short talk, we will describe our experience of working with the Lightyear Foundation, a charity that aims to break down barriers to disabled children taking part in STEM, and a special needs school to develop multisensory workshops themed around space exploration. Our approach used virtual reality headsets, dark dens, tactile objects of different temperatures and textures, dressing-up, and edible space food to create an immersive experience that gave the children the autonomy to choose how to engage with the session. We will share our learning around working in collaboration and integrating established practices from experienced practitioners into a new context, as well as lessons learned about how using the same practical techniques can improve our wider outreach and public engagement work. Although our project is only in a very early stage, it is already transforming our approach to engaging with diverse audiences.

Physics engagement through non-formal coding clubs

Tamasin Greenough Graham, Fergus Kirkpatrick[1]

[1]Raspberry Pi Foundation, Cambridge, United Kingdom

The European Astro Pi Challenge, run by the Raspberry Pi Foundation and European Space Agency where teams of young people up to 19 years old write a computer program in Python that is subsequently run on the International Space Station (ISS). In 2023, Astro Pi is setting young people the challenge of writing a program that uses the Astro Pi's sensors and camera to calculate the speed that the ISS is travelling in Earth's orbit.

This activity can take place in the classroom, but by delivering the activity through Code Clubs, we take advantage of the non-formal environment where young people are supported to have agency over their own learning both in terms of programming and meta-skills such as initiative, adaptability and creativity.

Feedback from club leaders tell us that the Code Club environment develops science capital in the young people who attend, most importantly in their feelings of belonging to a community as well as developing their wider understanding of the interrelation between computer science and physics.

In this talk we will introduce the 2023 updated Astro Pi project, Mission Space Lab, and share our learnings about the benefits of using non-formal education as an environment for engagement.

Ethics and Engagement: Let's start thinking about it.

Dr Dominic Galliano[1]

[1]Freelance Consultant, Manchester, United Kingdom

When do we think about ethics? Is it when we want to publish evaluation of our science communication project? Or when we are collecting data from our project participants (probably school students) for reporting? Do we only think about ethics as an organisational process? Do we ever take a moment to think about the ethics of our overall project? Is your communication ethical? In this short talk we will summarise some learning from other disciplines and the wider engagement sector and start to think about how we can apply the learning to our practice.

Workshop Session (13:10 - 14:10)

Improv for Physics Communicators

Dr Kieraan Shah[1]

[1]Freelance Project Manager

Communicating to different audiences can bring us outside of our specialisms (and comfort zones) taking us to unexpected places. This friendly workshop will explore how you can embrace uncertainty, use practical improv skills in your communication practice, and have some fun along the way.

Please note: participants can join in at their own level and will not be put on the spot, only willing volunteers will be used for demonstrating any of the activities. The workshop is not physically demanding and you will be able to move around, stand or sit according to your preference during the workshop.

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This workshop will explore how we as a community approach ethics. Come and join us as we ask the questions of why consider ethics, and how do we approach it. Bring your curiosity, your questions, and any case studies of past work.

Making science engaging to people with learning and physical disabilities

Dr Claire Malone

[1]The Lightyear Foundation, York, United Kingdom

People with disabilities are severely underrepresented in STEM fields in the UK due to the barriers they face often from an early age. This is detrimental both to the advancement of STEM and society as a whole as a plethora of evidence shows a workforce that isn't diverse tends to narrow focused solutions. The unique ways in which disabled people interpret and interact with the world, typically perceived as an obstacle to their inclusion, are arguably among humanity's best chances at solving some of our planet's biggest problems.

The workshop spotlights techniques and best practice used in making science engaging to an audience with learning or physical disabilities. I draw upon my own experience negotiating a scientific career with a significant physical disability as well as my role as the STEM Lead of the Lightyear Foundation, specifically the lessons learned from designing our Virtual Physics Labs. I identify specific strategies that form an essential toolkit when catering for this audience, designed to support outreach professionals in making their activities more inclusive. Evidence has shown that our students found experiments with a tactile element more engaging e.g. including something to feel, smell or taste. Discussion on how techniques could be applied to other outreach activities is encouraged.

Afternoon Session (14:20 - 16:15)

Sharing the Magic of the Night Sky with Special Needs Children

Dr Emma Chapman[1]

[1]University of Nottingham, United Kingdom

For over a decade, we have run an inflatable planetarium show that goes into local 'widening participation' primary schools for free. This year, we stepped away from that initiative, feeling that it was somewhat a saturated market. I identified two communities that do not traditional benefit from astronomy outreach: retired communities and special needs schools. I will speak about how I secured funding for these projects, found the resources to develop a new program and learned the new skills necessary for communicating with these two groups. Our decision to share the magic of the night sky with children with complex and profound learning and medical needs presented a real challenge, that required community engagement and new consideration of impact. Ultimately, we hope to have developed a programme that other astronomy groups can share with the children of their local special needs schools.

A collaborative approach to outreach

Mrs Laura Gray, Dr Iain Moore

[1]Strathclyde Institute of Education, University of Strathclyde, Glasgow, United Kingdom

Physics, and STEM in general, can be challenging to 'sell' to an audience. When considering why we are providing events, it is often to try to "bridge a gap" or draw attention to a difficult to grasp concept. We are likely to encounter participants who have negative feelings about the subject matter. For this reason, approachability is central to our attitude to science communication. Alongside this, we look for familiarity – in what we present and in how we relate our work.

Coming from an educational background, our take on communication centres around a knowledge of the starting point for those we are working with. As with all of our work, this comes from a point of the importance of sharing ideas. Our first consideration is who our audience will be and how we can ensure buy-in and interaction with us and our activities.

In this talk, to set the scene, we will briefly describe the types of outreach we have worked on, including some with the IoP. We will discuss the lessons learned from these events as we begin to grow our contribution to the world of science outreach. Two key messages are apparent – the need for real world consideration, and the readiness to not know the answer.

We will focus on our funded project with Early Years practitioners to describe what it taught us and how we used this knowledge to develop the techniques which are core to our outlook. This will lead us onto the crucial points of the design and delivery of all our outreach around some non-negotiable central themes.

It is essential for us to be honest about not having all the answers, and this is key to our conversation about the elements of communication which we believe make outreach successful. We will give the audience examples of what we have learned through our work with others, and then pose some questions which we want to use as part of our ongoing dialogue to think about collaboration from a different angle.

Please note this abstract is a joint submission between Laura Gray and Iain Moore, both as presenters as discussed by email before submission.

Reaching Wider STEM workshops: lessons learnt from a year of design and delivery.

Dr Alys Jepson[1]

[1]University Of Bangor, United Kingdom

Reaching Wider (North and Mid-Wales partnership) is a HEFCW funded project to widen access to higher education by engaging a target cohort of young people with postcodes in the bottom 40% of the WIMD (Welsh Index of Multiple Deprivation). A STEM outreach program began this year, aiming to increase the science capital of pupils in years 5 and 6 (KS2), using students from Bangor University for delivery. To this end a program of 3 workshops has been enjoyed by 11 schools to date (~50% Welsh language).

One of the valuable lessons we have learnt when delivering is that workshop content will evolve rapidly with experience if you remain flexible and willing to learn from the pupils. Workshops initially had ambitious aims of being narrative driven, interdisciplinary, consisting of open-ended investigative tasks using everyday equipment, incorporating career information and family engagement. Although these aspirations remain, we have learnt that they are sometimes in conflict with the fact that simplicity rules. This talk will describe specific classroom examples of the pupil driven compromises we've made to ensure effective content for a challenging cohort in a bi-lingual, geographically complex area.

Gravity Spy: Co-discovery from gravitational-wave data through community science

Christopher Berry[1], Gravity Spy[2]

[1]University of Glasgow, United Kingdom, [2]Various,

Gravitational-wave detectors have opened up a new branch of astronomy. Data from gravitational-wave detectors contains should bursts of noise, known as glitches, that hinder our ability to analyse the data. Glitches may have a range of instrumental and environmental origins. The Gravity Spy project contributes to understanding glitches through combining the efforts of volunteers on the Zooniverse platform with automated analysis provided by machine-learning algorithms. Zooniverse volunteers are provided with a levelled training system and tools to support their investigations of glitches. Using this framework, volunteers have been able to identify new classes of glitches, and produce results comparable to those of detector-characterisation experts. This demonstrates the potential of engaging members of the public with complicated research tasks. In this talk, we will review the Gravity Spy project, highlighting how our volunteers have made discoveries, and discuss future plans to provide volunteers with new ways to investigate the causes of glitches.

Using STEM Attributes in outreach

Dr Carol Davenport[1]

[1]Northumbria University, United Kingdom

STEM employers indicate that they value transferable skills linked to character and personal attributes [1]. Using published literature (e.g. [2][3]) and discussions with educators the authors have developed a set of 15 attributes for use in STEM Engagement interventions for children and young people. Interventions were designed following a Theory of Change [4] and aimed to strengthen children's view of STEM as something done by 'people like them' by enabling them to identify attributes that they shared with STEM professionals.

In this talk, participants will hear about the attributes identified by a survey of over 200 STEM professionals. We'll also share examples of a range of resources that make use of these attributes as a way of helping children and young people to see that STEM is something done by people like them. Finally, participants will consider how this approach could be adapted for their own engagement practice.

[1] CBI (2019) Education and learning for the modern world available at https://www.cbi.org.uk/media/3841/12546_tess_2019.pdf
[2] McDonald, A. (2014) “Not for people like me?” Under-represented groups in science, technology and engineering. WISE Campaign report
[3] Science Council n.d. https://sciencecouncil.org/about-science/10-types-of-scientist/
[4] Davenport et al., (2020) A Theory of Change for Improving Children’s Perceptsion, Aspirations and Uptake of STEM Careers. Research in Science Education, https://doi.org/10.1007/s11165-019-09909-6

Engaging amateur astronomers in the Hunting Outbursting Young Stars citizen science project

Carys Herbert[1]

[1]University Of Kent, United Kingdom

The Hunting Outbursting Young Stars (HOYS) citizen science project collects amateur astronomy data of nearby (<1 kpc), young (<10 Myr) star forming regions to conduct long term broadband photometric monitoring. Since the project launched in 2014, it has gathered over 93000 images. The rate of image submission is increasing and we ultimately aim to have one image per broadband filter per day. The project has published papers on a range of young stars science topics, including identifying periodic variables, characterising surface spots, and individual object behaviours.

In this talk we will focus on our recruitment and engagement strategies. Our primary recruitment strategy is connecting with audiences through talks at amateur astronomy societies and conferences. We have found that engaging in frequent small-scale talks leads to major increases in contributions.

Maintaining engagement is crucial in order for us to achieve our high cadence goals. We incentivise participants with authorship credits on published papers, which recognises their invaluable contributions. We keep in contact via newsletters and a feature called “lightcurve of the week”, as well as sharing participant perspectives to generate a sense of community.

We are proud to be in our fourth year as a Global Sky Partner with the Las Cumbres Observatory (LCO). By supporting students and teachers to use the LCO network of telescopes to obtain images for HOYS, we are not only expanding the project but also working with the next generation of astronomers.

Discovery Planet HQ - outreach activities delivered from a high street shop

Dr Vicky Mason[1]

[1]Discovery Planet Cic, Canterbury, United Kingdom

Discovery Planet HQ (DPHQ) is a science venue on Ramsgate High St. It is the latest project from Discovery Planet CIC, a community group led by Nikki Hildesley, Dr Vicky Mason and Xanthe Pitt. In 2020 they were awarded an STFC grant to establish a longer-term venue (DPHQ) in Ramsgate. DP has a history of developing and delivering science activities to schools and the public in Thanet going back 10 years.

Before setting up DPHQ, all DP’s activities were individual “pop-up” events which took place in local venues, including disused theatre spaces, cafes, market stalls, a church and the beach. The limitations of this approach led them to look for a more permanent venue in order to prioritise long-term repeat interventions over ad-hoc one-off activities. This drew upon the work emphasising the social context of informal science engagement, exemplified by the Science Capital work.

The Isle of Thanet is geographically peripheral within the UK, a coastal town that is now one of the 20% most deprived districts in England with significantly worse health outcomes than England as a whole.

This short talk will disseminate the main learnings from this innovative project which draws on local grassroots expertise and connects them to academic and industry partners. This locally-embedded and long-

term approach to science engagement has allowed engagement with every primary school in Ramsgate (many with repeat visits) as well as diverse groups from the local community. The core offer of orthodox science activities delivered in an unorthodox setting has allowed relationships to develop over time with local SEN schools, home school groups and unaccompanied asylum seeking children (UASC).

Space in Schools: Teaching physics through dance.

Joanne Pledger[1], Cherry Canovan[1], Ruth Spencer[1]

[1]University Of Central Lancashire, Preston, United Kingdom

Into Our Skies: Space in Schools' is a cross-curricular approach to teaching science through dance developed as a response to the COVID-19 pandemic and home schooling. The 6-week scheme of work used movement and dance as a tool through which pupils aged 9-11 could explore concepts of Earth and space, alongside a set of practical classroom activities. Surveys conducted with teachers who used the scheme of work concluded that the science learning achieved in the dance aspect of the programme was equal to the more traditional classroom activities. Meanwhile, 80% of teachers reported an increase in curiosity in the pupils in the dance session, and the same proportion saw an increase in participation among pupils who would normally not engage in science lessons. At an age when attitudes to science are becoming fixed, this cross-curricular approach could be vital in increasing the achievement of pupils and maintaining their interest in science.

Warwick Institute of Engagement - a different way of working together?

Dr Rachel S Edwards[1], Professor Helen Wheatley[1], Dr Andrew Todd[1]

[1]University of Warwick, Coventry, United Kingdom

The Warwick Institute of Engagement is a new initiative to encourage and support public engagement across Warwick university, bringing together academics, students, and professional service staff from across all faculties. We have seen a lot of benefits from working together more closely across the university, including support for people who are currently 'lone-voices' for engagement in their own departments. This short talk will describe how we encouraged the university to move to this new model, and some of the opportunities it has offered for physicists to work with other departments and external artists, including a short project using physics to help people experience music in different ways (e.g. by touch).

Removing barriers to enable meaningful and inclusive science work experience for young people

Miss Helena French[1]

[1]University Of Nottingham, Nottingham , United Kingdom

Work experience gives students the opportunity to gain a realistic insight into the workplace and support them to identify careers that may interest them (Buzzeo and Cifci, 2017). However, observations of current work experience taking place indicate that opportunities in science are often difficult to identify and time consuming to organise. The impact of this leading to the students with personal links to universities being more likely to secure a placement than those without. Within the Faculty of Science, we looked to address these barriers and implement a programme that reached a diverse set of local young people, minimised organising pressure on contributors and gave participants an insight into a breath of science areas. This project worked with 21 year 10 students from local schools and widening participation backgrounds. Participants meet a range of staff and took part in realistic work tasks from all schools within the Faculty of Science.

The project showed an increase in understanding of technical (from 14.3% to 80.9% agreeing or strongly agreeing to knowing a lot) and research (from 19% to 81.3% agreeing or strongly agreeing to knowing a lot) careers. In addition 72.7% participants agreed or strongly agreed that the week helped them find a specific area of STEM that they are interested in and 86.4% agreed or strongly agreed that it gave them the opportunity to develop skills in a specific area of STEM they are interested in.

In this presentation I will explain how our project was structured and participants, student helpers and staff recruited to create a meaningful and impactful experience for 21 year 10 students. The presentation will focus on some key learnings that can be implemented across organisations.

Buzzeo, J. and Cifci, M. (2017). Work experience, job shadowing and workplace visits. What works? www.careersandenterprise.co.uk, 2–7 Clerkenwell Green, London, EC1R 0DE: The Careers & Enterprise Company, pp.9–13.

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