

Stories from San Fransisco: @LaurieWinkless at #SciFoo



SciFoo - also known as Foo Camp - is a gathering that's unique in the world of science. Rather than being a conference on a particular discipline, where specific topics are presented and then discussed over a series of days, SciFoo is an 'unconference' - a lightly-structured, informal gathering of peers from right across the scientific spectrum. There is no predefined agenda, and until the invite list has been finalised, campers have no idea who they'll spend the three days talking to. You can't 'pitch yourself' to get in - former campers are asked to suggest people to invite, and most people only get to attend once. Oh, and it's held at the Googleplex, California.

[Read more on Laurie's blog here.](#)

Well Behaved Women Seldom Make History

The International Conference on Women in Physics (ICWiP) is a triennial meeting that looks to "understand the severe under-representation of women worldwide and to develop strategies to increase their participation in physics". 2017 marked its first time in the UK: a four-day event that featured distinguished speakers from across the world, several workshops and plenty of networking opportunities. Here's what Anu had to say, "If you had told me I'd leave ICWiP 2017 having made friends, and having learnt from and laughed with some of the greatest minds from around the world, I would have laughed in your face. Having just graduated from my first degree, I was unnerveous to walk into a conference full of incredibly talented and qualified women from around the world. Within hours, however, I had learnt so much about the diverse backgrounds and disciplines that all the women at this conference had come from, and was left inspired by the end of the first day!".

[Read more on Science Grrl here.](#)



Physics on the big screen? We've arrived. [@samlllingworth](#)

On Monday 3rd July the Institute of Physics hosted an event at the [Manchester Central Library](#), in conjunction with Manchester Metropolitan University and [Into Film](#), a charity which works with young people, using film to support their academic, cultural, and social development.

One hundred and fifty local school children from across the Greater Manchester region were invited to watch a free screening of the 2016 Paramount Picture sci-fi film *Arrival*, directed by Denis Villeneuve and starring Amy Adams and Jeremy Renner, followed by a question and answer session with a panel of experts, hosted by [Dr Sam Illingworth](#) and [Dr James Redfern](#), from [The Neutrinos are Mutating](#) podcast.

Sam and James were joined by [Dr Rob Drummond](#), a Senior Lecturer in Linguistics from Manchester Metropolitan University and [Dr Sophie Nixon](#), an astrobiology expert from the University of Manchester. In the film, Amy Adams' character is a professor in linguistics who is tasked with unravelling the language of an alien species that has mysteriously appeared on Earth, and the school children really put the panel to the test, asking questions ranging from the reality of the alien language that is used in the film, to the plausibility of life on other planets. The panel were really impressed with the quality of the questioning, and presented a copy of Ted Chiang's short story collection *Stories of Your Life and Others*, (which includes the short story on which *Arrival* is based) to the student with the most challenging question. Without giving away any spoilers to those of you who are yet to watch the film the question involved a consideration of the relationship between the atmosphere on Earth, and that within one of the alien ships.

The whole event was recorded live, and can be listened to on the TNAM podcast, [which is available via iTunes](#).

Thanks to everyone that helped to make this such a memorable event, especially Tarah Patel from Into Film North, without whom the screening would not have been possible.



Astronauts: Do You Have What it Takes?

Millions dream of going into space, but how many of us have what it takes? Astronaut Chris Hadfield and his expert team will choose one winner from 12 exceptional applicants. From the Guardian. [This series is the anti-Apprentice. These are pleasingly modest but seriously accomplished individuals \(surgeons, quantum physicists, nuclear engineers etc\) who understand that the journey is as important as the destination. Along the way, everything from mental agility to buried personality traits are probed – and it's quietly fascinating.](#)

The show is available at the BBC website: <http://www.bbc.co.uk/programmes/p05bfjlt>

Hidden Figures: Women in Science Wikithons



Earlier this year, "Hidden Figures", a biographical account of three brilliant African-American women at NASA became a box office smash-hit; to date it

has made more than \$230 million dollars. Amongst young people there is evidently an interest in the narrative that leads to science and engineering discoveries, an enthusiasm for physics and a need for more context surrounding careers in STEM. Young spend more than 8 hours a day online; and whilst women making up 50 % of A-Level classes and undergraduate courses, they are not well represented at senior levels. Systematic bias within Wikipedia has means that women in science are woefully underrepresented. Inspired by Hidden Figures, Dr Jess Wade, Dr Claire Murray and Dr Alice White have been on a mission: to increase the number of women in science on Wikipedia by getting school girls and the general public to research, create and populate their biographies. They've held one 'wikithon' a month, in schools, universities and learned societies.

Please contact jessica.wade@imperial.ac.uk or a.white@wellcome.ac.uk. You can find more information on the WikiProject: Women Scientists here: https://en.wikipedia.org/wiki/Wikipedia:WikiProject_Women_scientists

Climate Poetry

An invite for everyone to contribute towards a new collection of climate change poems. Twenty poems will be selected, with all proceeds going towards helping the Environmental Justice Foundation. For more information, and to submit your poem please visit this link:

tinyurl.com/climate-poems

Open Call for Climate Poets

Please submit your proposed climate change poem using this form. You can use any form or style of poetry, the only restriction is that the poem must be 40 lines or fewer.

20 of these poems will be selected to appear in a book and an e-book of climate change poems, all proceeds of which will be donated to the Environmental Justice Foundation, to help provide support for climate refugees.

The authors of the 20 selected poems will each receive a small honorarium as a thank you for allowing their work to be published in the proposed book and e-book. By submitting a poem to this initiative you agree to waive any royalties from the publication of the proposed book and e-book, although you are free to submit this poetry to other books and poetry collections. On the proviso that no author stands to make any money from the Climate Poetry project (other than the potential honorarium for the selected poets), the copyright of each poem remains with its author.

Poems in any language are welcome (not just English!), and from people of any ages, but if you are under 18 please make sure that you have permission from a guardian. :-)

Deadline: 30th September 2017 (23:59 GMT) *please use this link: tinyurl.com/climate-poems*

Notes from the Beamline, @drclairemurray

Conferences are always one of the most interesting places to go. They inspire discussion and debate and are often the source of new collaborations and ideas. In our case, it was at a conference in New York where we came up with the idea to get 1000 secondary schoolchildren to help us with our science...! We work at Diamond Light Source which is the UK's national synchrotron (come visit us - it's free!

www.diamond.ac.uk) and we have access to some of the most amazing technology including one giant blue robot which would aid us in our goal: to collect a powder diffraction pattern (which you could think of as a fingerprint) for each calcium carbonate sample synthesised by secondary school students in 24 hours. Schools already carry out the calcium carbonate reaction so we were just asking for them to add in one extra additive (from a list of 25) in varying concentrations to see how we could influence polymorph formation in CaCO₃.





Inside the Diamond Light Source

Alice is a summer placement student at Diamond which is an annual scheme we run every year covering all sorts of science and engineering disciplines (<http://www.diamond.ac.uk/Careers/Work-Placement.html>). Her somewhat mammoth task this summer is to analyse all of the data and identify if there are correlations within the different groups of additives. Alice has been writing an excellent blog about the data analysis process in an accessible way for the students, and we highly recommend you check it out:

Hi! I'm Alice and I've just joined the Project M team in Diamond for a twelve-week summer placement. I'm an undergraduate studying physics at the University of Bath, and will start my final year in October. My job at Diamond will be to analyse the data collected from the huge diffraction experiment that was done as part of Project M here at Diamond back in April. As you may have guessed, there are a lot of data! However, using various software packages we hope to be able to spot trends and draw some conclusions on how and why different types (polymorphs) of calcium carbonate (CaCO_3) form..

Time has flown by, which is quite daunting when you have 770 sets of diffraction data to sort through and analyse! Luckily there are plenty of tricks and tools here at Diamond to make swimming through this sea of data a bit easier than it sounds...

The most crucial of these is specialist software. I'm using a few software packages to help my analysis. DAWN (Data Analysis WorkbeNch) is a program written by staff in Diamond and I'm pretty sure it can basically do anything – although I'm still looking for the "make a cup of tea" function. Did I mention the free tea and coffee here?

I've also had a tour of ISIS, the neutron facility here on the RAL campus with Diamond, with the other summer placement students. It was awesome! If you ever get a chance to come to RAL or Diamond for an open day or tour then make sure you do. They do all sorts of things at ISIS, just like Diamond, but instead of shining x-rays at samples to find out more about them, they bombard them with neutrons. This gives different information than can be obtained from x-ray experiments, as neutrons interact with the nucleus of atoms as opposed to electrons.

Follow Alice's adventure here and [Project M](#) here.

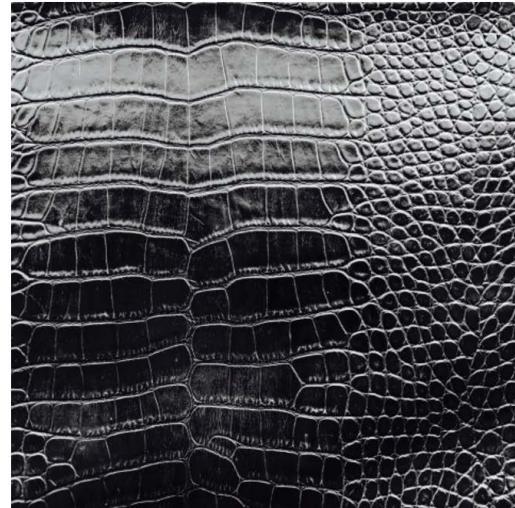
Fake: an [Open Call](#) from the Science Gallery

OPEN CALL: Science Gallery Dublin is seeking proposals for up to 20 works for FAKE, a free exhibition that asks if life is better when we embrace the artificial. Deadline for applications is 19th September, 17:00 Dublin time.

From fake meat to fake emotions, if faking it gets the job done, who cares?

In both the natural world and human society, faking, mimicking, and copying can be a reliable strategy for success. When the focus is on how things appear, a fake may be just as valuable as the real thing. But

Polymorphs are the same chemical elements in the same ratio, but they pack differently in the crystal structure. Vaterite and Calcite are the two we were most likely to see given our previous research. This experiment happened back in April and we were able to live broadcast the whole thing online (<http://www.diamond.ac.uk/ProjectM/>) as well as provide ongoing updates on Twitter (@DLSProjectM). We were so pleased with the enthusiasm and excitement of the students and they send us some fantastic photos! However, it does mean we have a huge amount of data to work through, which is where having a brilliant student like Alice Richards (3rd Year Physics undergraduate at the University of Bath) helps massively.



FAKE

SCIENCE GALLERY DUBLIN

LIVE



Open for submissions from
3rd August 2017, 1:00pm IST to
19th September 2017, 5:00pm
IST

what about faking taste, emotions, chemical signatures, facts and trademarks? Have patents, politics, and art given copying a bad name?

Fake designer handbags attract customers while fake eyes on insects scare off potential predators. From biomimicry to forged documents, from scandals to substitutes, we'll ask when is authenticity essential, when is copying cool, and what is the boundary between a fakery faux-pas and a really fantastic FAKE.

Proposals may be new or existing works, and will be funded up to a maximum budget of €2800, which should include all artist fees, materials, equipment, shipping, travel etc. Please note that these are maximum amounts and we enthusiastically welcome proposals that come in below the maximum budget.

Ask questions! If you're unsure about an aspect of your proposal, please email help@dublin.sciencegallery.com

Imagining the Sun, @DrDav

Imagining the Sun was a collaborative project between a poet, a composer, a visual artist, Northumbria University Solar Physics group and NUSTEM, with funding from STFC and Northumbria University.

The impetus for the collaboration came from coincidental contacts firstly between Helen Schell (visual art) and myself at an exhibition that we were both taking part in, and then from an approach from a colleague on behalf of Katrina Porteous (poet) and Peter Zinovieff (composer) about a planetarium based sound and words performance.

These initial contacts and discussions merged to become Imagining the Sun. We wanted to bring together artists, scientists and schools together to create work about the Sun. There were three strands to the project: schools workshops led by both an artist and solar physicist; a large-scale artwork, SOLAR, to be exhibited at Big Bang North East; and a poetry and sound performance, SUN, for the planetarium at Life Science Centre in Newcastle.

The STFC funding was used predominantly to support the artists, with NUSTEM and Northumbria University providing additional support both in kind and financially.

The project took on a life of its own and became bigger than initially planned. A suggestion from Prof John Woodward saw some members the project team presenting excerpts from the workshops and SUN at a literary festival in Keswick (Words by the Water). This led to the creation of SUN using a 2D version of the planetarium show produced by Jonathan Sanderson from NUSTEM using the soundtrack composed and mixed by Peter Zinovieff. Katrina and Peter have used this to perform at other festivals, and a version is available online: https://www.youtube.com/watch?v=_MpTiA2hFOE

We have also created a book which looks at the project from the viewpoint of the different participants, and contains a selection of Katrina's poems and Helen's paintings.

You can read more about the project here: <https://nustem.uk/imagining-the-sun/>

"This process of translation between scientists, artists and teachers is a really rich, collaborative way of learning. The students' enthusiasm and poems were extremely moving.' - Katrina Porteous

September 2017

Science and Technology Policy,
AnuLikesStars

Having come from a poorly funded state school in suburban London, I can easily say that if it weren't for the Royal Institution Friday Night Discourses, Institute of Physics programmes like the Physics in Perspective series, and online resources such as TED, I wouldn't have pursued and graduated with a Physics degree from Durham University this summer. It is obvious then, why I feel so strongly about the current political climate and the huge effect that it has already started having on the scientific community - but more specifically, the negative effect it is having on public engagement and outreach.

From stewarding at the March for Science in London this Spring to being part of the UK team at the International Conference for Women in Physics this Summer, I have been using every possible opportunity to learn about the impact of current politics on the STEM community, but also to speak out about how I believe that scientific research should always be a non-partisan issue, and why governments should now more than ever realise the importance of evidence based policy making. I have met many brilliant communicators from various STEM fields who are fighting the good fight to continue engaging young people in STEM. All in all, it has been a transformative year for me in realising that whatever future career I ended up in, I wanted to help bring together politics and the scientific community constructively.

I found myself applying for a Master's Degree in Science and Technology Policy at the Science and Technology Research Unit (or SPRU) at the University of Sussex, and will be using this next year to gain every skill possible to keep scientific research and engagement alive.

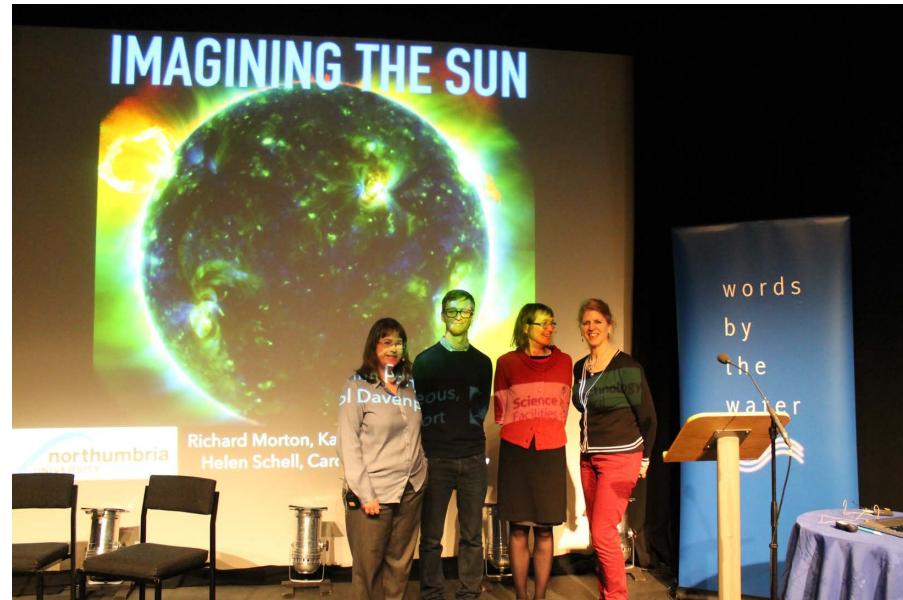


Visiting the UN

With Juno currently orbiting around Jupiter and collecting groundbreaking data, many ground based observers, like me, have planned their observing campaigns around this mission. I observe Jupiter's northern lights using the NASA infrared telescope in Hawaii, and an instrument, iSHELL, which can slit up the wavelengths of light. Observing the aurora in the infrared is very useful as it allows us to calculate the brightness, temperature, density and velocity of the charged molecules which are creating Jupiter's infrared aurora.

The most recent perijove was on 19th May, where Juno was only ~4500 km from Jupiter's cloud tops at the spacecraft's closest approach, and I was observing using IRTF remotely from my office in Leicester. This observation turned out to be the most dramatic of the year so far! First of all, due to a misunderstanding the telescope operator was late arriving at the telescope. Somehow I managed to call two random other place in the world before I made it through to Hawaii. Once the telescope operator had arrived at the telescope, opened up the dome, and slewed to Jupiter we realised that there was a problem with the computer programs. There are two programs, one which guides the telescope and the other which takes the data, and on this occasion they weren't communicating to each other. The situation was less than ideal as, instead of running an automatic program, I had to manually act out the steps. I had to align the slit at the northern polar limb of Jupiter, hit 'go' for a 30-second integration, move the slit to the next position in the scan and hit 'go' again, repeating this process until I had scanned the entirety of Jupiter's northern aurora. Although this may sound simple, having woken up at 4 am and trying to remember to keep count and occasionally move off Jupiter to take data of the sky, manually acting out the step was surprisingly tricky!

Despite all the issues the weather was beautifully clear and I did collect some excellent data of Jupiter's northern lights. All of this played out at the same time as Juno was busy collecting data as the spacecraft continued on its journey around Jupiter.



NUSTEM and the Imaging the Sun Project



Olivia Coleman and Olivia Williams in Mosquitoes

Mosquitoes, @crazy4pi314
Mosquitoes is on at the National Theatre until September 29. Here, we catch up with post doc Dr Sarah Kaiser to find out what she thought. "I love that it focused on the stories of two women, one of which was a lead scientist at @CERN. This is important because it allowed for a conversation about scientists as human. Everyone often thinks/says to scientists that "oh I could never understand your work" or "you're so smart". The fact is we all tend to do specialized work and won't understand all the details of anyone else's work. Society puts the stereotypical "lone wolf genius scientist" on such a high pedestal, but there is no reason to do so. It is bad for everyone. It reinforces who should or can be doing science as only economically stable white men. That sort of position of authority makes people believe blindly or fervently the words and ideas that come from the privileged "geniuses". As a consequence, being privileged can add a lot of mental stress and pressure to produce "answers" for which their mental health suffers." [Read more from Sarah here.](#)

Soapbox Science, Youmna Mouhamad

Soapbox Science is a novel public outreach platform for promoting women scientists and the science they do. We want to make sure that everyone has the opportunity to enjoy, learn from, heckle, question, probe, interact with and be inspired by some of our leading scientists. No middle man, no powerpoint slide, no amphitheater - just remarkable women in science who are there to amaze you with their latest discoveries, and to answer the science questions you have been burning to ask.

A very different style of sci comm

I first heard about Soapbox Science in 2015. At the time I had just obtained my PhD in polymer physics from Sheffield University and I was just settling in my new position as a researcher in printed electronics in Swansea University. The idea of standing on a soapbox and captivating the attention of passersby by talking about science was exciting and scary at the same time. By 2017, I had taken part in a wide range of projects, from the formulation of inks for piezoresistive sensors, the printing of resistive heater



Soapbox Science, Swansea

for sportswear to the printing of energy harvesting antennas for packaging. I had fallen love with the world of printing. I loved all of it from the different printing techniques to the formulation of functional coating and I wanted to tell everyone how cool printed electronics was. I decided to apply for Swansea Soapbox Science with a talk entitled “Screen printing, a technique with endless applications”. I was really excited and happy when my application got accepted. After I attended the first soapbox science briefing meeting, I realized that this was going to be completely different from a conference presentation or a seminar. 30 minutes in the middle of Swansea high street with no PowerPoint presentation speaking about science to people who were doing their weekly shopping. For a second I thought to myself, what did I put myself up for? When I regained my cool, I decided to bet everything on the props.

My story

The event was planned for 8 July 2017. I remember being anxious during the briefing with my amazing volunteers Zarie Tehrani and Jenny Baker. Luckily, the sun was shining in otherwise rainy Swansea, which was a relief. I had structured my talk in four independent sections starting from the history of printing and color printing, the making of ink, the demonstration of a printed pressure array, and the start of the show the screen printing of Nutella. Within the first 40 seconds of the talk, I demonstrated the printed heater by making a thermochromics layer to change color from black to white and got the audience to guess the manufacturing process and the working mechanism of the demonstrator. Then I got the audience to vote for the section they wanted to hear about. I was having so much fun that I didn't realize the time pass. I remember getting on the soapbox... and the next minute Jenny was telling me that my time was up.

A two way experience

I had put in lots of energy to make the talk fun for the audience but I didn't think that I will have so much fun delivering it. The audience were interactive and interested. I wasn't short of volunteers to drop-cast glitter dispersed in transparent resin to demonstrate the concept of percolation concentration threshold or to screen print Nutella. I was surprised by the amount of time and creativity it took to prepare the talk, purchasing the required item, preparing the props, making sure to meet the health and safety requirements and prepare my story line. Despite the effort I would recommend any scientist to try a similar experience; there is tremendous satisfaction in sharing the passion of science and engineering with a non-scientific audience.



Youmna Mouhamad @ Soapbox Science, Swansea

We are looking for passionate volunteers to establish new Soapbox Science events in their local areas. In order to apply and help grow the Soapbox Science initiative, please fill out the online application form: <https://goo.gl/tNJtXC>. The deadline to apply to become a Local Organiser for our 2018 festival is the 15th of October, 2017. If you have any questions, please email soapboxscience@gmail.com

A message from Lab 13's Inventor in Residence: [@helpfulscience](#)



Carole Kenrick in Lab 13 Gillespie

A few of months ago I was asked to host children from another local primary school, and “do something about science with them” as part of their science week programme. I am used to “doing science” with children - I am the Scientist / Inventor in Residence at Gillespie Primary School (see [@Lab_13Gillespie](#) for a taste of what that looks like in practice). I invite children to submit their questions about science and ideas for inventions, and then bring them into my lab in the school to investigate their questions and turn their ideas into reality. This, however, was a whole other proposition - no questions from children, no topic or theme except “science”.

nature of science - in particular, about hypothetical modelling. I also used this opportunity to address some misconceptions around who can be a scientist. I found some photos and names of scientists from the [Royal Society of Chemistry's 175 faces](#), carefully choosing a diverse range of ages, ethnic backgrounds and contexts (in the lab / field / at home with family) and balance of gender. I asked the children when they entered my lab to guess which of these people are scientists, and which are not. They played right into my hands. “She can’t be a scientist, because she is sitting on a sofa with a baby”, “He can’t be a scientist, because he’s in a lab and that’s too obvious”, and “I have no idea” were typical responses. They responded well to the twist: they’re all scientists!

The feedback I received was striking - so many of the children commented on their surprise about this task, even though it was only the first 5 mins of the session. Based on this experience, I would urge all physicists and scientists in general visiting schools to consider starting their visit like this if appropriate. If we want to make a difference to the gender imbalance, we need to deal with the misconceptions that are endemic - and which start young.

If you are a physicist who would like to visit a primary school, the Ogden Trust funds and supports primary physics partnerships across England. Get in touch with your nearest [Regional Representative](#) to be put in touch with a school and to get support with your visit.

At IOP Physics Communicators HQ, we loved Carole’s blog about STEAM clubs. Here’s a taster: Read more at: <https://medium.com/@HelpfulScience/how-and-why-do-you-run-a-science-stem-steam-club-9d245c97c027#.swppmkb47>

Here are some ace primary science resources: <https://padlet.com/StMarysresources/StMaryScience>

Physics & Politics, Alex Narduzzo

The peculiar coincidence of a snap General Election being called for the day before our Physics and Politics meeting was noted. David then introduced the first speaker, [Andrew Steele](#) from [Science is Vital](#) (<http://scienceisvital.org.uk>), presenting on the work and impact of his organisation. Andrew, a computational biologist by training, presented a wealth of statistical data his organisation has put together to establish how much Government really invests in research, and what the actual cost of research is when compared to other big spending items. Government spends £720bn every year, corresponding to £11,500 per person per year; of the £11,500 per person per year, only £160 goes into research, compared, for example, to £2,000 for healthcare and £600 for defence. He highlighted how diseases such as cancer and dementia currently cost the government one hundred times more than the investment being put into trying to look for a cure for them. He explained that, although investment in combating cancer for example (£100bn pounds since the 1970s) may seem like a lot of money, it has led to cancer patients living on average about four years longer, costing less than £100 per person per extra year of life added. Similarly, when comparing the cost of the LHC project to date (about £2.5bn) to Crossrail costs (£15bn) or the projected cost of fusion research (£60bn) with the revenues of iPhones (£125bn) or the profits from iPhone sales (£65bn), then one can appreciate how those investments are not

Medium



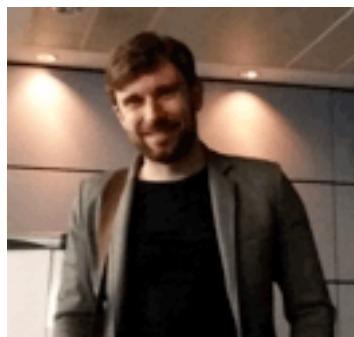
Carole Kenrick [Follow](#)
Welcome to The Really Helpful Science Education Blog
Jan 19 · 6 min read

How (and why) do you run a Science / STEM / STEAM club?

Most of my experience of this is at primary level, but having also run secondary science clubs in the past I can confirm that it is all still relevant to older pupils! The following guide is the result of running quite a few different clubs with children from nursery to Y13, and I will keep adding to it as I keep learning.

But first, I think it's worth highlighting why I run these clubs. My pupil surveys reveal how much the children in my school love the clubs and the extent to which they develop scientific knowledge, attitudes and habits of mind. On a much greater scale, the [ASPIRES](#) research project found nationally that participation in science clubs is correlated with higher science aspirations.

Andrew Steele, *Science is Vital*



so exorbitant given the long term returns they deliver for us all. Another interesting comparison is between global health research spending between 1981 and 2010 (£600bn) and the cost to the US only of the Iraq war (£1.8tn, yes trillion...).

Andrew further told the audience how public funding of research as a percentage of GDP is lower in the UK than the average contribution in the G8 or 28 other EU countries, and this number has been going down or remained flat since 2013. He gave a snapshot of the nationalities of employees in his company and hinted at how Brexit may lead to difficulties in retaining such a diverse workforce. Brexit was also the subject of some questions at the end of Andrew's talk, and he added how the damage to the UK reputation, when trying to recruit scientists internationally, is a more crucial aspect that any money issues that may arise from Brexit.



Alex Connor, IOP

It was then the turn of **Alex Connor**, Head of Policy at the *Institute of Physics Policy Centre*, to present the work and impact of the Policy Centre (<http://www.iop.org/policy>). After describing the general mission and role of the IOP, including 'to serve the public interest by acting in an advisory, consultative or representative capacity in matters relating to the science and practice of physics', Alex explained how the IOP works with five governments, being active in all four UK Parliaments as well as the Irish Parliament, engaging with a huge number of departments and agencies. He further explored the various contexts considered by the IOP strategy for 2015-2019, including interventions in Education, Economy, Society, Discovery and Community, on focus areas such as diversity in physics, regulation of new technologies, energy generation and storage, defence and security. IOP interventions range from data briefs and case studies to Town Hall meetings, to election manifestos and Parliamentary events.

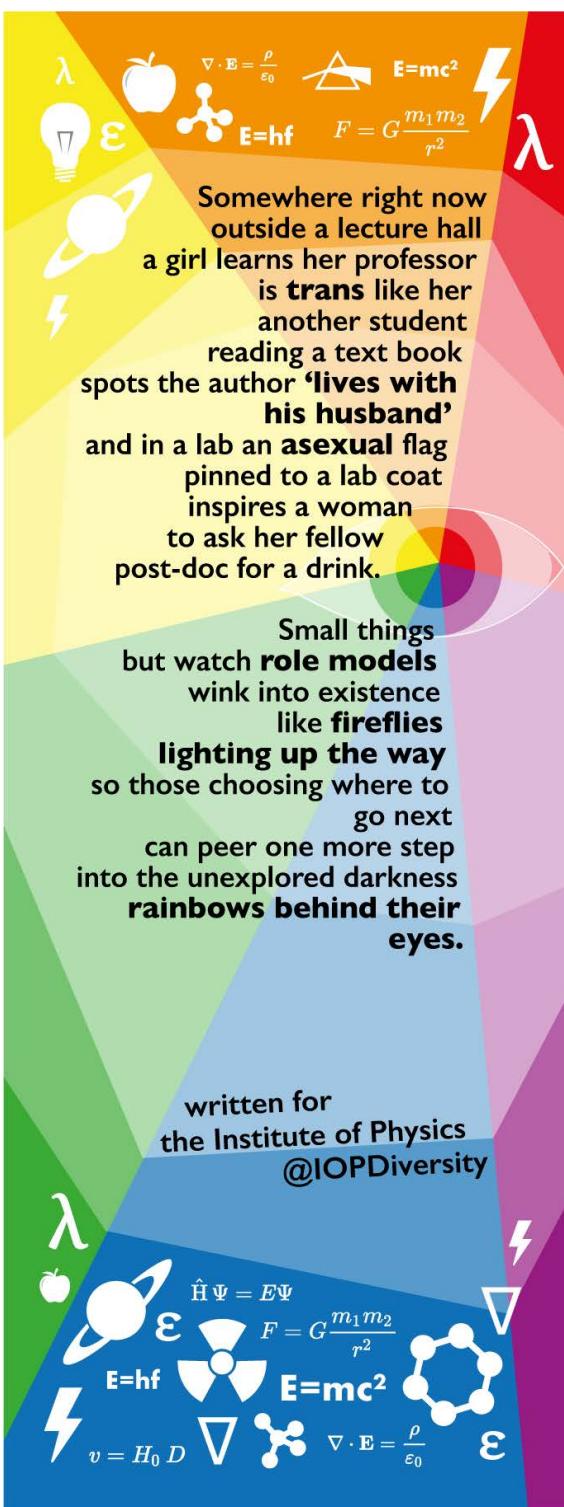
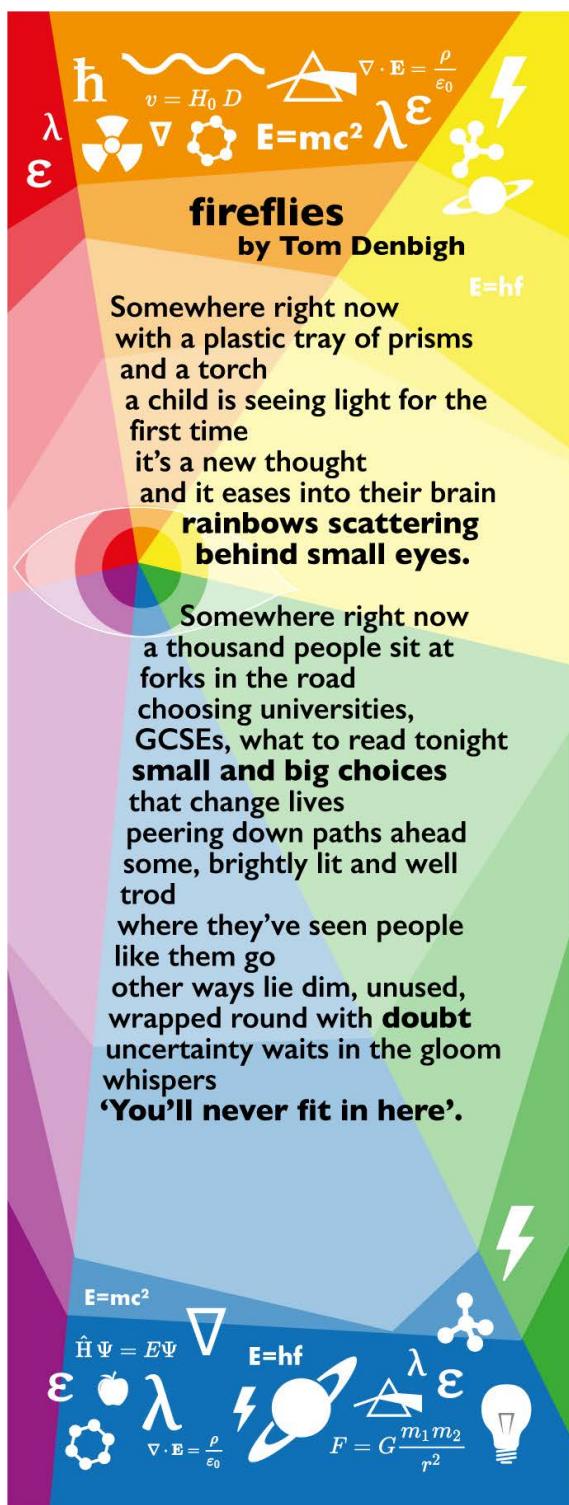
Alex emphasised how assessing impact is very important for the IOP; he gave an interesting example: when the IOP got involved to try and increase the number of physics teachers, they set a recruitment target of 925 new physics teachers per year. That target was missed, unfortunately, but since the IOP became involved, the number of physics teachers has increased from 200 to 800 new recruits a year, which is a great achievement. So this intervention could naively be deemed a failure due to having missed the target, while its impact has in fact been fantastically beneficial, and a true appreciation of that should be made and the intervention seen as very positive. The main challenges to measuring impact are the identification of causal relationships, the interpretation of subjective gains and the fact that change can often be slow and incremental.

Amanda Diez Fernandez from *Imperial College London*, reported on her experience working at the Parliamentary Office of Science and Technology (POST). POST, made up of 8 fellows and 8 scientific advisers, is Parliament's in-house source of independent, balanced and accessible analysis of public policy issues related to science and technology (www.parliament.uk/post). Briefings commissioned on specific topics are periodically published as POSTnotes and publicly available online.

Amanda outlined the process of preparing a POSTnote, including a drafting stage and two re-drafting stages, following internal and external review, prior to approval/publication and presentation at a Board Members' meeting to 14 MPs, 10 from the House of Commons and 4 from the House of Lords. Amanda then focussed on the specific topic she worked on, quantum technologies, an industry sector with a predicted future impact for the UK economy of £1bn and for which the UK Government has devised a National Programme of development. With this brief being relevant especially to the all-party Parliamentary Group on photonics, quantum technologies promise to revolutionise secure data transfer and telecommunication via new encryption methods, safe transportation and global positioning, and the health and environment sectors. Amanda described the very specific layout POSTnote briefing documents must have, and the contents that need to be specifically addressed in order to inform Parliamentarians (non-experts) with maximum efficiency and clarity of communication. The extremely concise document (consisting of just 5 pages) must in fact introduce the background science underpinning the technologies (in this case, concepts such as wave-particle duality, superposition and entanglement), what makes these novel, different from and better than current technologies, and the impact they will have, including likely timescales for this impact. The document must also present selected examples of applications, including existing research efforts and achievements to date, examples chosen for the final POSTnote being the Canadian company D-wave in the development of quantum computers, and international consortia developing quantum encryption. The various approaches to achieving quantum computation, for example, had to be comparatively presented, including superconducting loops, silicon quantum dots, trapped ions, diamond vacancies and topological qubits. Amanda summarised the challenges of completing the Quantum Technologies POSTnote by saying that the document needed to be comprehensive but concise, formal but accessible. A copy of the completed Quantum Technologies POSTnote, along with POSTnotes on many other topics, can be found on the Parliament POSTnote website here: <http://www.parliament.uk/postnotes>.



Amanda Diez Fernandez, Imperial College London,



In the last newsletter, we published Joby's cracking [LGBT allies poster](#). Here is a wonderful poem written for us by [@UnrootedTom](#). For copies of the bookmark, or poster, please e-mail: jessica.wade@imperial.ac.uk

Did you know that there is an LGBT+ physicists and astronomers network? Register here <https://goo.gl/43bMRM> to keep updated.



DRESSING FOR THE MOON: HOW TO DESIGN A SPACESUIT

8-9 Sep 2017 10:30 - 11:10 Cosmos Theatre • [Cosmos Theatre](#)



Speakers
Vinita Marwaha Madill, Space operations engineer - European Space Agency

Vinita is an advocate for STEM outreach, founding the platform [Rocket Women](#) that aims to inspire young women to study STEM. Vinita Marwaha Madill will be speaking at [New Scientist Live 2017](#) in London on **Friday 29th September!** During her talk '**Dressing For The Moon: How To Design A Spacesuit**' she'll be discussing how to design a spacesuit for the Moon and the exciting projects being planned by space agencies globally to return astronauts to the Moon. Tickets are available, with a **10% discount** offered to newsletter readers to attend this exciting event, using the code '**SPEAKER10!**' To book tickets for *Dressing For The Moon: How To Design A Spacesuit* visit: <https://live.newscientist.com/talks/dressing-for-the-moon>

Catching up with a Rocket Woman, [@Rocket_Woman1](#)

Vinita Marwaha Madill is based at the European Space Agency (ESA) as a Space Operations Engineer where she is focused on future human spaceflight operations. Vinita has previously worked at the German Aerospace Centre (DLR) to guide astronauts through experiments onboard the International Space Station (ISS). At ESA's European Astronaut Centre, Vinita helped design the SkinSuit and conducted a study on future spacesuit design. Vinita studied Mathematics and Physics with Astrophysics at King's College London and went on to gain master's degrees in Space Management from the International Space University (ISU) and in Astronautics and Space Engineering.

The Women in Physics Group Jocelyn Bell Burnell Award Event: 11 October 2017

The Women in Physics Group will be holding its annual award event for the Jocelyn Bell Burnell Medal and Prize for 2017. The award is given to an outstanding very early career female physicist who has made a substantial contribution to the subject and has undertaken activities to support and encourage others in the field. At this event, the finalists selected for this prize, the 2017 Jocelyn Bell Burnell Medal and Prize, will each give a short presentation about their work, suitable for a non-specialist audience, before the overall winner is announced. School groups (age 14+), and college and university students, are particularly welcome. This winner will then attend the IOP Awards Dinner in November where they will formally be presented with their medal and prize. The lecture is free, tea and coffee will be served at 3pm for a 3.30pm start. The event will end at 5pm. [Register and read more here.](#)

The Early Career Physics Communicator Award

2017

The IOP Physics Communicators Group invites applications from people at the start of their careers in physics who have undertaken activities that support and encourage excellent communication of physics. The Early Career Physics Communicator Award is awarded annually and to be eligible applicants do not need to be a member of the IOP but must be resident in the UK or Eire and either within five years of a first degree in physics (Bachelor's or Master's) or currently engaged in postgraduate study in physics. **The deadline for applications is 2 October 2017.**

Shortlisted applicants will give a presentation demonstrating their physics communication methods at a special event on **24 November 2017**. The winner will receive £250 and a certificate from our guest judge and speaker at the event, [Helen Czerski](#).

For more details on how to apply and to download an application form please visit the [prize website](#).

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This newsletter is also available on the web and in larger print sizes.

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