IOP | Institute of Physics
Physics Communicators Group

Still taken from the film *The Visit: An Alien Encounter*, a documentary style film with a scientific basis.

Physics and Film

by Sam Illingworth

On the 21st June, the Physics Communicators Group will be hosting its annual summer seminar at the Institute of Physics in London, and this year's theme is Physics and Film.

We will be joined by a number of guests who work with physics and film in a variety of different roles, from Steve Crabtree the editor of the BBC's flagship science programme 'Horizon' to Dr David Kirby, Senior Lecturer in Science Communication Studies at The University of Manchester, and author of the book 'Lab Coats in Hollywood.'

The summer seminar is a great way to come and listen to some fascinating people talk about the different ways in which physics is used in the world around us. It is also a fantastic opportunity to meet fellow IOP members, and a good networking opportunity; there are also free

refreshments! It will be in the afternoon (expected 1pm to 5pm) on Tuesday 21 June, so get it in your diaries.

In addition to the summer seminar, the Physics Communicators Group is proud to announce that it is partnering with the educational charity Into Film, to deliver a special event on Monday 4 July in Manchester, as part of its European City of Science celebrations. There will be a special screening of the 2015 science fiction blockbuster The Martian, followed by a Q & A with scientific experts.

This event will be a free event for 100 local school children in the Manchester region, and will be recoded for The Neutrinos Are Mutating, a science and film podcast that investigates the science fact behind the science fiction. The episode will be available from the beginning of August, so look out for it in a future edition of the newsletter.

Early Career Physics Communicator Award Finalists

In the last issue we featured articles from two of the four finalists of the 2015 Early Career Physics Communicator Award. Below, two of the finalists explain how they communicate physics to a variety of audiences.

Information on the 2016 award will be announced in the next newsletter.

Rebecca Douglas

Rebecca Douglas, PhD student working on gravitational waves at the University of Glasgow

Everyone loves a good science festival. The energy and momentum of everyone running so many exciting events all in one place can be really inspiring and exciting. So many people can be reached so quickly and so much knowledge can be shared.

However, like it or not, there will always be a few people who don't want to go to these events. They don't see themselves as science fans. Even if they engage with culture more generally (and yes, I do think that science counts as a part of our culture) they're not interested in public physics lectures, or star gazing events, or fun experiments and demonstrations. These are the people who, when I tell them I'm a physicist, react with shock and say things like "oh no, I hated physics at school."

Given that some of their taxes go towards funding so much physics research, it doesn't seem fair to leave them behind. We don't want to leave them with the false belief that the entire field is about dusty equations on a chalk board that don't seem to relate to real life. So how can we reach them?

In my experience the secret lies in working with a greater variety of

people when you plan your events. I've had fantastic results by working with theatre groups, for example. Or by planning an outdoors, public, science busking event and allowing people's curiosity to bring them to us. That way there's no need for your audience to intend to learn about physics for them to engage with it anyway.

Often this means running lots of very different events (not to mention working outside of your comfort zone), but the benefits are very clear. Once you do manage to engage with new groups of people, you'll find you learn as much from them as they do from you.

Rebecca Smethurst

Rebecca Smethurst, PhD student in astrophysics at the University of Oxford

As a PhD student, working in the Zooniverse is like Christmas come early. The Zooniverse is a citizen science project platform, which engages over a million people worldwide with classifications of real scientific data, including particles in the ATLAS detector, craters on the Moon, and even penguin populations. It is a plethora of exciting and engaging science, which keeps me motivated in my own work: using the Galaxy Zoo classifications to study how the shape of a galaxy reveals its evolutionary history. Once I have these classifications, another useful bit of information is a galaxy's distance, i.e. its redshift, a principle I recently explained in my audience winning UK National FameLab piece, using a bluetooth speaker with sound to demonstrate the Doppler shift.

One of the main benefits of the Zooniverse is the platform it creates for engagement - one that is often exploited in the annual BBC Stargazing Live programme. In 2015, as well as crowd sourcing the classifications of astronomical images, I led a project to crowd source the images themselves. On the TV programme, viewers were asked to take images of the constellation of Orion with whatever photographic equipment they had available, be it a SLR camera or a smart phone, and then send them in. I then used the typical astronomer's technique of calculating the positions of each image and stacking them together to create a deeper image than any single person could take. This method was explained to viewers online with a BBC iWonder video on which I consulted. Over 1000 images were sent in over the 3 days that the programme aired and the result was one of the most beautiful images of one of the most well known areas of the sky. Now we know that this is possible, in the future I hope to do this on a global scale across the entire night sky.

Q & A with Dianna Cowern (Physics Girl)

Dianna Cowern, creator of popular YouTube channel, Physics Girl.

What is your job?

I am a science educator who runs the YouTube channel Physics Girl with PBS Digital Studios.

What does this involve (in ten words or less)?

Everything from filming and research to hosting and editing videos.

What is your physics background?

I became obsessed with learning about the world starting at the age of 3. That, and I received a BS (equivalent to a BSc) in physics from MIT.

What is your proudest physics-related achievement to date?

I won the Flame Challenge to explain “what is colour” in a science video to 5th graders. The video was judged by 5th graders, so it really challenged my ability to break down physics topics to a lay audience.

How important do you think outreach and public engagement are in your role?

Outreach and engagement are the definition of my role. As soon as the videos stop being engaging, I will no longer have a role.

What is the biggest challenge that physicists face in communicating their subject?

Physicists use a lot of jargon in their day-to-day jobs and are often in very specific fields of research. It’s hard to take a step back to before they knew all that jargon and remember how to explain things in common terms.

Do you have advice for any physicists wanting to get more involved in outreach and public engagement?

Practice! Engaging the public with science only gets easier with practice. Find something that works for you, whether it’s online, a blog, volunteering at your institution’s outreach events, or public talks. There are many different options.

Which social media platform do you find to be the most effective for communicating physics, and why?

I spend the most time making YouTube videos, but Twitter can be great for conversations and connecting with other scientists and engineers. And the comments are generally more personal and friendly on Twitter.

Where can people find out more about your work?

They can check out the channel at youtube.com/physicsgirl. I have new videos most weeks.

Who is your favourite physicist (living or dead), and why?

I am rather partial to Marie Curie due to her impressive contributions to both physics and chemistry.

The Visit: An Alien Encounter

by **Martin Dominik**

On Monday 4 April, as part of the Edinburgh International Science Festival, the Royal Society hosted a special screening of The Visit: An Alien Encounter, followed by a discussion session with the film director Michael Madsen, and myself, who acted as scientific adviser for the film.

While this film depicts an event that has never taken place (to our knowledge, we have not been visited by intelligent alien life), all of the characters that appear in the movie are real; an excellent collection of experts on a wide range of topics are being confronted with the scenario, and their statements have not been scripted in advance. Deliberately, no speculations are undertaken about how alien life might look, instead it is the viewer who assumes the position of the alien visitor. *The Visit* had its premiere at the Sundance Film Festival in Utah in January 2015, exactly 5 years after I had organised a Royal Society Scientific Discussion Meeting on 'The detection of extra-terrestrial life and the consequences for science and society'.

Michael and I both wondered about how humanity would approach the discovery of life beyond Earth, for which we are not prepared. The most revealing insight was how little we know about ourselves. The film acts like a mirror. It does not provide us with direct and concrete answers. Instead, it makes us think about who we really are, and makes a great experience, eminently because of Michael's portrayal of inquiry.

What's On

- Natural History Museum: Otherworlds exhibition 22 January - 15 May
- Physics Communicators Group event: Physics in Film 21 June
- BSA Masterclass: Science communication primer 15 June
- The Royal Society Summer Science Exhibition 4 July – 10 July
- MOSI: Evaporation exhibition until 15 May
- Royal Observatory Greenwich: Insight Astronomy Photographer of the Year until 26 July
- National Maritime Museum: Above and Beyond exhibition 27 May – 29 August
- Royal Court Theatre: X 30 March – 7 May

Creative Physics Communication

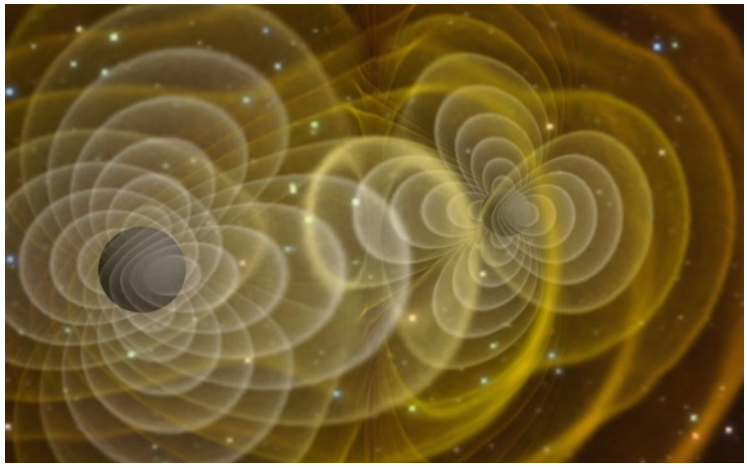
This section of the newsletter is dedicated to celebrating the creativity in physics communication.

In this edition we bring you a science poem from Sam Illingworth about the detection of gravitational waves, entitled 'Our Universe Beats Like a Heart'.

LIGO has found waves without light,
In finding them Einstein was right;
General laws of his were smart,
Our Universe beats like a heart.

Looking for two black holes to crash,
In faith they searched for the backlash;
Glory to those who played their part,
Our Universe beats like a heart.

Lasers at right angles were placed,
In hopes the ripples could be traced;
Great pebbles in the cosmic chart,
Our Universe beats like a heart.



A three-dimensional simulation of merging black holes (Photo Credit: Henze, NASA).

L-shaped they lay across the ground;
In search of some strange chirping sound,
Gigantic bodies torn apart,
Our Universe beats like a heart.

Leached from the death of distant stars,
Implied by Hulse-Taylor's pulsars;
Gone are the doubts, we can impart:
Our Universe beats like a heart.

Light could not prove the paradigm,
It can not pierce the start of time;
Gravity can reveal the start,
Our Universe beats like a heart.

This is an Acrostic Kyrielle, based on the ground-breaking piece of research which detected gravitational waves, at the Laser Interferometer Gravitational-Wave Observatory (LIGO) in Livingston, Louisiana and the other in Hanford, Washington. You can read more of Sam's work on his blog.

If you have anything creative that you would like to share, then please get in touch!

Contact us

Interact with the group through the group webpage or through Twitter @IOPPhysComm.

If you would like to include something in future editions of this newsletter, please contact committee members, Dr Sam Illingworth (S.Illingworth@mmu.ac.uk) or Steven Simpson (Steven.Simpson@royalsociety.org).

To give feedback comments or suggestions for the group in general, please contact the group secretary, Chris Sinclair (Christopher.Sinclair@ucl.ac.uk) or message through MyIOP.

To join the group, please log onto MyIOP to become a group member. Joining the group is free, but you do need to be a member of the IOP.

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

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