



JANE MACARTHUR, UNIVERSITY OF LEICESTER, EMMA OSBOURNE, UNIVERSITY OF SOUTHAMPTON, JASMIN EVANS, LOCKHEED MARTIN UK AMPHILL AND CHICO CAMARGO, UNIVERSITY OF OXFORD. MEMBERS OF THE AUDIENCE DISCUSS THE PRESENTATIONS.

JASMIN EVANS WINS THE GROUP PRIZE

University of Central Lancashire graduate **Jasmin Evans** has won the Early Career Physics Communicator Award. At our annual event, guest judge, physicist and broadcaster Dr Helen Czerski, delivered a passionate address on “the voices of science: *what should we say, who should be heard, and who do the public listen to?*”. Jasmin graduated with a BSc in physics from the University of Central Lancashire, and currently works at Lockheed Martin UK Ampt Hill. We caught up with Jasmin and two of the finalists.

A TIME FOR CHANGE, JASMIN EVANS @THEQUIRKYQUARK

As physics communicators, we rely on the senses more than you may think. How do we attract people to our stands and exhibits at shows? How do we explain complex technical concepts to those unfamiliar with the terminology and subject matter? We count on visual aids an incredible amount, to amaze our audience and explain science.

According to the RNIB, over two million people in the UK are living with sight loss, and that number is rising. Included in this figure is five in every ten thousand children up to the age of 16 that have severely impaired sight, or blindness. That is over 21,000 children, automatically excluded from our outreach efforts and dissuaded from pursuing a career in STEM solely through the displays we put up.

The Touching Space Project aims to tackle this head on by delivering workshops in space science and astronomy specifically for people with visual impairments. Through the use of tactile and audio aids, and enhanced visual, we strive to make the universe come to life for people who have never been able to experience it before in an environment that is completely open for them to be themselves and ask as many questions as possible.

Through previous work with Galloway’s Society for the Blind, and



Jasmin Evans delivers her winning presentation at the annual award ceremony, November 2017.

“YOU TRULY ARE HELPING TO MAKE A MORE INCLUSIVE AND DIVERSE COMMUNITY, AND REALLY COULD CHANGE A LIFE. PASS IT ON.”

Action For Blind People (Part of RNIB) we are looking to reach out to more and more children over the coming years, to spread the message that there is a place for them in STEM careers and perhaps more importantly - that they are wanted in those roles.

As well as being more conscious in the way we approach our outreach and science communication activities, there is also an attitude for us to address - inclusivity and diversity. As a woman in STEM, I can tell you we have a very long way to go before we have anything close to gender balance, and at the moment a mere 6% of those employed as professional engineers are people from ethnic minorities (RAEng). This is where the magic of outreach can do wonders for the world of science. By taking that extra ten minutes in your planning to think ‘how would someone with a visual impairment interact with this?’, or ‘how would both

boys and girls perceive this stand?’ and most importantly...‘how can I have an impact? How can I make a difference?’ you truly are helping to make a more inclusive and diverse community, and really could change a life. **Pass it on.**



IT'S CHICO TIME! @EVOLUCHICO

Chico Camargo, of the Rudolf Peierls Centre for Theoretical Physics has won an Early Career Researcher award in this year's Vice-Chancellor's Public Engagement with Research Awards, which celebrate public engagement work across the University of Oxford. Chico won his award for his work on YouTube creating videos about complex systems concepts. Since June 2016, Mr Camargo has been part of a Portuguese-speaking YouTube scientific outreach channel called BláBláLogia, with daily videos on topics from space travel to ecology. He

aims not only to focus on research but also to inspire people in the ways that we study such phenomena and increase understanding of the world around us. He is the host and writer of a fortnightly show, Top Models, where he engages people with the mathematical models used in science, and how they connect the natural and the social sciences. He has produced over twenty films to date to a mostly young adult (18-30 years old) audience in Brazil.

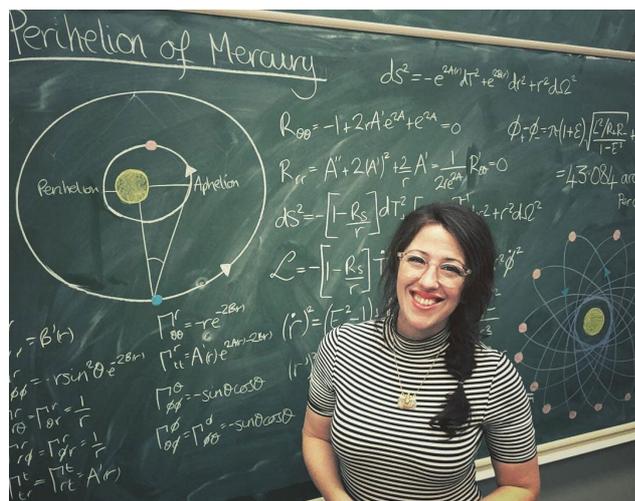
Today, BláBláLogia has almost 100,000 subscribers, and over 5 million views, with some videos reaching tens of thousands of views. The channel won the 2016 YouTube 'NextUp' prize, awarded to the most promising channels with under 100k subscribers.

The public engagement work has fed back into his research, as having to explain elaborate concepts in a more fundamental way, without relying on university-level mathematics, has led to a more thorough understanding of the tools he uses every day. Members of BláBláLogia have also been invited to many seminars, debates and panels as a result, helping to raise their research profile.

THE EXTRAORDINARY UNIVERSE, @EMMANIGMA

Emma is a third year PhD student at the University of Southampton and member of the LIGO Scientific collaboration, her research is on how neutron stars make gravitational waves by growing mountains.

Emma is very active in science communication. Her YouTube channel, The Extraordinary Universe, conveys concepts from Einstein's Theory of Relativity in under two minutes to an audience of 14 and above, pairing animation with easy to understand information. Emma gives talks across the UK in pubs, cafes, science museums and science festivals, whilst on social media



Emma is challenging stereotypes by sharing her journey as an astrophysicist, to help inspire more women to study STEM subjects. Emma has been interviewed about the recent gravitational wave detections on podcasts, radio and television. Her television appearances include BBC's Tomorrow's World. Emma told us she 'loves the challenge of conveying complex topics to non-specialist audiences' and this passion comes through in her work.

WHAT'S SO FUNNY: COMMUNICATING PHYSICS WITH COMEDY, @ULTRAJESSAMYN

The 2017 Mary Somerville Medal and Prize was won by Dr Jessamyn Fairfield of the National University of Ireland Galway, for stellar work as a speaker and writer on physics for a popular audience, and for having organised and hosted many innovative events bringing physics to the Irish public. You can read [her citation here](#). Jessamyn's blog can [be found here](#). The award is made for exceptional early career contributions to public engagement within physics, and is accompanied by a prize of £1,000: nominations are open for 2018: [click here](#).

It's Sunday, and the Higgs Boson has had a terrible morning. Burnt the toast, tripped on the way out the door, missed the bus. Finally it arrives at the cathedral, but the usher bars the door and says, "Sorry, you can't come in, you're late."

The Higgs Boson, exasperated, says, "But without me, how can you have mass?!"



The author at Bright Club Galway in April 2017. Photo courtesy Steve Cross.

The discovery of the Higgs boson at the Large Hadron Collider was a major news story in 2013, covered not just on science news outlets but everywhere. Particle physics is notoriously arcane, yet the above joke clearly explains why it matters: the Higgs boson is the particle that gives other particles mass. Even your friend whose eyes glaze over as you try to explain field theory will remember the image of the Higgs boson trying to go to mass. Comedy provides a novel way to talk about physics: it's memorable, full of surprises, and relatable.

But there are actually lots of parallels between comedy and science. Both require you to think outside the box, to adopt new frames of reference, to upend the status quo. When you are listening to a joke, you're waiting for the script to flip—you're waiting to change your mind. This makes comedy the perfect vehicle for talking about scientific

research, where we are often forced to change how we think about things in response to new data. Finding the funny in your work can also lead to good storytelling, being concise, and lots of other features of good science communication in general.

Here in Ireland, I provide opportunities for academics to make jokes about their work. I have been the director of Bright Club Ireland for the last three years, training academics to be funny and then compering Bright Club events where they try out their material in front of a live audience. The speakers aren't just physicists, but hail from every academic discipline from bioengineering to psychology to medieval literature. When I ask people to perform at Bright Club, they often tell me that their work is very serious... of course it is! But it's also full of surprises, and highlighting those can not only tell the public about your work but even give you a new angle on it.

One of the most effective ways to teach a subject and empower students is asking them to not just regurgitate material, but remix it and create something new. So perhaps we should all be asking our students to write jokes about physics... or writing a few jokes ourselves!

MOBILE ROAD MASTS: ARE THEY DANGEROUS? DR JOHN BRUNN

This is a question that is often asked, and is of topical interest given our increasing use of mobile technology. The IOP was approached back in October by Stevie Bain (The Naked Scientists - a BBC radio programme) to provide an answer to this listener's question:



“Our new house is 140 m from a cell phone tower. As a family, the three of us feel like we have been affected to different degrees in terms of sleep, motivation and anxiety, which are commonly reported symptoms of exposure to microwave radiation. It's a controversial topic but are there any major health risks living close to a phone tower?”

We discussed this in the IOP and following some checks of the facts I provided the IOP answer below (based on current evidence available from Public Health England) through our Physics Communicators Group. I'm a theorist and did my PhD research on the

electromagnetic properties of conducting systems, and now look at wave dynamics in climate systems so have familiarity with the physical principles of the topic. In the end this piece was not communicated by the BBC, however in the IOP we thought it was of intrinsic value and so are sharing this communication piece internally for information and discussion (please do feedback if you have any additional thoughts).

Answer script start: We are all very aware of our ever increasing dependence on mobiles and their related communication masts. The question from the listener is: are they safe, e.g. at 140 m?

For England the health guidelines are clearly stated by Public Health England. These provide our answer to the question: <https://www.gov.uk/government/publications/mobile-phone-base-stations-radio-waves-and-health>

In short, public exposure levels are protected by regulation so we don't get hurt. The general public is ok.

There are some very close proximity risks: in some cases where base stations have a large power density (above safe absorption levels) in its surrounding 10 to 50 m then exclusion zones are used to prevent people going into these areas.

Ofcom and CRCE (Public Health England Centre for Radiation, Chemical and Environmental Hazards) have made measurements and find that exposure at publically-accessible locations near to base stations is very much below the ICNIRP (International Commission on Non-Ionizing Radiation Protection) guidelines.

So the answer is no: there are no major health risks living close to a phone tower. If it helps your family, have a chat with your local planning office to confirm that the planning guidelines have been followed.

EXPERIMENTAL WORDS

Biology meets balladry as leading scientists are paired with incredible spoken-word artists to collaborate on a new performance, celebrating the creative similarities between science and the performing arts. The result? A diverse display of rhyme, rhythm and reason. [A project from Dr. Illingworth and Mr. Simpson.](#)

“I THINK I MIGHT HAVE JUST SHARED SOMETHING INCREDIBLY PERSONAL WITH A ROOM FULL OF STRANGERS” POET SARA HIRSCH

Dr Sam Illingworth is a scientist, and a Senior Lecturer in Science Communication at Manchester Metropolitan University. Dan Simpson is a poet, performer and producer. Together they are *Dr. Illingworth & Mr. Simpson*, working to produce spoken word projects that combine cutting-edge research and spoken word.

Experimental Words has previously happened in Edinburgh, and is currently running in Manchester, London, and Canterbury, and is funded by Arts Council England.

Hear more on the podcast “[Scientists not the Science](#)”, hosted by Dr Stuart Higgins, where he documents taking part in one of those



events, and talks to Dan and Sam about their motivation for the project. He also talks to some of the poets and scientists taking part in the event.

Episode One: [click here](#)

Episode Two: [click here](#)

HOW TO RECORD, EDIT AND PUBLISH A SHORT AUDIO INTERVIEW @STUARTGHIGGINS



This guide covers the approach I developed while producing a series of short audio interviews with for the group [Cavendish inspiring Women](#) (CiW) at the University of Cambridge. They are a student-led group that promote the visibility of women working in science. The guide is intended to help those with limited experience working with audio to record, edit and publish a short interview like the one below.

PART ONE: PREPARATION

What's the point? The first step is to develop a clear idea of the purpose of the interview, book an appropriate guest and research their background. Ask yourself:

- Why are you interviewing this person?
- Why are they interesting to your audience? (Do you know who your audience is?)

The *CiW interviews* (and similarly those for [Scientists not the Science](#)) I conducted were predominantly with scientists who had little or no experience of being interviewed. However most had plenty online about their research and background, and I made sure to read up as much as I could beforehand.

Questions to ask Because of the highly structured and short nature of the *CiW interviews* I also drafted a list of questions to ask, along the lines of:

1. Please describe your name and background
2. How do you describe your research in one sentence?
3. When did you start calling yourself a scientist?
4. How is your research going to save the world? (deliberately provocative and used sparingly when a good rapport has already been established!)
5. What's been the most exciting thing you've ever done in science?

I had these on to hand as a checklist, but didn't just read them out - this can come across as stifled in the recording. I tended to modify their tone and language during the interview depending on the context and how the interview is going.

Having a plan helps me focus on what I want to achieve with an interview, and also makes sure I don't miss any obvious audio I wanted to record - for example the interviewee introducing themselves. For the longer *Scientists not the Science* interviews my plan tends to include themes I want to talk about, rather than specific questions. Ultimately I'm having a conversation and want it to be as natural as possible, while at same time slowly steering it in a particular direction - this is tricky and I'm still practicing.

[You can find out more here.](#)



heard about it, I thought I really don't want to do that. I don't want to expose myself. I have worked very hard to get where I am, thank you. I don't want to throw it away in a pub. Then one of my male colleagues said to me that he'd done it and he was really good, and I thought, you haven't even asked me, you swine. Next thing, I was in a pub in central London thinking, what have I done? But it was very interesting. Obviously, it was a great kick when people laughed, but my main thought when I came off is that I want to do that again. I think that it's made me a more confident speaker.

PEOPLE WE LOVE: ALEX LATHBRIDGE @THERMOFLYDYNAMICS

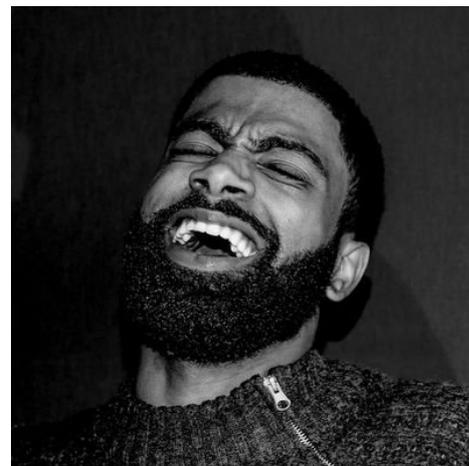
Alex Lathbridge is a peptide biochemist and computational biologist studying for a [PhD](#) in novel peptide therapeutics at the University of Bath.

In 2014, he graduated with a First Class Honours degree in Biochemistry, with a research focus on molecular modelling of protein-protein interactions in migraine pathways. He's been described as the UK's "best scientist turned rapper". He mixes science, comedy and hip-hop on his [YouTube channel](#).

Alex is a keen science communicator and regularly performs stand-up at [Science Showoff](#) and other events across the country, including [Green Man Festival](#), [Blue Dot](#) and [Cheltenham Science Festival](#).

He hosts geek comedy night "[Large Stand-Up Collider](#)" at the [Science Museum Lates](#), and was the 2017 winner of [FameLab](#). He is also a member of the [Science Showoff Talent Factory](#), supporting and mentoring future science communicators, as well as developing his own performance.

He champions [diversity in STEM](#) and, earlier this year, hosted two sell out Science Showoff events with fully BAME lineups. He has now founded [Minorities In STEM](#) - the UK's first network for BAME/ethnic minority people studying, working and affiliated with STEM.



TV WE LOVE: EXPEDITION VOLCANO

Nyiragongo in the Democratic Republic of Congo is one of the world's most active volcanos, with a hypnotically beautiful lake of molten lava churning in its crater. It has erupted several times in the past century: in 2002 the nearby city of Goma was swamped by lava draining from the lake at speeds of up to 40kph, leaving 200,000 people homeless. The local population need to know if another eruption is likely, which needs research and constant monitoring in a politically volatile area.

BBC 2's Expedition Volcano followed a scientific team as they assess the current state of the volcano, which involves some scary abseiling into its crater. The team were Prof. Chris Jackson, Dr. Xand Van Tulleken and Aldo Kane. Prof. Chris Jackson was a guest on the Christmas edition of Science Weekly, the science podcast for kids with Dan exploring the weirdest and coolest stuff in science! [You can catch up with Chirs and Dan here.](#)



WE NEED CONTENT!

This newsletter is circulated to all members of the IOP Physics Communicators Group, school students, teachers, scientists and communicators. If you want to advertise a new opportunity, find help on a new idea or show off about something awesome you've done, PLEASE GET IN TOUCH: jessica.wade@imperial.ac.uk.

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