

## Book of Abstracts

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## A Feat of Clay: Palaeontology Engagement through Art

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Palaeontology is possibly the most effective tool to engage publics with the earth sciences. However, the audiences reached by palaeontological engagement are often limited to recurring groups, such as families with young children and adults with a pre-held interest in the sciences. Here, we have taken a novel approach to broadening the audiences reached by palaeontological engagement through collaboration with the arts. University College Dublin seed funding has enabled a pilot workshop to be developed and run alongside UCD Parity Artist in Residence Elaine Harrington. In the workshop, participants were introduced to a range of fossils and the geoscience involved in producing clay for ceramics. They were then encouraged to create a fossil-inspired artwork from the provided clays. Participants actively engaged with and were inspired by the palaeontological material. The 2.5-hour workshop was held on a Saturday afternoon at a community centre in rural western Ireland with low levels of scientific engagement. Attendees (25 people) were predominantly females between the ages of 30 and 60, which suggests the workshop was successful in broadening engaged audiences. We intend to build on this success in future events and expand the project by creating transportable ceramic models. Suggestions for future workshops are welcomed.



## Cell Explorers\_STEM Engagement In Schools Delivered By Higher Education Institutions

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**Cell EXPLORERS is an educational outreach programme** that aims to inform, inspire, and involve young people in science. Based on the activities of a volunteering team made of students and staff from higher education institutions (HEIs), the programme brings excitement of science to the public, increases public engagement with “Science Technology Engineering and Maths (STEM)” and highlights its importance in society.

Cell EXPLORERS uses a unique model for sustainable science public engagement in HEIs, originally developed in NUI Galway. It engages students in educational outreach activities as part of their curriculum and also works with a growing volunteering base made of students and researchers. This organisation underpins the model's sustainability and has the dual benefits of engaging children, young people and the public in STEM whilst developing key graduate student attributes and researchers' public engagement skills.

In 2019, the programme has 13 teams established in HEIs nationally, including the original NUI Galway team. An important aim of the programme is to combat the stereotypes associated with science (e.g. science is boring and difficult) – and scientists (e.g. scientists are typically old white, mad men wearing glasses, facial hair and a lab coat). The team of volunteers brings a positive engaging science experience and information on science careers to children at an age where they make decisions about their interest in STEM or make their choice of STEM as a career. During these activities, participants impersonate scientists and are mentored by local scientists, facilitating real-life science experiences and one-to-one interactions with science role models.

The structure and organisation of the programme, its characteristics and findings on its impact will be presented. In particular, current evaluation of the programme highlights self-reported benefits of participation by team members as well as positive impacts on children's perceptions of science and scientists.



## CREATE: The Art of Pregnancy, Birth & Beyond



### CREATE

THE ART OF PREGNANCY, BIRTH & BEYOND



*Elise Belmonte*

*CREATE-The Art of Pregnancy, Birth and Beyond* was a free art exhibition that showcased common pregnancy and new-born health issues and celebrated the impact of perinatal research on mothers and babies in Ireland and internationally. The project aimed to engage an audience of public, patients, healthcare professionals and researchers to create an exhibition with a diverse field of voices, experiences, topics and artistic media. This exciting and novel format was chosen because at the heart of both art and research is curiosity. Research and art allow us to ask questions and to find answers. What better medium to explore and celebrate perinatal research?

*CREATE* received over 80 submissions during the Open Call. 13 pieces were chosen, touching on topics ranging from perinatal mental health to bereavement and pregnancy loss, IVF, labour, birth experiences, and breastfeeding, as well as exploring how health research helps women and newborns.

The exhibition was showcased in 4 unique spaces – a mix of cultural and gallery spaces, and clinical and research environments. After the initial exhibition in Science Gallery, which hosted around 3,000 visitors over two weeks in July 2018, the exhibition moved to the Rotunda Hospital during Culture Night and, the following year, the project toured to venues nationwide including St.Peter's in Cork, University Hospital Galway and NUIG campus. The exhibition welcomed over 14,000 visitors in ten months.

The growth of this project indicates the valuable role that art and communication have to play in the dissemination of health research and knowledge to the public.

This project is an initiative of the HRB Mother and Baby Clinical Trials Network and the Rotunda RCSI Research department and was funded by the Health Research Board through its Knowledge Exchange Dissemination Programme.



Debunking the Myths-The science behind women's health



# Debunking The Myths

## The Science Behind Women's Health

*Aine O'Flaherty*

"Debunking the Myths-The Science behind women's health" is a workshop series for teenagers focused on women's health. In today's climate of 'fake news' it can be difficult for teenagers to find reliable sources of information about sexual and reproductive health. Many teenagers are learning about their bodies and these health issues from film, television and social media.

We hosted four workshops in the Rotunda Hospital, each for 50 secondary school students from the community, to discuss and debunk a number of myths associated with women's health. We targeted secondary schools in the Dublin area, with a particular focus on schools in the Rotunda catchment area. The topics that were covered were those of particular relevance to students in the 15-18 year old bracket, important topics such as Periods, the Vagina, the HPV vaccine and Contraception.

The aim of these workshops was to examine the actual science of women's health. The workshops also offered a safe space for teenagers to ask qualified professionals about topics related to sexual health. They provided a forum for young people in the community to explore the science behind women's health. It is increasingly important to educate our young people about the advancements in health research and to make them aware of the various preventative and screening measures such as the HPV vaccine, and the CervicalCheck programme which continue to be developed. By informing young people about what is healthy according to proven scientific research we are giving them the tools to make informed decisions about their health and wellbeing.

This project is an initiative of the HRB Mother and Baby Clinical Trials Network and the Rotunda RCSI Research department and was funded by the HRB through its knowledge exchange dissemination programme.



## Diving into Art, Science, Technology & Knowledge: Catching A Wave

Hester Whyte<sup>1</sup> and Aoife Deane<sup>1</sup> in collaboration with the *Catching a Wave Collective*<sup>2</sup>

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Communicating science to engage stakeholders and generate change remains one of the biggest challenges of our time. In a world of constantly shifting biophysical and social realities, we face an ever-evolving need for new ideas around sustainable development. *Catching a Wave* represents a collective of multi and transdisciplinary researchers from six universities based in the USA, UK and Ireland, combining expertise in environmental, social sciences and the arts.

*Catching a Wave* is planned as an iterative sea-level rise multi-media installation to act as a catalyst for a transdisciplinary approach to shift individual and collective mind-sets towards action on sea level rise and consideration for the people who live, work and interact within at risk coastal spaces.

Each wave “subject” is captured in detail through being photographed from multiple angles, capturing as many of surfaces as possible. The resulting digital output is then printed to create 3D models which are then used as patterns for glass moulds. Images and text relating to ocean health are embedded by fusing them into the glass waves so they are still readable through the polished sides of the wave.

Using a transdisciplinary approach to overcome barriers in language, discipline specific jargon and siloed thinking, the project team are exploring ways of integrating voices of coastal and island peoples and communities who are often marginalized. The philosophy and nature of the *Catching A Wave* project in its many and varied forms has the liberty and potential to generate shifts in social perceptions in ways that science and data alone currently do not.

This initiative is part of a movement to reinvigorate linkages between the arts and sciences in order to address urgent issues of our time under the auspices of the Sustainable Development Goals.

**Key words:** Coastal and Ocean Sustainability, Communication, Art, Science & Technology Integration, Transdisciplinarity

<sup>2</sup>**Catching A Wave collective:** Shona Paterson (Global Challenges Research Fellow, Brunel University, UK), Martin Le Tissier (UCC, Ireland), Hester Whyte (UCC, Ireland), Lisa Beth Robinson (East Carolina University, USA), Kristin Thielking University of Wisconsin, Stevens Point, USA) and Mrill Ingram (Independent scholar & editor for The Progressive magazine) [catchingawave.org](http://catchingawave.org)





## Dublin Maker

Vicky Twomey-Lee, Laura Tobin, Jeffrey Roe, David McKeown and Tomas Ward

Dublin Maker is an annual free, family friendly showcase of invention, creativity and resourcefulness from the local community of makers. Makers range from tech enthusiasts to crafters, educators, tinkerers, hobbyists, engineers, artists, science clubs, students, authors and commercial exhibitors. In 2019 we had over 60 diverse makers of all ages and backgrounds, exhibiting projects from traditional lace making to satellites.

Dublin Maker allows the public to see technology such as 3D printers, CNC, wood turning, Raspberry Pi and lasers in action and accessible outside of academic, commercial and industrial settings. Many of the stands encourage active participation so visitors can try their hand at the project rather than just viewing a demo of finished product. This approach allows for a two-way dialogue with public engagement which benefits both the makers and the visitors. We have found that as a result, visitors have taken up new skills, there has been collaborations and former visitors have become makers the following year.

Each year the event has grown and expanded to become more inclusive and to reach audiences that aren't already interested in STEM. We check for barriers to access to Dublin Maker and implement changes to ensure that we have accessibility.

This year Dublin Maker launched a new 2-year programme, MADE funded by Science Foundation Ireland and hosted by Dublin City University. MADE will knit together a currently fragmented regional maker scene through the introduction of a series of initiatives coordinated by our Maker Advocate, Vicky Twomey-Lee. One of the first projects with MADE was in collaboration with DCC Libraries on converting a mobile library van into a mobile maker van which is now in operation.

Dublin Maker's mission is to entertain, inform and connect the makers of Ireland, while inspiring the next generation of Ireland's makers and inventors.



## Engaging young people with cancer immunotherapy communication using a creative arts (STEAM) approach

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We know that having fun while learning affects motivation and memory retention. With this in mind, we designed a workshop called 'Cancer Uncovered' for 15-17 year olds, which explains the basics of cancer biology, the immune system, and cancer immunotherapeutics. This was funded by the KEDS programme from the HRB. The workshop designed to run over four days, consists of topic-focused talks and especially designed interactive learning activities/games (Fig 1). These are interspersed with 'creativity' sessions such as stop motion with plasticine (Fig 2), a print workshop (Fig 3), and drama, all designed to give students opportunity to explore material introduced during the focus sessions. This STEAM approach allowed students to creatively explore and consolidate scientific vocabulary and concepts they had acquired throughout the day.

We ran the workshop for the first time in November 2018. 23 transition year students (13 girls and 9 boys) were recruited through Science Gallery Dublin from across Ireland. 50% of places were held for schools in communities at risk of disadvantage and social exclusion.

Participants' knowledge was evaluated on the first and final day of the workshop. We saw a significant increase in understanding, particularly when the information acquired was accompanied by learning activities/games. For example, we had a game based on metastasis - on the first day, 35% of the class correctly answered the question 'what is metastasis', whereas on the final day, 100% of students got this correct. We also assess enjoyment; 86.4% of participants would recommend the workshop to a family member/friend, and when asked if they had enjoyed the week, all participants answered 'yes'.

In the future, we hope to bring this workshop to teenagers who have been diagnosed with cancer, as it has been demonstrated that individuals who understand their diagnosis and treatment have a better prognosis.



Figure 1: Some of the games created to enhance students learning experience.



Figure 2: Snapshots of the claymation creations.



Figure 2: Output from the print workshop carried out by participants.



## Harnessing the power of digital badges to help create future ready Graduates

O'BRIEN Anne Marie

Ireland

Higher education has seen an upsurge in recent times in using digital badges for student development. According to a study carried out in 2017 <sup>[1]</sup> many students in higher education today have grown up with the internet and consider digital media to be a very useful learning tool. A Digital Badge represents an accomplishment in the same way that a traditional badge such as one received from the girl guides would. However, a digital badge is available on line and contains all the metadata and links required to explain its context and meaning. In essence digital badges are used by educators to promote three things: motivation, status recognition and evidence of achievement <sup>[2]</sup>. Taking all this into account they have the potential when used correctly to become an alternative system for awarding micro-credentials. The piece of work undertaken for this paper looked at a large scale pilot study to award Digital Badges to participant and category winners in Ireland's first Science Undergraduate Research Experience network (SURE) conference (2018) aimed at students from Institutes of Technology. The conference ran simultaneously over three venues with over 28 oral presenters, 64 poster presentations and almost 600 delegates. A total of 104 digital badges were awarded from the SURE network with an acceptance rate of 79%. A follow up survey of recipients revealed that while 90% had never come across a digital badge they found it easy to accept and 75% said they would use it on LinkedIn and CV. The recipients found the badges a motivating factor, some expressed concerns that employers might not recognise their value yet. However, 58% still stated that they would be useful for their career. Following on from this successful pilot, the digital badges will be used in subsequent SURE network conferences with an annual evaluation measuring the impact of the badges planned.

**Keywords:** Digital badge, Undergraduate Science Research, Conference, Impact

[1] Dowling-Hetherington, L. & Glowtaz, M. "The Usefulness of Digital Badges in Higher Education: Exploring the Students' Perspectives", Irish Journal of Academic Practice, Dublin, 2017.6(1).

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## How to bring Immunology to schools – a best practice report for a school lab

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Right now in Germany the topics of immunology and the immune system are not being taught at schools. Rising numbers of non-vaccinated children and adults are presenting a high risk of once eradicated infectious diseases coming back. To teach young students about the immune system and how lab-work is being done in an immunological environment, we established from scratch a school lab called ‚ImmunoLogisch‘. It consists of two parts: first lab work by conducting an experiment dealing with measles and second a part where the students learn about the day of a technician in the lab with a video in selfie-style and a tour in the biggest lab on campus with over 40 technicians working in it. The students are drawn to the topic in the beginning by starting with building a scenario of a measles outbreak in which they should provide help. The school lab finishes with a discussion about vaccination. Next to the topic of immunology, students are as well being educated about scientific methods and good scientific practice in the lab. The whole concept was embedded in the program for Promoting Youth Scientific Career Awareness and its Attractiveness through Multi-stakeholder Cooperation –MultiCO. MultiCO was funded within the Horizon2020 project from the European Union.



## How to bring 60 nerds together on a stage?

Dr. Veli Vural Uslu

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One of the biggest challenges of science communication is to bring the laymen, who are not interested in science, and the researchers, who are not interested in laymen, together. In order to engage researchers in science communication and the public in science, a theatre based experiment, which I initiated four years ago, can serve as a successful model platform.

This project, SciComHD, began with a few random researchers in the university campus. After a few rounds of simple stage training, the rehearsals turned into an ever-growing platform where researchers could express their daily frustrations -sometimes very vividly. With the plenty of stories that researchers brought in from their laboratories, we wrote and performed several theatre plays such as „Romeo and Juliet in the Lab“, where Romeo and Juliet are two PhD students who fall in love at a conference and their competing bosses do not let them be together. In parallel, the actors also participated in a new format of science communication and talked about their actual research in a theatre set up or they just danced their research on the stage.

So far, this project has gathered more than 60 scientists from 30 countries and we performed 10 different theatre plays and several dozens of shows. The tickets were sold out in almost every single show and we manage to reach out to several thousands of people. All of these projects run with no external funding and in a non-profit basis to be a sustainable model even for low budget local initiatives in the future. Altogether this fun experiment demonstrates that such theater based projects can be a successful model to encourage the scientists for reflecting on their extraordinary research and ordinary lab life to laymen.



## Introducing Creativity into a Postgrad Outreach Module

Name: Dr John O'Donoghue

Institution: Trinity College Dublin and The Royal Society of Chemistry

In TCD Chemistry our PhD students complete a semi-structured programme with a number of flexible modules available to fit around their research. The Outreach Module has formalised the education and public engagement training for our PhD students, with a summarised version of the module rolled out to other institutions as well. Spectroscopy in a Suitcase (SIAS) is an SFI funded hands-on activity delivered in schools by postgrad student ambassadors from 6 institutions. It has been running in Ireland for over 5 years, giving hundreds of chemistry PhD students a unique opportunity to hone their communication skills.

SIAS forms a key part of the Postgrad Outreach module in TCD and UCD since it acts as the core “work experience” component alongside other opportunities. The module also includes formal workshops in Science Communication, Evidence based Science Education theories and Self-Reflection. Starting last year, part of the module assessment now requires students to work in pairs to create and test new outreach activities, presenting their ideas to the wider TCD Chemistry community for critical discussion. They are assessed on the originality and accessibility of their idea as well as their presentation skills and style of delivery.

This poster will present the results gathered from participants through a focus group interview run in 2018 and two surveys conducted in 2016 and 2018. Key skills identified by the PhD ambassadors which were developed or improved by SIAS include “Public Speaking” and “Science Communication” among others. In terms of training; 63% of the respondents felt further training in presentation and communication skills would be useful. The results from this research were collated and formed the basis of the redesigned Outreach Module. The newly revamped module has just completed its first full academic year and the feedback from participants has been very positive to date.



## Purls of wisdom: spinning a yarn of Ireland's changing climate to understand the knitty gritty of a sustainable future.

Elsbeth Wallace<sup>1</sup>, Fergus McAuliffe<sup>1</sup>

<sup>1</sup>Irish Centre for Research in Applied Geosciences, UCD

Earth's climate is warming. This is an indisputable fact, is regularly reported on and is understood by publics on a global scale. However, on a local scale, the problem is less visible. Purls of Wisdom is a new, yarn-based approach to raising awareness of Ireland's changing climate. The project aims to reach new audiences within artistic/crafting circles. During their participation with Purls of Wisdom, those involved are empowered to create visual art which displays the effects of a warming climate on Ireland specifically. Participants use climate datasets to create blankets, garments or other visual art forms which display data through arrays of colour. Data is split into a colour story in which each colour represents a subset of data (e.g. 10°C or 2mm rainfall) and each row of knitting/crochet/other represents a year. In this way, the created endpiece displays change in climate through time as colour shifts.

A key consideration of the Purls of Wisdom initiative is sustainability. Participants are encouraged to use yarns for their projects that contain natural fibres, ideally sourced from, spun and dyed in Ireland. This limits the amount of non-recyclable materials used during the initiative, and the initiative's carbon footprint. A potential expansion for Purls of Wisdom will include further emphasis on the 'fast fashion' industry and creation of raised awareness of its contribution to climate change.

The Purls of Wisdom initiative, which began in November 2019, will run the course of a year, culminating in a showcase of the projects in December 2020. A network of crafters across Ireland are involved in the initiative, however the project is open to anyone interested and that wants to be involved. Please don't hesitate to get in touch and join the Purls of Wisdom community!



## Real Talk with Real Mums



*James Keyes*

*Real Talk with Real Mums* is a ten-episode podcast series discussing the issues of everyday pregnancy with medical professionals and the real women who have gone through the pregnancy journey. Each episode tackles a different topic, from exercise in pregnancy with a physiotherapist to mental health issues in pregnancy with a mental health midwife.

Each episode offers mothers, mothers-to-be, and the general public practical, realistic, snapshots of the pregnancy journey, tempered by expert insight. The final bumper-sized episode will be recorded live in the Pillar Room of the Rotunda Hospital to a live audience on 8<sup>th</sup> December, marking the culmination of the series. A panel of experts will be available on the day to take questions from mothers and pregnant women in the audience and the event will be compered by our podcast host, Louise McSharry.

By engaging with mothers, pregnant women, and their partners through the podcast, *Real Talk with Real Mums* taps into a new medium of dissemination for research findings and leaves current and future parents feeling better prepared. The content featured in this project stems from the HRB Mother and Baby Clinical Trials Network's key research themes around perinatal health, bringing the expertise of healthcare professionals from around Ireland into the hands of the general public and making the journey of pregnancy more understandable. Using social media channels, it also offers a way for people to engage with the topics at their own pace and to listen either independently or with a partner or friends.

The podcast has accrued over 13,000 streams across three continents.

This project is an initiative of the HRB Mother and Baby Clinical Trials Network and the Rotunda RCSI Research department and was funded by the Health Research Board through its Knowledge Exchange Dissemination Programme.



## Science for All: Communicating Science to children with sight loss

*Sonia Marie Lenehan*

In Ireland, 5,772 children (2016 census) are blind or visually impaired. The National Council for Special Education research report No.23 (2016) highlighted that visually impaired students identified science as a subject difficult to access in school. This may be because as a society we are overly dependent on visual instruction for teaching and relaying scientific concepts. As a result, only 1.2% of third level education students with disabilities studying science are visually impaired or blind according to 2017/2018 report by AHEAD (Association for Higher Education Access & Disability). These figures highlight the need to enable children with sight loss to engage with science at a young age and to enable teachers to make science accessible for everyone in the classroom.

This project aims to make science more accessible by creating a safe space for children with sight loss to explore science. A secondary aim is to establish a workshop aimed at teachers to help them build the confidence and knowledge to communicate science to children with sight loss.

In July 2019, I worked with researchers, youth advocates with sight loss, and the national sight loss agency, the National Council for the Blind Ireland (NCBI), to collate resources and materials for a workshop. Eleven young people with sight loss, ranging in age from 11-19, took part in a focus group to help identify resources that are required to communicate effectively and to finalise workshop content. Anatomical models, skeletons and games were sourced through generous donations and the prize money awarded by 'I'm a scientist get me out of here'.

The project is still developing, and a second focus group will take place in November with the plan to roll out the project by summer 2020. Science for All is an innovative way to support greater inclusion, engagement and involvement in science. Informed by my findings, I hope that this approach has the potential to be replicated elsewhere.



## Telling the story of sewer fatbergs using creative approaches

Thomas (Tom) P. Curran<sup>1</sup>, Barry Orr<sup>2</sup>, Nathan T. Wright<sup>3</sup>, and Michael O'Dwyer<sup>4</sup>

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The word 'fatberg' entered the Oxford English Dictionary in 2015 and is defined as 'a very large mass of solid waste in a sewerage system, consisting especially of congealed fat and personal hygiene products that have been flushed down toilets'. While the occurrence of fatbergs is a global problem, it is particularly prevalent in the UK with about 300,000 sewer blockages every year, costing about £100 million. A key approach to addressing the issue is to raise awareness among the public and business community in order to reduce the amount of fat, oil and grease (FOG) and sanitary items such as wet wipes that are discharged into the sewer.

Engagement by water utilities or companies such as SwiftComply typically takes place directly with food service establishments while public events are also organised. Fatbergs have been highlighted many times in the media, most notably the Whitechapel fatberg, which was found in London in 2017, weighing 130 tonnes (equivalent to 19 African elephants) and measuring 250 metres in length (as long as two football pitches). The research results from Barry Orr (a.k.a. Captain FOG) on so-called 'flushable' wet wipes gained widespread publicity and the "Your Turn" FOG cup is effective for residents.

Creative approaches have also been used to get the message across. Nathan T. Wright created a 'Fatberg' character for an illustrated book 'Adventures of Fatberg'; this highlighted how fatbergs could be converted into biofuels. Tom Curran (a.k.a. Dr. Fatberg) performed a stand-up comedy set at Bright Club Dublin, which is available on YouTube. More recently, Nathan T. Wright created a follow on comic book 'Attack of the Fatbergs' in collaboration with SwiftComply; it is a tale of time travel with 'Fatberg', 'Captain FOG', 'Dr. Fatberg' and 'Dr. Sophie Quinn' trying to save Christmas from the menace of fatbergs. There appears to be significant interest in all these initiatives.



## The IS-SEC-Q: A validated instrument to assess the impact of science outreach interventions on children's confidence to do science

*Sarah Carroll<sup>1</sup>, Veronica McCauley<sup>2</sup> and Muriel Grenon<sup>1</sup>*

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To increase the socio-scientific literacy of the upcoming generation, many scientist-led outreach programs aim to improve children's engagement in science. Some outreach programs use creativity-based methods to achieve this, such as Makerspaces, inquiry-based learning, and art-based activities. It would be beneficial for outreach practitioners to be able to determine whether their creativity-based intervention has an impact on participant's engagement with science. However, the term 'science engagement' can be ambiguous and as a multi-faceted construct, it is difficult to measure. Outreach programs wishing to assess their impact on participant's science engagement may wish to target a different related outcome, such as increased science self-efficacy. Science self-efficacy can be described as the self-belief an individual has in their science abilities. It has a positive relationship with motivation, aspiration and engagement with science. Currently, there is a paucity of research examining the influence of science outreach programs on children's science self-efficacy, possibly due to the lack of a suitable instrument.

This poster will present the Science Self-Efficacy Children's Questionnaire (IS-SEC-Q). It contains five sections, each with statements (65 in total) that participants answer using a 7-point Likert scale (e.g. strongly disagree to strongly agree). Each section relates to a different aspect of science self-efficacy: a) general academic self-efficacy, b) performance, c) knowledge, d) sources and e) tasks. The post-intervention version also has an additional section: f) perceived scientist competence. The IS-SEC-Q has been tailored to align to the learning outcomes of the Irish primary science curriculum (5<sup>th</sup> and 6<sup>th</sup> class) and include scientists as influencers of science self-efficacy beliefs. It has been validated in an Irish context and demonstrates good psychometric properties. It should serve as an invaluable tool for practitioners wishing to assess the impact of their creative science interventions on children's science self-efficacy beliefs.



## The use of graphic design to improve science communication within Irish research projects

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In today's media-rich society, the value of high-quality visual communication cannot be understated due to its power to draw in target audiences, explore thematic areas in depth, and make specific information accessible to lay audiences. When used to communicate scientific research, visual graphics have the power to inform, persuade, and delight a wide range of audiences, including decision-makers and non-scientists. Graphic design and illustration can make complex scientific information more attractive, understandable, and more accessible, especially as visual graphics can be shared easily across digital platforms. This poster will showcase how graphic design has been used to democratise research findings, clarify scientific messages, and incentivise audiences to take notice of key environmental outputs from European-funded international research projects. From underwater noise to eco-engineering, visual communication can facilitate the dissemination of scientific information from academia to decision-makers and non-scientists.



## Undergraduate Student Co-Creation of an Intervention to Promote Physics to Female Secondary School Students

*Elora McFall, Aaron Cusack, Cian McKeown, Ian Clancy and Gráinne Walshe. University of Limerick*

A group of undergraduate students came together with postgraduates and University of Limerick staff to co-create the SOPHia Project. This project aims to encourage female uptake of physics for the Irish Leaving Certificate. Currently, in Ireland, the uptake of physics at this level is 25% female and 75% male. Five main undergraduate students contributed to the design of the workshop and in early 2018, with the support of the Institute of Physics in Ireland, an initial pilot program was launched. Following the positive impact of SOPHia on the attitudes of female students towards physics, the project received funding under Science Foundation Ireland's (SFI) Discovery programme. Subsequently, SOPHia has expanded and a larger group of student facilitators are now involved. The focus of this poster will be on both the central involvement of the initial undergraduate coordinators and the impact of involvement with SOPHia on the new cohort of students involved.



What do evaluation practices reveal about the working life of public engagement professionals in Ireland? An exploration of the experiences of Education and Public Engagement managers in SFI Research Centres.

*Sylvia Leatham, Dublin City University*

The Irish government is investing millions of euro in scientific research, in an effort to boost Ireland's economic competitiveness. Alongside research obligations, institutions and researchers funded by the State are obliged to carry out public engagement activities. There are growing expectations that these outreach activities be evaluated – that is, measured in some way for impact or effectiveness. However, much evaluation activity is 'hidden' in unpublished reports to funders, and scholarly publications on evaluation are few and far between in Ireland.

Both the academic arena and the field of practice in public engagement suffer from a lack of agreed standards around evaluation: There are no generally agreed measures of efficacy, definitions of success, or even, at times, definitions of terminology.

An examination of the evaluation practices of publicly funded scientific research centres in Ireland – carried out during a master's in Science Communication at Dublin City University - aimed to identify current practices, establish common themes and highlight 'pain points'. A qualitative approach was used to thematically analyse the knowledge, behaviour and experiences of public engagement professionals employed by Science Foundation Ireland Research Centres. These Education and Public Engagement managers are responsible for the coordination, delivery and evaluation of outreach programmes on behalf of their research centres.

Analysis of ten semi-structured interviews resulted in six themes:

- Lack of resources
- Knowledge, expertise and training
- Qualitative data and evaluation as research
- Isolated autonomy and the desire to collaborate
- Approaches, methods and challenges
- Attitude and motivation

This study yields a partial insight into the working life of a public engagement manager in a third-level institute, combined with findings around evaluation practices, attitudes and behaviour in SFI Research Centres. Recommendations are presented for consideration by those interested in enhancing the evaluation skills, capacity and support for research centres and their public engagement managers.

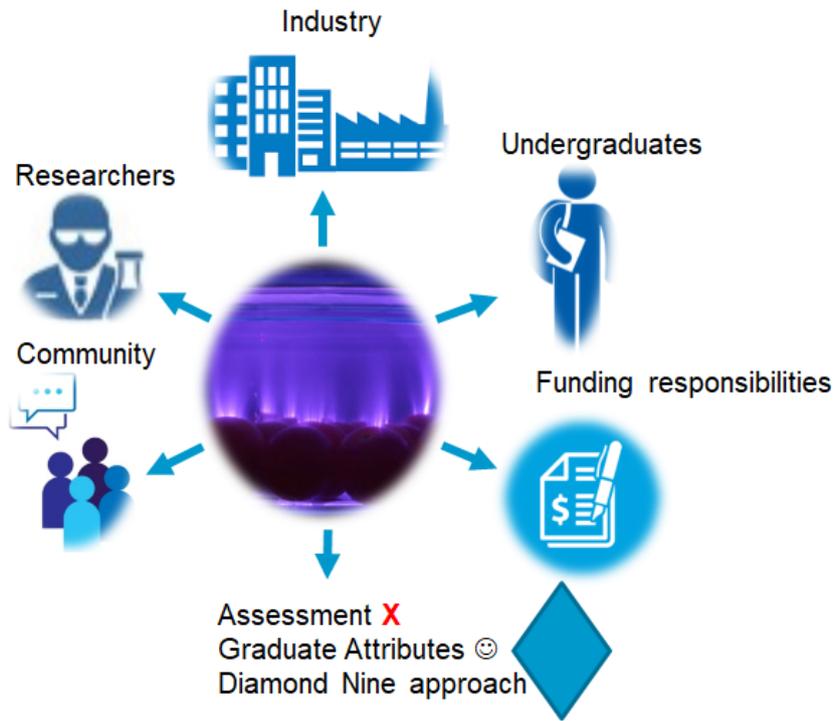


## Communicating Plasma Bio-Sciences Research and Innovations to new audiences

Plasma group, Technological University Dublin, City Campus, Dublin 7, Ireland

A communication gap has been identified between the scientific research community and non academic audiences. The community, schools and industry audiences are important components of research engagement and communication activities as they are key stakeholders in the knowledge developed as well as defining the priorities for research. The plasma group developed a range of activities to act as a bridge and respond to identified communication gap, initiated through the All – Island *PlasmaAPPS* network in 2017. The scientific research focus is plasma biosciences with related technology and innovations, with medium to long term impacts towards addressing several sustainable development goals and societal issues including antimicrobial resistance, toxic residues, human health, food safety and agricultural sustainability. These are all issues of relevance to society and a range of engagement activities are underway.

The key audience identified were industry, academia, public and community which includes primary and secondary school level children. An important component is building these activities into the undergraduate modules to build a research connected curriculum that is engaged with the locality and wider society, in cooperation with the access and civic engagement functions. Several ongoing projects that reach local secondary schools and the wider public including Airfield festival of food. Activities were developed to highlight food literacy and sustainability. The process and challenges of embedding research engagement activities into the undergraduate curriculum in conjunction with funded research teams is highlighted through the Glow to make your plants grow initiative applying cold plasma technology to promote plant germination and growth.





## FOODIE SCIENCE CAMP

Graham O'Neill TU Dublin - City Campus

In June 2019 TU Dublin hosted the “Foodie Science Camp” designed at teaching 14-18 year old students a variety of different topics in physical chemistry through the medium of food. Food is an ideal medium through which to teach aspects of physical chemistry as students are familiar with food and its properties while it also leads to an immersive experience. The science camp taught students about phase changes, rheology, polymer crosslinking and surface tension. An “example first, theory second” approach was used for teaching.

### **Phases changes**

Lipids and sugars undergo phase changes from solid to liquid or glassy to rubbery in response to temperature/moisture. A sub-group of students melted a batch of chocolate and mixed in 10 % additional fat including milk fat, coconut fat and sunflower oil before cooling the chocolate to reform the solid. The class were asked to determine the melting point of each chocolate and form a hypothesis as to why the melting points were different, all hypothesis were discussed among the group.

### **Polymer Crosslinking**

A sub-group of students made edible cutlery to avoid the need for single use plastics. Using a mould, students formed spoons from whey proteins, carrageenan and gelatine using two variables (i) temperature (ii) crosslinker concentration. The class were asked to “road-test” the cutlery, suggest an optimum combination of polymer, temperature and crosslinking concentration and compare their findings to those of an Instron texture analyser.

### **Surface tension**

Students formed marshmallows using either egg whites, whey protein or casein to investigate the importance of protein structure on air:liquid interfaces before determining the impact of oil addition and competitive adsorption presented by a third phase.

A further two “Foodie” science camps will be held in 2020, presenting at SciCom 2019 will enable science communicators to share ideas/suggestions that will enhance future Foodie science camps.