



Malta's Science and Arts Festival Focuses on the Science of YOU

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Malta organises one of the largest celebrations of researchers around Europe. As part of the EU-wide European Researchers Night (ERN; Marie Skłodowska-Curie Actions of the Horizon 2020 Program (H2020, 2014–2020)), Science in the City is Malta's platform to engage citizens with the latest research and scientific projects happening around the Maltese Islands.

From 2018–2019, 55 ERN projects ran in 371 cities across Europe, Turkey, Israel and other countries. During the 2018 ERN, over 1.5 million visitors attended. The Maltese ERN ranked 7th from 128 applications and began in 2012, attracting just over 10,000 visitors. It has now grown into a science and arts festival that attracts 30,000 people, around 6% of the Maltese Islands' population.

The festival uses an approach that combines science with the Arts, including research from every academic discipline, from history and accountancy, to medicine and ICT. This reflects the worldwide shift from using a STEM (science, technology, engineering and maths) approach in education to further include the Arts, now recognised as a STEAM approach. In line with several aims of Science in the City, the combination of humanities and STEM disciplines has been correlated with an increased interest and passion in scientific subjects, leading to STEM careers (Land, 2013; Reiter, 2017; Segarra, Natalizio, Falkenberg, Pulford & Holmes, 2018).

The festival uses an open and inclusive approach to involve and provide a platform for as many researchers as possible. Open calls (followed by a rigorous evaluation) are used to attract the most creative ideas from both artists and researchers in order to engage citizens. The festival also approaches many research groups, departments, faculties, companies, NGOs, and government institutions, resulting in 94 partners being involved in the festival in 2018. This resulted in over 600 personnel (including 400 University of Malta, Junior College and MCAST students) participating in the festival, around

100 of which were active researchers.

The festival encourages everyone to participate, provided that they use a creative inquiry-based science education approach which is hands on and engaging (Murphy & Beggs, 2003; Rocard et al., 2007; Chappell, Hetherington, Ruck Keene, Slade & Cukorova, 2016). This approach fosters dialogue between experts and participants, while building participants' confidence in the subject and inspiring further interest. It can be challenging to implement but maintains the public appeal and festival quality.

The festival is rigorously evaluated every year to inform organisers in order to enable them to continuously improve the festival. A survey methodology is used that has shown numerous important findings. The festival is seen as a largely family friendly event; in 2016 more than 50% of people surveyed attended with their family. However, a large percentage of the festival is attended by 16–25 year olds (teenagers and students), thus the festival is now designing tailored events to cater for them. In the same year, 42% of participants attended for the first time, showing that Science in the City attracts new audiences. Despite these findings, only 54.6% of festival volunteers initiated conversations with participants and 14.6% used difficult jargon, hence the festival has now focused volunteer training in order to address these issues. Several other findings are in preparation for publication in order to aid other festivals to use similar evaluation processes.

In 2019, the festival theme, 'The Science of YOU', focussed on the science of human development. This concept aimed to demonstrate how scientific research is geared towards human advancement. Science creates knowledge and solves problems, giving us the power to make decisions and shaping our actions. It defines who we are by giving us options, affecting the way we think about ourselves, others and the environment.

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The festival covered topics from personalised genomic medicine and bio banking, to Artificial Intelligence and the Environment. One of the main artworks was *Xewk*, a project led by Prof. Ruben Paul Borg with a team of architects (ICE & MGPEI (Malta Group of Professional Engineering Institutions)), and Student Chapter University of Malta from the Faculty for the Built Environment, who used computer programmes to create an emergent design based on parametric modelling techniques. The team created a light strong design inspired by Maltese trees and spines, which was around 2 m in length and width, 1 m high and only weighed 25 kg. The artwork was made out of high-performance fibre-reinforced cement, which is a sustainable solution that can be implemented in current building designs (Borg, Bondin & Mangion, 2019).

The other main artwork *Spherical* was created by Louis Briffa. Five illuminated glass spheres reflected the topics of Artificial Intelligence, Biotechnology, Cloud Computing, Blockchain and Nanotechnology. These subjects are intensely researched at the University of Malta and celebrate local achievements.

The festival also featured *Creative Jam*, a collaboration between Diccon Cooper's band Stretta Swing and The Edward De Bono Institute (University of Malta), who used creativity tests to analyse if the techniques behind jazz improvisation affected a listener's creativity. Furthermore, to raise awareness about neurodiversity, Moveo Dance Company performed a dance called *Diversely Typical*. Neurodiversity is the concept that neurological disorders such as ADHD and autism are just another way of behaving, and that people living with these conditions need to be accepted and included in an environment that facilitates them to live fulfilling lives within society. The festival also worked with NGO Green House to create *Hanging On*, an interactive performance that allows participants to choose whether or not to save bats in Malta through research. Alongside these unique activities, the festival includes many science shows, hands-on experiments and interactive technology (digital games, VR and others) from every major education institution on the Maltese Islands.

The festival now attracts science communicators, researchers, performers and artists from around 10 different countries.

All of these events are attempting to attract diverse groups of people within society. It is evident that using a one size fits all approach to marketing and communications does not work, therefore, a targeted approach is used to attract large audience numbers effectively, in order to achieve the festival's aims. These include, increasing the viability of researchers in Malta and showing how their work impacts everyday life. In addition, highlighting that research is a creative profession for all genders and sexualities, that it is fun and inspiring to encourage STEM career uptake, and that scientists and artists can work together to enhance both professions

for the social and economic progress of a country. Furthermore, achievement of these ambitious goals will require multiple initiatives, time, partners, and significant resources.

Science in the City is part of the EU-wide celebration-European Researchers' Night. It is funded by the Marie Skłodowska-Curie Actions of the Horizon 2020 Program of the EU, as well as a number of corporate sponsors, and is recognized as a Festival by 'Europe for Festivals and Festivals for Europe' (EFFE).

The consortium is led by the University of Malta, Malta Chamber of Scientists and the University's Research Trust (RIDT), in partnership with Parliamentary Secretary for Financial Services, Digital Economy and Innovation, Ministry of Education and Employment, MCAST, Esplora, JUGS Ltd, Studio 7, BPC International, GSD Marketing Ltd, Aquabiotech Ltd, MEUSAC, PBS, Spazju Kreattiv, Valletta Local Council, Malta Council for the Voluntary Sector, Small Initiatives Support Scheme, More or Less Theatre, Transport Malta, Kreattiv and Creative Community funds, and Arts Council Malta.

For more info about the festival see www.scienceinthecity.org.mt and www.facebook.com/ScienceInTheCityMalta.

To be part of the festival email: info@scienceinthecity.org.mt or edward.duca@um.edu.mt.

References

- Borg, R. P., Bondin, W. & Mangion, F. (2019). *Emergent Design for Complex structures based on High-Performance Fibre-Reinforced Cement Based Materials*. Manuscript Submitted for Publication.
- Chappell, K., Hetherington, L., Ruck Keene, H., Slade, C. & Cukorova, M. (2016). *D2.1 The features of inquiry learning: theory, research and practice*. Retrieved from <http://creations-project.eu/wp-content/uploads/2016/09/Download-3.pdf>. CREATIONS EU project.
- Land, M. H. (2013). Full STEAM Ahead: The Benefits of Integrating the Arts Into STEM. *Procedia Comput. Sci.* 20, 547–552.
- Murphy, C. & Beggs, J. (2003). Children's perceptions of school science. *Sch. Sci. Rev.* 84(308), 109–116.
- Reiter, C. M. (2017). 21st Century Education: The Importance of the Humanities in Primary Education in the Age of STEM. *Senior Theses and Capstone Projects*, 65.
- Rocard, M., Csermely, P., Jorde, D., Lenzen, D., Walberg-Henriksson, H. & Hemmo, V. (2007). *Science education now: A renewed pedagogy for the future of Europe*. Brussels: European Commission.
- Segarra, V. A., Natalizio, B., Falkenberg, C. V., Pulford, S. & Holmes, R. M. (2018). Using the Arts to Train Well-Rounded and Creative Scientists. *J. Microbiol. Biol. Educ.* 19(1), 19.1.53. www.xjenza.org