



Open Research Online

Citation

Rolfe, Samantha M. and Gallaway, Mark (2017). Fantastic worlds and where to find them: astrobiology outreach for KS2 and KS3. In: 7th Astrobiology Society of Britain Conference, 13-14 Sep 2017.

URL

<https://oro.open.ac.uk/51045/>

License

(CC-BY-NC-ND 4.0)Creative Commons: Attribution-Noncommercial-No Derivative Works 4.0

Policy

This document has been downloaded from Open Research Online, The Open University's repository of research publications. This version is being made available in accordance with Open Research Online policies available from [Open Research Online \(ORO\) Policies](#)

Versions

If this document is identified as the Author Accepted Manuscript it is the version after peer review but before type setting, copy editing or publisher branding

Fantastic worlds and where to find them

Astrobiology outreach for KS2 and KS3

Samantha M Rolfe^{1,4}
Mark Gallaway^{2,3}

s.rolfe2@herts.ac.uk
m.gallaway@herts.ac.uk

7th Astrobiology Society of Britain Conference, The Open University, Milton Keynes, UK, September 2017

Introduction

The University of Hertfordshire runs an extensive Physics & Astronomy outreach scheme in collaboration with The Ogden Trust to provide opportunities for schools to promote STEM subjects. Recently this outreach programme has incorporated astrobiology activities and we are developing an astrobiology workshop.

The Kings College London SPIRES Report (2013) introduced the concept of 'Science Capital' and the importance of early years outreach in addressing aspirations towards STEM careers. Additionally, in recent years science educators have become aware of the so-called *Key Stage Three (KS3) Hump*, the drop off in science engagement by pupils aged 11 to 13, where children become discouraged in choosing science as a career.

To encourage more children into STEM subjects, capturing their imaginations and interests prior to or in early KS3 may be able to counteract the KS3 Hump.



Art work credit: Johan Meuris

Figure 1: The large, inflatable mobile dome that can seat up to 100 people provides an immersive astronomical experience (left). Example of the 360° view provided in the domes, inside the fixed dome (right).

Do you do KS2 or KS3 outreach?

This presentation aims to promote discussion around astrobiology outreach for pupils aged 7 to 13.

Can we share or pool resources to be further exploited to provide a more comprehensive and inclusive experience for pupils of all abilities?

Have you run outreach exclusively targeted at KS2 to KS3?

Our astrobiology workshop

The astrobiology workshop will have the following activities:

1: *What is life? How do we recognise it? Can we really recognise it?* Addresses the curriculum requirement 'living things and their habitats'.

2: *Extremophiles identification.* Using University of Montana and Yellowstone Park lake colour wheels.

3: *Tardigrades.* Hands-on experience of using a microscope to view an extremophile that lives locally.

4: *Viking lander soil experiment.* Using our three samples of 'martian soil'.

5: *Group discussion.*

Focussing on where we might find life in the Solar System and what does that mean for the 'Goldilocks Zone'.

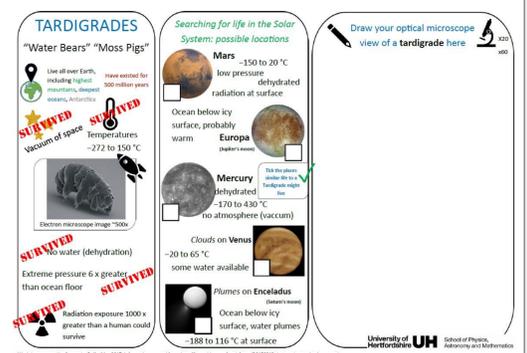


Figure 2: Worksheet on tardigrade survival conditions verses environmental conditions on planetary bodies.

Resources and results

The University of Hertfordshire has a long history of presenting astronomy-centric planetarium shows and owns three planetaria (one fixed, two mobile and flexible HD projection systems). During the 2016/17 outreach season, the Outreach Team delivered workshops and activities to over 15,000 children, of which 10,000 were KS2.

Our new astrobiology programme will include astrobiology and exoplanet workshops and will use this equipment to present shows discussing exoplanets, including the discovery of an exoplanet around the nearest star to Earth, Proxima Centauri; extremophiles and the conditions they live in on Earth, and the similar conditions that exist in our Solar System and potentially on known exoplanets.

We are currently developing an astrobiology workshop, aimed at KS2 and KS3, to be incorporated into the overall outreach programme. This includes a hands-on microscope experience where

pupils can observe tardigrades and learn how they are important to astrobiology, and fill in/take home custom-made worksheets on how to find their own to examine.

Feedback from initial trials suggested that several pupils requested microscopes for presents since attending the outreach event.

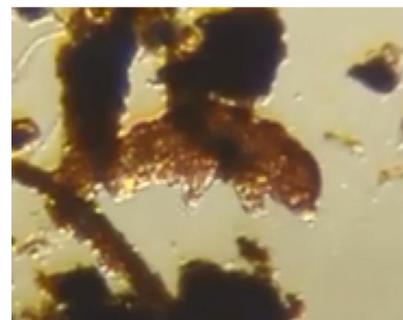


Figure 3: A tardigrade (local to Bayfordbury Observatory) as viewed through a ×60 microscope lens. The view pupils had during outreach events.

Acknowledgements

University of Hertfordshire **UH**



Further information

Please email to continue our discussion and/or for further information. You can find a copy of this poster at <http://star.herts.ac.uk/~srolfe>

Literature cited

Kings College London (2013) SPIRES Young people's science and career aspirations, age 10-14. [online] Available at: <http://www.kcl.ac.uk/sspp/departments/education/research/ASPIRES/ASPIRES-final-report-December-2013.pdf> [Accessed: July 2017]

¹ Bayfordbury Observatory, Physics, Astronomy and Mathematics, University of Hertfordshire, Bayfordbury, Hertfordshire, SG13 8LD, UK (s.rolfe2@herts.ac.uk)

² Physics, Astronomy and Mathematics, University of Hertfordshire, College Lane, Hatfield, Hertfordshire, AL10 9LB, UK

³ The Ogden Trust (Registered charity: 1037570), Unit 3c, The Phoenix Brewery, 13 Bramley Road, London, W10 6SP, UK

⁴ Planetary and Space Sciences, School of Physical Sciences, The Open University, Robert Hooke Building, Walton Hall, Milton Keynes, MK7 6AA, UK