Outreach project
Giant waves in the ocean: from sea monster to science

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Integrability, Integrable Systems
Analysis of PDEs
Nonlinear Waves

The Onset of Rogue Waves

7th & 8th April 2017
Northumbria University
City Campus

Scientific Committee
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Organising Committee
Fabio Briscese
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The workshop is funded by the Maths Foresees Network (Leeds) and supported by the Extreme Environments theme (Northumbria).

There is no registration fee: if you would like to attend please contact Dr Fabio Briscese (fabio.briscese@northumbria.ac.uk) or Dr Benoit Huard (benoit.huard@northumbria.ac.uk).
There isn't a problem

It's not my/our problem

It's a woman's problem

Gender equality in Science
Dream jobs

Girls aged 7–10

“Scientist”
“Doctor”
“A famous runner that runs for Britain!”
“A United Nations Women’s Goodwill Ambassador”
“YouTuber”
“Footballer”
“Pilot”
“Teacher”

Girls aged 11–16

“Chef”
“An actor and author”
“Astronaut”
“Vet”
“Architect”
“Nurse”

Girls aged 17–21

“Car mechanic”
“Fashion designer”
“Having my own business”
“Lawyer”
“Psychologist”
The shortage of young people in the UK choosing to follow engineering, technology and physical science pathways from school and beyond is widely acknowledged.

While the numbers of students choosing some STEM subjects is slowly increasing, a strong gender imbalance remains in physics, computer science and engineering.

To encourage more young people to enter these areas, greater evaluation is needed, to determine what does and does not ‘work’ with STEM interventions.
The Study

We collected data from children in 12 participating partner schools. The study sought to measure children’s interest in and attitudes to science, and aspirations for STEM jobs, and allow tracking of these from primary to secondary school.

Data was collected from 2015 to establish a baseline. Baseline data reveals that:

Baseline Findings from Primary Schools

- The large majority of children report to like science but this begins to decline from as early as 7 or 8. In primary schools more girls report to like science than boys.
- Children’s confidence in their science abilities is initially high but this also declines with age.
- Girls and boys self-identify differently from as early as age 7 years. Boys are more likely to consider themselves clever than females, while females are more likely to consider themselves friendly than boys. These trends continue across all ages of study (7-16 years).
- Most children believe you need to be clever to be a scientist, but girls are more likely to believe you need to be clever to be a scientist than boys. As girls are less likely to identify as clever, this is likely to affect their future participation in science, technology and engineering.
- In primary school, more boys report to know and aspire to STEM jobs than girls. Where pupils aspire to STEM careers, girls are more inclined towards health and life sciences careers and male towards physical sciences and technology careers.
Mathematics matters!

Find out what your child did today
nustem.uk/giantwaves

mathematical modelling of environmental hazards
Giant waves in the ocean from sea monsters to science
Giant waves in the ocean from sea monsters to science

• showcase UK mathematics research around environmental challenges coming from extreme environments and environmental hazards to young people and their key influencers;

• build science capital in the North East through the linking of science and art, leading to a greater understanding of aspects of mathematics and its relevance by young people, particularly girls;

• support teachers to use applied mathematics as a context for careers and curriculum teaching;

• educate young people and the general public about mathematical challenges coming from extreme environments and environmental hazards.

• encourage uptake of maths-related subjects at higher levels (e.g. A-level and beyond);
Objectives

• work with a visual artist (Gloria Ronchi) and mathematicians in five schools to produce student artwork with the theme of nonlinear waves and the mathematical modelling of environmental hazards;

• development of a large-scale artwork and student artwork;

• work with Maths Foresees partners to develop larger public engagement projects.
Gloria Ronchi (2017)
Dichroic material
Gloria Ronchi (2017)
Dichroic material
https://nustem.uk/giantwaves/

https://nustem.uk/eveninglectures/