Discover and explore
Science & Engineering Day 2016
Welcome to Science and Engineering Day 2016

Dear Guests,

This is the 14th year that the University of Southampton has hosted a free event celebrating our Science and Engineering research and expertise. Each year we aim to have an inspiring and educational mix of old favourites and new activities for our many visitors of all ages. This year we’ve expanded to include both Highfield Campus and the nearby Boldrewood Innovation Campus. This has allowed us to offer more than 100 activities in total, to incorporate research from our Ocean and Earth scientists and to open up our unique towing tank.

We share Boldrewood with the Lloyd’s Register Global Technology Centre and we’re very pleased that they are both running marine-related activities and hosting talks in their building.

Please do join in the conversation on social media #sotsef on Twitter and www.facebook.com/sotsef

If you have a smartphone with you, we are piloting an interactive map at sciengmap.soton.ac.uk

Enjoy the day and please take a moment to give us your feedback with the tear-off form at the back of this booklet.

Ellie Cawthera and Steve Dorney
Directors, Southampton Science and Engineering Day

The team: Ellie Cawthera, Steve Dorney, Zena Hilton, Kristen Heasley, Jo James, Natt Day, Alan Wong, Reena Pau, Kate Collett

Public Engagement with Research unit www.soton.ac.uk/per

This sort of large-scale public engagement event doesn’t happen without a lot of hard work behind the scenes, and we would like to take this opportunity to thank some key people that have made this extraordinary event possible, including: William Powrie (Chair of the Southampton Science and Engineering Festival Steering Group), everyone on the Steering Group, Adam Tewkesbury from Transport, Gina Celestine at Boldrewood, Tim Pougher and Jo Rich from Lloyd’s Register, Charlotte (Charlie) Wood from Hospitality, Sue Dear from Safety & Occupational Health, Chris Gutteridge from Open Data Service, Chris Newland from Security, Gela Jenssen and Stu Hunt from The Print Centre, and Natasha Webb from Faculty of Physical Sciences and Engineering.

Our event is part of British Science Week www.britishscienceweek.org

Best Engineering Event 2009 | Best STEM Institution Event 2014

Special thanks to Gill Smith and AECOM for competition prizes

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<th>End time</th>
<th>Title</th>
<th>Booking</th>
<th>Room</th>
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<tbody>
<tr>
<td>10:45</td>
<td>11:45</td>
<td>Accelerate!</td>
<td>*</td>
<td>Lecture Theatre B</td>
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<td>10:45</td>
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<td>Astrodome</td>
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<td>Lecture Theatre 1027</td>
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<td>11:00</td>
<td>12:00</td>
<td>Science Magic...Magic Science</td>
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<td>Seminar Room 5081</td>
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<td>11:15</td>
<td>12:00</td>
<td>Bubble Acoustics - from whales to other worlds</td>
<td>Just turn up</td>
<td>Lecture Theatre C</td>
<td>46</td>
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<tr>
<td>11:30</td>
<td>11:45</td>
<td>Cilia Flashmob</td>
<td>Just turn up</td>
<td>Plaza</td>
<td>32/85</td>
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<tr>
<td>11:30</td>
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<td>Light Express</td>
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<td>Lecture Theatre A</td>
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<td>People Like Me</td>
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<td>Observatory</td>
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*This year most tickets will have been booked in advance, but there will be limited entry on the door - first come first served

**Spaceship Earth**

We fly through space at thousands of miles an hour on the surface of a planetary spaceship. We may not be able to steer this spaceship (which is just as well because we don’t want to crash into the Sun!) but we are able to change some important properties that we, and all life, on Earth depend on. Find out how by coming to this talk that will feature rocket videos, experiments, and the opportunity to try on SCUBA diving kit. Great for everyone.

**Bubble Acoustics - from whales to other worlds**

Gas bubbles in liquids have an extraordinary ability to interact with sound fields. This has been used at Southampton to produce award-winning research and inventions in engineering, biomedicine, oceanography, physics and acoustics. The story starts with the discovery that the sound of a babbling brook comes from bubbles. It moves on to show how the sounds produced by bubbles in the ocean help us understand the global carbon budget. Whales and dolphins adapt their acoustic calls to enhance their ability to catch prey in ‘bubble nets’. Bubbles activated by ultrasound can assist industrial processing, or aid medical diagnosis and therapy, or the design of probes for other worlds. This talk will cover these phenomena and the inventions produced at Southampton as a result.

**Cilia Flashmob**

Cilia are slender hairlike structures found on almost every cell in our bodies. Help us make a giant model of cilia in action by joining our flashmob at 11.30 outside Bldg 85.

**Speakezee+**

Three fantastic researchers will engage you in their fascinating work and give you an insight into the ups and downs of their personal journeys as scientists.

**Einstein’s Secret Universe**

Einstein was a clever chap, and predicted all sorts of weird and wonderful things. In this popular talk, I will describe the last of his great predictions to be tested, involving gravity, lasers, and even black holes!

**People Like Me**

Explore how your daughter can be happy and successful at work: A workshop for Parents and Daughters.
The Oceanography of a Smart Phone
Most of the metals we need to manufacture smartphones have their origin in the ocean. In this presentation, I will explain the constituents of a useful item of daily life such as a smartphone, and where these ingredients come from.

Headfirst to Success!
Understanding how an athlete interacts with their equipment and how to achieve their best performance. A focus will be on the winter sport skeleton where ‘sliders’ descend headfirst down a bob sleigh track achieving speeds up to 140km per hour. The University’s Performance Sports Engineering Laboratory has been supporting British Skeleton since 2006. With Professor Stephen Turnock, Director of the Lab.

So you want to be a Marine Biologist?
Marine Biology is a popular subject and there are lots of ways of getting involved; we explore the various options open to everyone from beach surveys to degree programmes, there is something to suit everyone’s interest.

Volcanoes, Robots and Submarines
Learn how geologists investigate the fiery birth and death of the ocean floor.

Oceans and wild, weird weather
UK weather is strongly linked to conditions across the Atlantic Ocean. Big changes out in the Atlantic may explain the wild and weird weather that we have experienced in recent years.

Waves across the Ocean
How do waves work, how do we study them and what turns a wave into a rogue wave? The audience will become the waves that help answer these and other questions on the force of nature that batters our coastline.
Activities on Highfield Campus

Most activities are suitable for everyone. Where indicated, some activities are particularly well-suited to primary or secondary age groups.

Building 7

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<tr>
<th>Activity</th>
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<th>Description</th>
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<tbody>
<tr>
<td>Custard rolling</td>
<td>Great for everyone</td>
<td>Get your hands into cold custard and find out its surprising properties. Watch it dancing on top of a loudspeaker!</td>
</tr>
<tr>
<td>Railway model</td>
<td>Great for everyone</td>
<td>Oo gauge railway model showing the range of engineering skills that go into building, maintaining and operating a modern railway.</td>
</tr>
<tr>
<td>1½ scale railway competition locomotive</td>
<td>Great for secondary age group</td>
<td>This 1½ scale locomotive weighing nearly half a tonne is being built for a national competition in July. Last year Southampton was the top university entry. The judges will be looking for energy storage, traction, ride comfort, noise and maintainability.</td>
</tr>
<tr>
<td>Joule Bar - Energy for Development: Modelling energy access in rural communities</td>
<td>Great for primary age group</td>
<td>Interact with our solar power simulator, charge your phone and learn about the appropriateness of solar photovoltaics (PV), and the challenges for the supply of electricity to rural communities in Africa.</td>
</tr>
<tr>
<td>EDMC Workshops – Manufacturing</td>
<td>Great for everyone</td>
<td>Manufacturing and machinery demonstrations utilising cutting edge machine tools and equipment.</td>
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Building 15, 17, 19 and 20

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<thead>
<tr>
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<tbody>
<tr>
<td>Sounds Good To Me!</td>
<td>Great for everyone</td>
<td>Experience the strange environments of an anechoic and a reverberation chamber. Have a play with some acoustic toys and see if you can understand how each produces sound.</td>
</tr>
<tr>
<td>Tour of 6-axis shaker</td>
<td>Great for everyone</td>
<td>Visitors can tour the vibration chamber in Building 19 to see the facilities used to study vibration and transport comfort.</td>
</tr>
<tr>
<td>RJ Mitchell Wind Tunnel Tour</td>
<td>Great for primary age group</td>
<td>Explore the wonderful RJ Mitchell Wind Tunnel in action and get to learn how to be a wind tunnel engineer with the University’s Road Cycling club.</td>
</tr>
<tr>
<td>Human Flight - wingsuit challenge</td>
<td>Great for everyone</td>
<td>Join our world record breaking Icarus Wingsuit Team in building and flight-testing your own ironman like wingsuit to soar through the stratosphere. Learn from our team how they plan to break numerous world records in human flight.</td>
</tr>
<tr>
<td>High Voltage Lab</td>
<td>Great for everyone</td>
<td>Will it conduct? Small groups will be taken inside the University’s High Voltage Laboratory and shown a range of experiments that show electricity passing through different materials.</td>
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Archaeology Village (outside Bldg 7)

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<tbody>
<tr>
<td>Keeping cave man warm: turning animal furs into clothing</td>
<td>Great for everyone</td>
<td>For thousands of years, humans kept warm by dressing in the furs and hides of animals they had hunted. Come and learn how prehistoric people used science to solve this most basic of survival challenges during the last ice age.</td>
</tr>
<tr>
<td>Prehistoric metallurgy: smelting bronze age weapons</td>
<td>Great for secondary age group</td>
<td>This smelting demonstration will use a simple charcoal-fuelled firing pit and valveless skin-bag bellows to melt oxidised copper and tin minerals. Come and watch the molten metal being poured into stone casts for the manufacture of Bronze artefacts.</td>
</tr>
<tr>
<td>Tools through time: 2 million years of technological innovation</td>
<td>Great for everyone</td>
<td>This event traces the origins of the axe through time from flint axes to Bronze age, Iron age, Viking and medieval examples. Come and handle the replicas and watch our Flint Knapping demonstrators as they manufacture a handaxe while you watch!</td>
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<td>How to Cross a River with a Cow: Floats, Rafts &amp; Boats from Prehistory to Now</td>
<td>It is 10,000 years ago and our Neolithic ancestors want to trade cows across a river. Do they use a float, a raft or a boat to move the cows? Come build one of each &amp; find out!</td>
</tr>
<tr>
<td>Meet the Ancestors: Life and Death in Medieval Southampton</td>
<td>Come and investigate a real 14th century skeleton, and try to decipher how he lived and died. Using osteological skills, learn how archaeologists investigate skeletal remains to create biographies of people from the past.</td>
</tr>
<tr>
<td>Build A Burial</td>
<td>Understand how archaeologists unravel the puzzle of ancient graves by having a go at building your own burial! ‘Bury’ a skeleton, choose its grave goods, and learn how archaeologists record burials and their finds.</td>
</tr>
<tr>
<td>Seeing beneath the ground with archaeological survey</td>
<td>Remote sensing techniques reveal archaeological remains without digging big holes. Come meet the team that surveyed Old Sarum Iron Age hillfort and have a go using ground penetrating radar, magnetics, and electrical resistivity kit to see what’s under your feet.</td>
</tr>
<tr>
<td>Distinguishing treasure from tatt. Can you spot the real archaeological artefacts among the replicas?</td>
<td>This hands-on activity will demonstrate how archaeologists assess the things they discover to tell how old they are, what the objects were used for, and distinguish the genuinely old from the new.</td>
</tr>
<tr>
<td>Making and Dating Prehistoric Cave Art</td>
<td>While your children mix their very own prehistoric paint from ochre and make paintings in our reconstructed Palaeolithic Cave, adults will learn how archaeologists date prehistoric cave art to discover some of the earliest drawings made by humans.</td>
</tr>
<tr>
<td>Forensics in Action</td>
<td>Chemistry is at the heart of the work of the forensic scientist. In TV shows such as CSI, the forensic scientist is depicted using instruments such as infrared spectrometers to find evidence about crimes. This activity gives you the chance to try your hand as a forensic scientist and to help us to solve a mystery!</td>
</tr>
<tr>
<td>Atoms, Crystals and Diffraction – Probing the Structures of New Materials and Proteins</td>
<td>Crystallography is about growing and examining molecules in crystal form. This allows us to look at details we could never hope to see even with the most powerful microscopes! We show how chemical compounds, materials and biomolecules such as proteins and DNA form crystals. We will show you how to grow your own crystals and how research scientists investigate structure in crystalline materials.</td>
</tr>
<tr>
<td>Making Sense of Chemistry</td>
<td>This activity will focus on the chemistry behind the sense of smell – how do we sense smells and fragrances? How are fragrant compounds synthesised, how isolated from natural products? There will be exhibits and hands-on activities for the public to explore, and staff and students to discuss the underlying concepts.</td>
</tr>
<tr>
<td>Science of Slime</td>
<td>Make the gooiest, slimiest slime in any colour. Make your own potty putty or latex rubber for stretching or bouncing.</td>
</tr>
<tr>
<td>Catalysing the Future</td>
<td>The activity focuses on catalysis, its principles and its applications towards a sustainable future. We explain, using a range of demonstrations and hands-on experiments, how catalysts can affect the properties and the environmental impact of everyday life products: plastics, cars etc.</td>
</tr>
<tr>
<td>Electrochemistry for Energy and Art</td>
<td>The activity will illustrate electrochemical energy storage in principle and practice, with hands-on demonstrations of water electrolysis, “electrochemical painting” (electrodeposition) and redox flow batteries.</td>
</tr>
<tr>
<td>Taking Technology Smaller</td>
<td>A fun introduction to ‘transistors’, the key component in computer chips, and an exciting new way to make these even smaller so that technology such as computers, tablets and mobile phones can do even more.</td>
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This year we are trying out an online interactive map sciengmap.soton.ac.uk
Building 38 (cont’d)

BioBlitz: making species count
Discover an array of insects and minibeasts and learn about the way insect biodiversity supports ecosystem services such as pollination and soil nutrient cycling. Find out how you can take part in this year’s Southampton BioBlitz events this summer, at our Zany Zebra sculpture http://zanyzebras.org.uk/
Great for everyone

Hamphire & Isle of Wight Wildlife Trust
As a conservation charity with nearly 50 nature reserves across Hampshire & the Isle of Wight, we provide information/displays about our Nature Reserves, local wildlife, wildlife gardening, marine projects, and information on how to get involved and support us.
Great for everyone

Wildern School STEM fair Winner
This will be the winners of the STEM fair presenting what they have designed to the general public, explaining its link to STEM.
Great for everyone

Stem cell mountain
Combining the fun of a pinball machine with a profound metaphor for a key biological concept, the stem cell mountain brings to life the complex idea of stem cell potential. This visually impressive and irresistible hands-on exhibit has engaged festival goers at Glastonbury and Bestival, science aficionados at the UK’s top Science Festivals, as well as the 100000+ visitors per year that visit the Winchester Science Centre where it is resident when not on the road.
Great for everyone

Light, Colour & Luminescence
You’ve all seen ‘Finding Nemo’ and the fish that glows in the dark but have you wondered how he does this? Here we will look at things that ‘glow in the dark’ and explain how the materials do this. We look at how the temperature can affect the intensity of the brightness and why this can be useful. From glowing rocks to TV phosphors and light sticks, and even glow in the dark bacteria – we’ll help you see the light!
Great for everyone

The Wellbeing Sanctuary
The wellbeing sanctuary will provide visitors with a set of interactive activities focused on positive lifestyle and behaviour change to promote physical and emotional wellbeing. The accompanying research from our group will also be showcased alongside the activities.
Great for everyone

Cybersecurity
The student cybersecurity society will use personal computers and paper decoding exercises to demonstrate aspects of cybersecurity. Moth Gupta will take a leading role in this activity.
Great for everyone

MadLab
The visitors will build simple (Madlab) electronic kits by soldering.
Great for everyone

Rockets, space & sensors!
321 blast off! Ever wondered about how rockets work? This activity demos the insides of model rockets. Rockets also have sensors in side them - come and learn all about it from our fabulous team.
Great for primary age group

Building 46

Physoc: Magnetism and Nanotechnology
Discover the amazing properties of ferrofluid, a colloidal liquid composed of nanoscale particles that becomes strongly magnetised in the presence of a magnetic field, with these hands-on activities suitable for all ages!
Great for everyone

Building 53

Tours around the Mountbatten cleanroom complex.
See one of the world’s leading research cleanrooms. Talk and tour with the researchers and see the work going on. Includes the optical fibre drawing towers, the integrated photonics cleanroom and the nanofabrication centre.
Great for secondary age group

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Great for primary age group

Building 46

Physoc: Magnetism and Nanotechnology
Discover the amazing properties of ferrofluid, a colloidal liquid composed of nanoscale particles that becomes strongly magnetised in the presence of a magnetic field, with these hands-on activities suitable for all ages!
Great for everyone

Building 53

Tours around the Mountbatten cleanroom complex.
See one of the world’s leading research cleanrooms. Talk and tour with the researchers and see the work going on. Includes the optical fibre drawing towers, the integrated photonics cleanroom and the nanofabrication centre.
Great for secondary age group

Building 38 (cont’d)

BioBlitz: making species count
Discover an array of insects and minibeasts and learn about the way insect biodiversity supports ecosystem services such as pollination and soil nutrient cycling. Find out how you can take part in this year’s Southampton BioBlitz events this summer, at our Zany Zebra sculpture http://zanyzebras.org.uk/
Great for everyone

Hamphire & Isle of Wight Wildlife Trust
As a conservation charity with nearly 50 nature reserves across Hampshire & the Isle of Wight, we provide information/displays about our Nature Reserves, local wildlife, wildlife gardening, marine projects, and information on how to get involved and support us.
Great for everyone

Wildern School STEM fair Winner
This will be the winners of the STEM fair presenting what they have designed to the general public, explaining its link to STEM.
Great for everyone

Stem cell mountain
Combining the fun of a pinball machine with a profound metaphor for a key biological concept, the stem cell mountain brings to life the complex idea of stem cell potential. This visually impressive and irresistible hands-on exhibit has engaged festival goers at Glastonbury and Bestival, science aficionados at the UK’s top Science Festivals, as well as the 100000+ visitors per year that visit the Winchester Science Centre where it is resident when not on the road.
Great for everyone

Light, Colour & Luminescence
You’ve all seen ‘Finding Nemo’ and the fish that glows in the dark but have you wondered how he does this? Here we will look at things that ‘glow in the dark’ and explain how the materials do this. We look at how the temperature can affect the intensity of the brightness and why this can be useful. From glowing rocks to TV phosphors and light sticks, and even glow in the dark bacteria – we’ll help you see the light!
Great for everyone

The Wellbeing Sanctuary
The wellbeing sanctuary will provide visitors with a set of interactive activities focused on positive lifestyle and behaviour change to promote physical and emotional wellbeing. The accompanying research from our group will also be showcased alongside the activities.
Great for everyone

Cybersecurity
The student cybersecurity society will use personal computers and paper decoding exercises to demonstrate aspects of cybersecurity. Moth Gupta will take a leading role in this activity.
Great for everyone

MadLab
The visitors will build simple (Madlab) electronic kits by soldering.
Great for everyone

Rockets, space & sensors!
321 blast off! Ever wondered about how rockets work? This activity demos the insides of model rockets. Rockets also have sensors in side them - come and learn all about it from our fabulous team.
Great for primary age group
Building 56

*Helicopters, Jelly Beans, and experiments with numbers*
Can we use the power of numbers to find out more about the world? We’re experimenting with Jelly Beans, Circles, and paper helicopters, to show how statistics and mathematics make science possible. **Great for everyone**

*Catching the wave*
On the 11 February it was announced that scientists had managed to catch gravitational waves from colliding black holes. In this exhibit you will find out more about this exciting discovery and learn how Einstein’s flexible space and time help us understand the dark side of the universe. **Great for everyone**

*Packing a Ferry*
How should you pack a ferry to fit as many vehicles as possible? If they each cost different amounts, how do you then choose which to let on? In this paper-based activity you get to choose a ferry and see how close you can get to the best solution. This kind of problem is one that the Operational Research group looks at all of the time. Come and talk to us and find out what else we’re working on at the moment. **Primary age group onwards**

Building 59

*Come and Make your own Jelly Microchip!*
Have a go at making your very own microchip out of Jelly! Discover the fun behind micro-fluidics. Other exciting activities include 3D microscope images, live microscope interactions and colouring-in of real micro-electronics. **Great for everyone**

*Lightwave*
We will be demonstrating a number of fun, stimulating and intriguing experiments and activities to showcase the history and state of the art technology of photons. **Great for everyone**

Building 67

*Breathing Pattern Matters: a demonstration of new technology for measuring breathing*
We will be providing a demonstration of a new contactless breathing pattern measurement technology called ‘Structured Light Plethysmography’ (SLP), which measures breathing patterns by shining a light on the front of the chest. We plan to provide a demonstration of the technology and project a recording of the data onto a large screen to demonstrate some of the differences between normal and abnormal breathing patterns. **Great for secondary age group**

*Mars bar bridge building challenge*
Build a bridge to span a 40cm gap using 4 sheets of A4 paper and 1m of Sellotape. Then test it to destruction by loading mars bars into a bag suspended from it. How much weight can it take and can you beat the record? **Great for everyone**

*Wearable e-textile for stroke rehabilitation*
Activities for children: brain colouring, brain anatomy Activities for the adults: quiz, live demo for muscle stimulation. Activities for all: sample display (traditional hydrogel electrode vs. wearable fabric electrode), animation. **Great for everyone**

*Programming Robots*
Come along and have fun programming a robot to complete a set of exciting challenges! **Great for everyone**

*Maths on the move*
Driving by numbers! This activity will get you hands on with how safety systems work in cars. Have a go at making decisions to enable a safe journey when you travel by car. This activity is for anyone interested in numbers, programming, transport, safety and decision-making. **Great for everyone**

*Healthy Computer Games!*
Come and play a computer game about healthy living! What can you learn from playing this computer game about how to be healthy? This activity is great for everyone who likes computer games but also wants to learn about living a healthy lifestyle. **Great for everyone**

*Erica the Rhino*
The famous electronic rhino! Newly updated! Come and see what she can do with Raspberry Pi’s and see if you can make her fart! You might even learn a bit of programming as well! **Great for everyone**

*Compu1ng at Schools: give programming a go!*
Computing at Schools is a great initiative to get schools to teach coding. It has access to resources and demos. They will be showcasing demos such as Microbit! **Great for everyone**

Building 67 (cont’d)

*Futureworlds: technology of the future!*
The Futureworlds stand will give you an insight of the type of technology that is produced from research. This literally is the technology of the future. This stand will be demoing a motion capture device called SharkStream & will give you an insight into how it works. **Great for everyone**

*Wearable Technology: Smart Fabric musical instruments.*
Come and see what smart fabric can do - we have printed musical instruments on to fabric so you can have a go. This is the future of fashion! Come and see how fabric will change the way you view fashion and style. **Great for everyone**

*3D Printing*
We will present the 3D Printing and 3D scanning activities in UoS. **Great for everyone**

*How can we make fuels from rubbish?*
Robogals Southampton is a student-run organization that aims to increase female participation in STEM through fun and educational initiatives. We will have a demosational of our robots in action and one-to-one sessions for kids to have a go programming the robot. **Great for everyone**

*Feel the Noise*
Feedback is important in musical performance – through hearing the sound, but also through sight and touch. Here you will be able to play virtual musical instruments on computer with different types of tactile feedback and can experience the instruments in different ways. **Great for everyone**

*Hands on Sound*
AHRC funded “Hands on Sound” is a collaborative project with the London Sinfonietta and Sound Intermedia, exploring optical motion capture systems for sound processing in live music performance. Here you will be able try one of these systems for yourself. **Great for everyone**

*How our ear works*
This demo will show what happens inside our ear when we hear sounds at different frequencies: 1) listen to pure-tone excitation at low, middle and high frequencies, 2) listen to music and 3) motion patterns inside at micrometre level. **Great for everyone**

*Stepping Across Sound Zones*
SoundField Control Through Hemis-Cylindrical Loudspeaker Arrays With Multiple Listening Zones For Public or Personal Audio Applications. **Great for everyone**

*Visualising Vibrations*
Wave propagation along a cord is shown. People tune the stiffness of one end of the cord to observe characteristic modes of the vibration. **Great for everyone**

*Interactive Music Box*
A simple helmholtz resonator where the user has to tune the frequency of a speaker to meet the resonant frequency of the cavity and observe an outgoing flow. **Great for everyone**

*Ultrasonic Particle Levitation*
What seems like magic is actually the manipulation of the position of particles using sound. **Great for everyone**

*Starstream Ultrasonic Cleaning*
With water, bubbles, and a dose of sound you can clean like magic. We trap bubbles with sound, force them into cracks, and make them shimmer and scrub. **Great for everyone**

*Binaural Dummy Head*
Experience a surreal switch of your aural senses and learn how we locate sounds. **Great for everyone**

*Bloodflow Measurement with Doppler Ultrason*<ref>sound</ref>
A portable Doppler ultrasound system will be used to demonstrate bloodflow measurement, and images used to illustrate how ultrasound is used to see inside the body. **Great for everyone**

*How to help people with hearing loss*
An insight in how the ear transmits sounds to the brain and interactive tutorials on hearing loss and how current hearing aids or cochlear implants improve hearing. Hearing tests using video-audiometry might be available. **Great for everyone**

*Getting a Grip*
Interactive Tribology demonstration equipment will allow visitors to perform simple scientific experimentation to examine the everyday: grip, slip and wear. The audience will increase their understanding of how materials behave, and how friction, wear and lubrication affect our everyday lives. **Great for everyone**
### Railway Noise & Vibration
Lego trainset and buildings demonstrating transmission of vibration into buildings. Including other demos of environmental and transport noise. Great for everyone

### The Human-Powered Submarine
Design a submarine. See what it’s like to be a submarine pilot. Test your engineering skills by building a transmission system using 3D-printed components. Winners of our competition will get to choose the name for a future submarine! Great for everyone

### Engine Mount Demonstrator
An easy to understand model for the demonstration of engine vibration isolation in cars. Great for everyone

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### Building 85 (cont’d)

### Outside

### Transportation Research Group showcase
Find out about the work of one of the UK’s leading centres for transport-related teaching and research. Great for everyone

### Science Buskers
Our science buskers will entertain and inform you at the bus stop, or around and about on campus. Great for everyone

### Rocket Launch!
Come and see real (well not real) rocket launches - every hour. Great for everyone

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### Activities on Boldrewood Campus

### Building 175

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
<th>Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Our planet, your future</strong></td>
<td>Why study Ocean and Earth Science? Make a global impact on the most pressing scientific questions of our age, using interdisciplinary science, and experience unique facilities and fieldwork opportunities.</td>
<td>Great for secondary age group</td>
</tr>
<tr>
<td><strong>UoS Ultimate Autonomous Sailing Robot</strong></td>
<td>UoS Sailing Robot team is currently building the ultimate autonomous sailing robot for the World Robotic Sailing Championship 2016. The goal of the team is to stimulate the development of autonomous marine robotics. The team will have a stand presenting its work and answering questions from visitors.</td>
<td>Great for everyone</td>
</tr>
<tr>
<td><strong>Sour seas: how does carbon dioxide affect our oceans?</strong></td>
<td>A huge portion of the carbon dioxide produced from burning fossil fuels has been absorbed by the oceans - but there’s a price to pay. See for yourself how the changing chemistry of the oceans may affect marine life worldwide.</td>
<td>Great for everyone</td>
</tr>
<tr>
<td><strong>Sediment Dynamics : from the beach to MARS</strong></td>
<td>A range of interactive displays focused on sediment dynamics: wave tank and miniflume demonstrate changes in a sandy beach profile under different wave conditions, and in bedforms under currents, meandering stream table and x-box game to land Rover on Mars.</td>
<td>Great for everyone</td>
</tr>
<tr>
<td><strong>Lloyd’s Register’s World of Ships</strong></td>
<td>The stuff we use has been shipped all over the world. Without ships half the world would starve to death and the other half would freeze to death. Find out more about the amazing world of shipping with Lloyd’s Register.</td>
<td>Great for everyone</td>
</tr>
<tr>
<td><strong>How do you find an earthquake?</strong></td>
<td>Come and see if you can locate earthquakes in East Africa using seismograms.</td>
<td>Great for everyone</td>
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<tr>
<td><strong>Panning for gold</strong></td>
<td>Ever wanted to join the gold rush? Can you find a fortune? Come and try your hand at panning for gold. How much does nugget weigh?</td>
<td>Great for everyone</td>
</tr>
<tr>
<td><strong>Fossil Frenzy</strong></td>
<td>Come along and investigate the past! Explore ancient animal fossils, see how gaint marine reptiles moved, finger paint a dinosaur and create your very own pterosaurus.</td>
<td>Great for everyone</td>
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### Building 176

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<thead>
<tr>
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<tbody>
<tr>
<td><strong>Minecraft Engineering</strong></td>
<td>If you love Minecraft... want to learn more, want to learn about redstone and maps then this is the activity for you. Come and work through some activities with our Minecraft experts and see some things in Minecraft only done here at the University of Southampton.</td>
<td>Great for everyone</td>
</tr>
</tbody>
</table>

### Building 185

<table>
<thead>
<tr>
<th>Activity</th>
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</thead>
<tbody>
<tr>
<td><strong>The Hydrodynamics of Plesiosaurs</strong></td>
<td>A small version of an experiment that is investigating how plesiosaurs, which are extinct marine reptiles, used to swim.</td>
<td>Great for everyone</td>
</tr>
<tr>
<td><strong>The Science of Ships</strong></td>
<td>Activities include: practical demonstrations of ship motions in waves in the brand new 140m towing tank; hands on activities demonstrating ship hydrostatics and stability; examples of Autonomous marine vehicles.</td>
<td>Great for everyone</td>
</tr>
<tr>
<td><strong>Fluid demonstration 1</strong></td>
<td>What happens when we drop a raw egg from a large height onto a non-Newtonian fluid. Will the egg break?</td>
<td>Great for everyone</td>
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<tr>
<td><strong>Fluid demonstration 2</strong></td>
<td>See some fascinating fluid structures using a flow visualisation technique.</td>
<td>Great for everyone</td>
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### Outside

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<tr>
<td><strong>Meet a Dalek!</strong></td>
<td>A full-size replica of the gold Dalek from the recent BBC television series of Doctor Who.</td>
<td>Great for everyone</td>
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<tr>
<td><strong>Unmanned aerial vehicles (UAVs) – mobile command, control, and communications vehicles</strong></td>
<td>Try to (virtually) control a UAV with our flight simulator.</td>
<td>Great for everyone</td>
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<td><strong>Transportation Research Group showcase</strong></td>
<td>Find out about the work of one of the UK’s leading centres for transport-related teaching and research.</td>
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<td><strong>Science Buskers</strong></td>
<td>Our science buskers will entertain and inform at the bus stop, or around and about on campus.</td>
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</table>
How did we do?

Please rate the following aspects of the event on a scale from 1 (poor) – 5 (excellent):

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<thead>
<tr>
<th></th>
<th>N/A</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<th>5</th>
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<tbody>
<tr>
<td>Hands-on activities</td>
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<tr>
<td>Open labs/tours/demos</td>
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<tr>
<td>Shows/talks</td>
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<tr>
<td>Range of things to see and do</td>
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<td>Programme/map</td>
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<tr>
<td>Venue/facilities</td>
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Please list up to three memorable moments from your visit today:

1. ____________________________________________________________
2. ____________________________________________________________
3. ____________________________________________________________

Any other comments:

_____________________________________________________________________________________

What was your favourite activity? (Excluding shows/talks/tours)

_____________________________________________________________________________________

Please hand this form into anyone in a white event t-shirt or post in the feedback boxes.

Information provided will only be used for future planning of this event. Thank you for your feedback.