

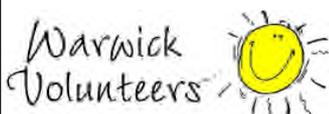
COMPUTING AT SCHOOL
EDUCATE · ENGAGE · ENCOURAGE
In collaboration with BCS, The Chartered Institute for IT

THE UNIVERSITY OF
WARWICK

Sensing Me! Workshop

Scratch 2014, 6th - 9th August 2014

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Technology Volunteers



Outreach workshops designed to encourage young people have a deeper understanding of:

- modern hi-tech products
- relationship between hardware and software
- sensing the world around us

Encourage Creators rather than Consumers

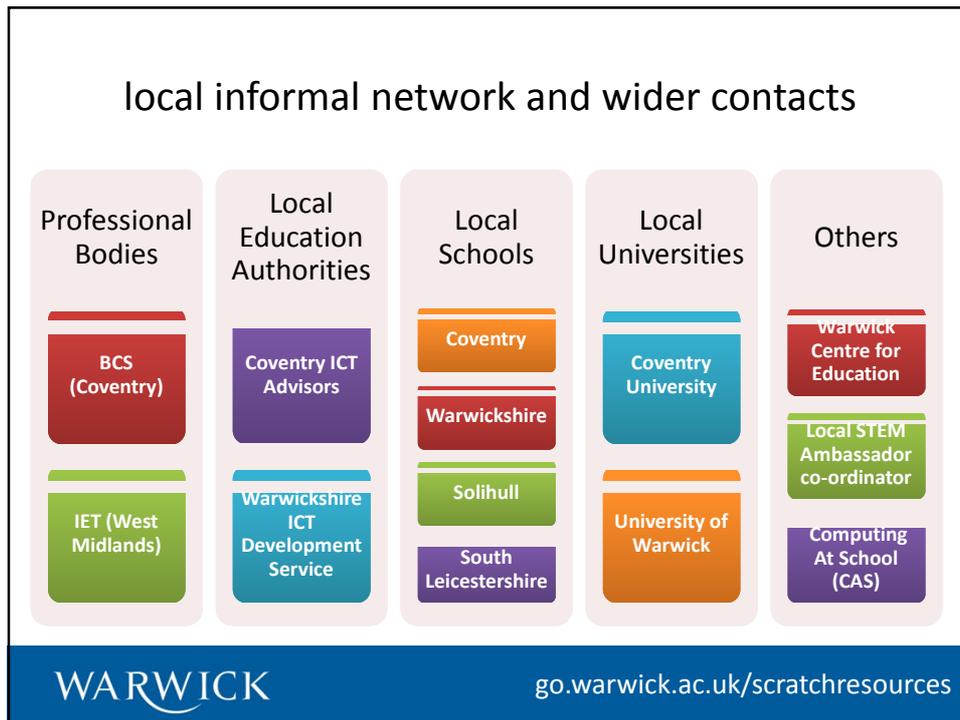
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Who? Students and children work collaboratively

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Why: benefits teachers & children, happens in their classroom

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Why? To encourage a deeper understanding of how things work.

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Where? Schools, local communities & libraries

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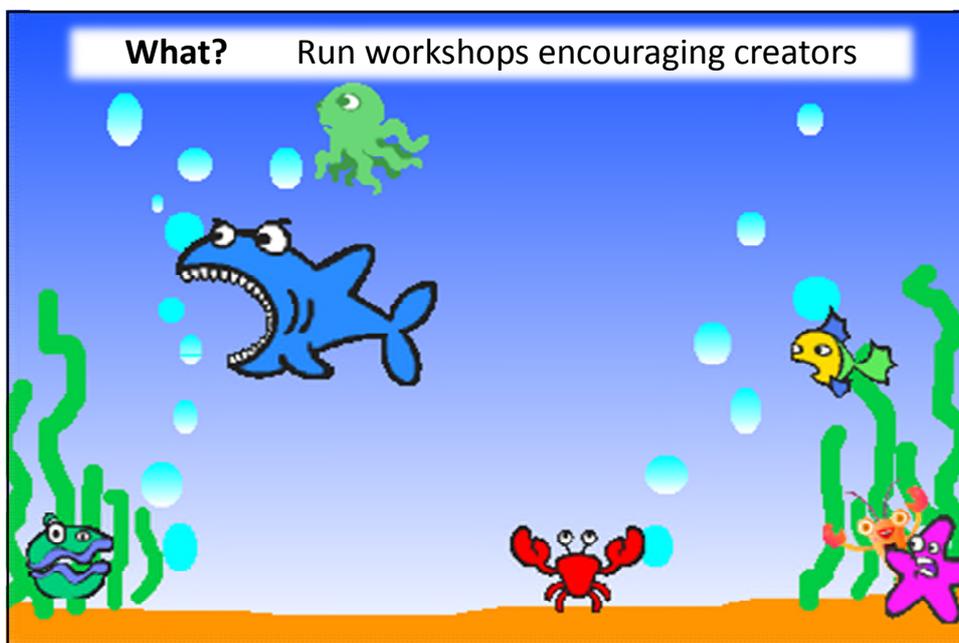
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Who? Led by students at Warwick

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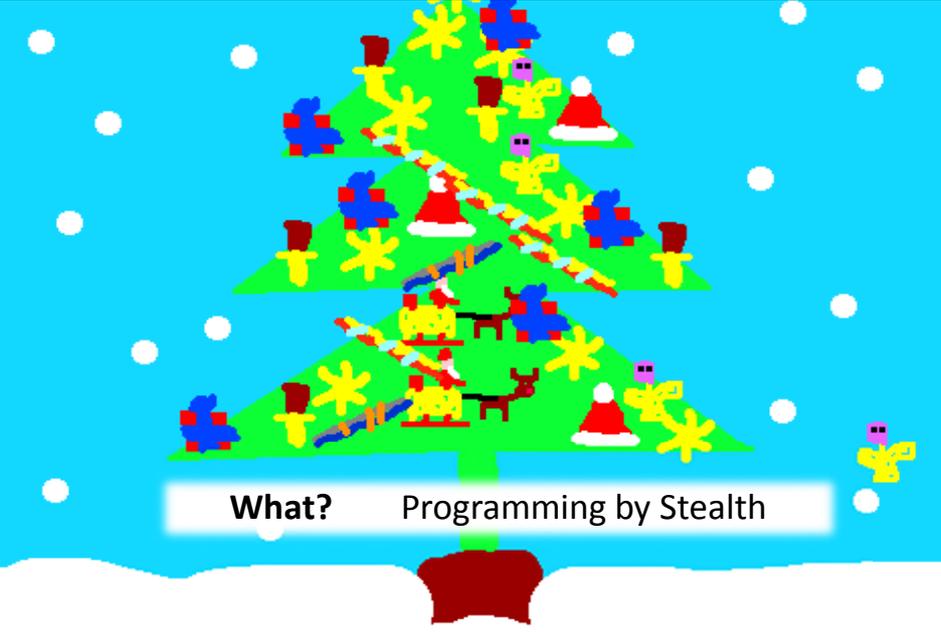
The image shows a group of ten people, including students and staff, standing in front of a large sign for BBC Coventry & Warwickshire. The sign displays the station's name, frequencies (94.8 FM and 103.7 FM), and the website (bbc.co.uk/coventry). The group is diverse in age and appearance, and they are all smiling at the camera. The background is a well-lit indoor space, likely a radio studio or a public area of the station.



What? Run workshops encouraging creators

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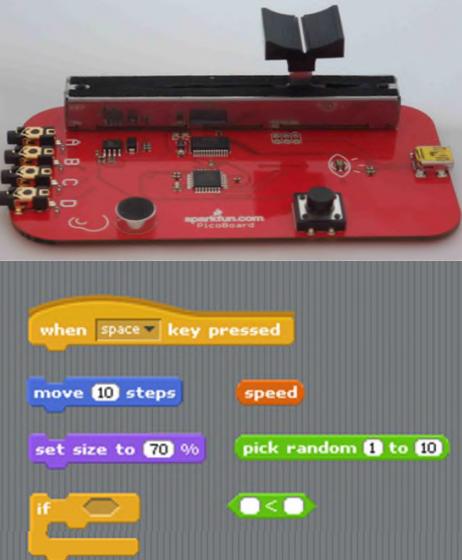
The image is a vibrant, cartoon-style illustration of an underwater scene. The background is a deep blue gradient, with several light blue bubbles floating upwards. In the center, a large blue shark with a wide, toothy grin is swimming. To the left, a green octopus is visible. On the right, a yellow fish with a blue stripe is swimming. At the bottom, a red crab is on the sandy seabed, and a purple starfish is nearby. The overall style is playful and colorful, typical of Scratch-style art.



A Scratch Christmas tree made of green blocks, decorated with yellow snowflakes, red and blue ornaments, and Santa Claus figures. A small yellow butterfly is flying to the right. The background is blue with white snowflakes. A white banner at the bottom of the tree contains the text "What? Programming by Stealth".

What? Programming by Stealth

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A photograph of a young boy in a grey sweater and a man in a blue shirt looking at a red Scratch board. The board is connected to a red microcontroller board (Arduino Uno) with a camera module. Below the photo is a screenshot of Scratch code blocks: "when space key pressed", "move 10 steps", "speed", "set size to 70%", "pick random 1 to 10", and "if" with a "less than" block.

What? Understand links

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Why Sensors?



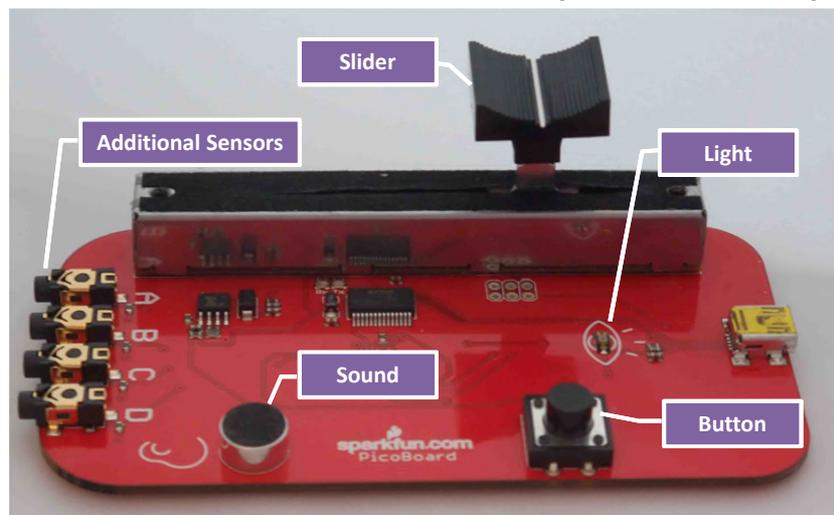
Fun: enhance gaming experience
Useful: sensors in smart phones
Potential: Internet of Things



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Scratch Sensor Board (Picoboard)



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Scratch sprites can respond to

- **Sound**, change how the sprite looks when there is a loud sound.
- **Light**, hide when its dark (or light)
- Others, use the **slider** and **button** to control a character in a video game.



Scratch Versions 1.4 vs 2.0

Picoboards work with:

Scratch 1.4



Scratch 2.0
in development



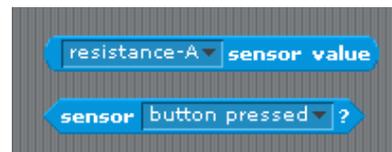
Using Sensors with Scratch

- Sensors return value from 0 ... 100
- Keep reading values from sensor (loop)
- Calibration of sensors



To help –

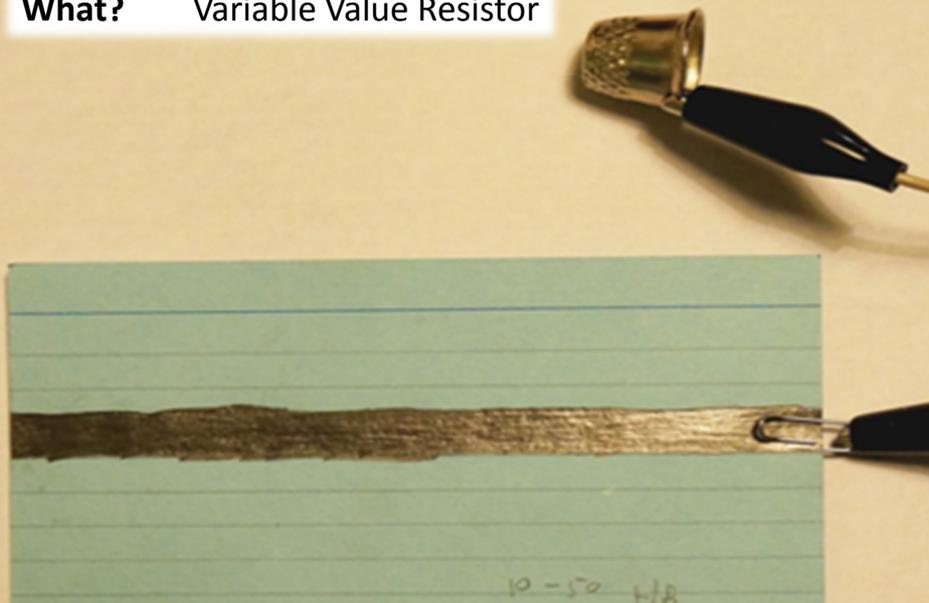
Scratch has the
Scratchboard Watcher



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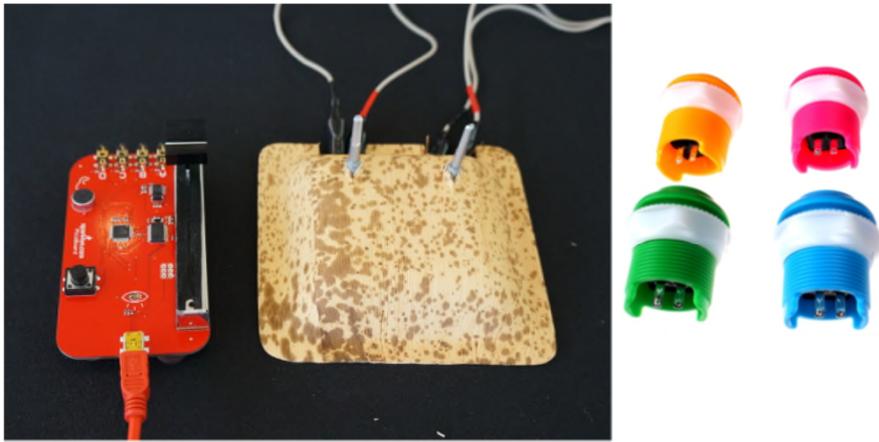
What? Variable Value Resistor



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Buttons & Potentiometers



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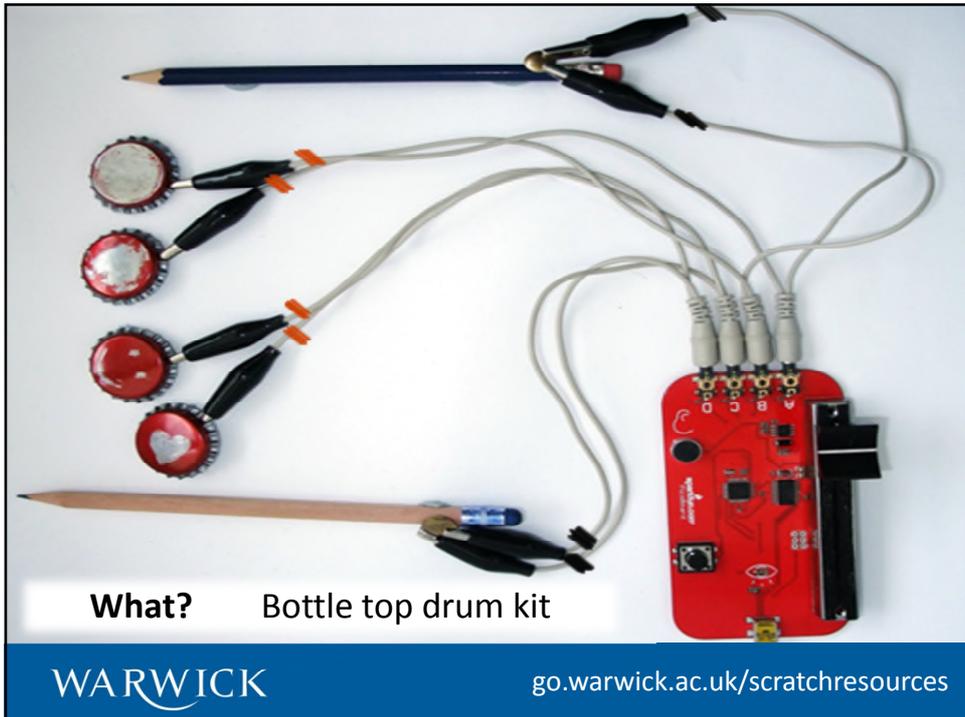
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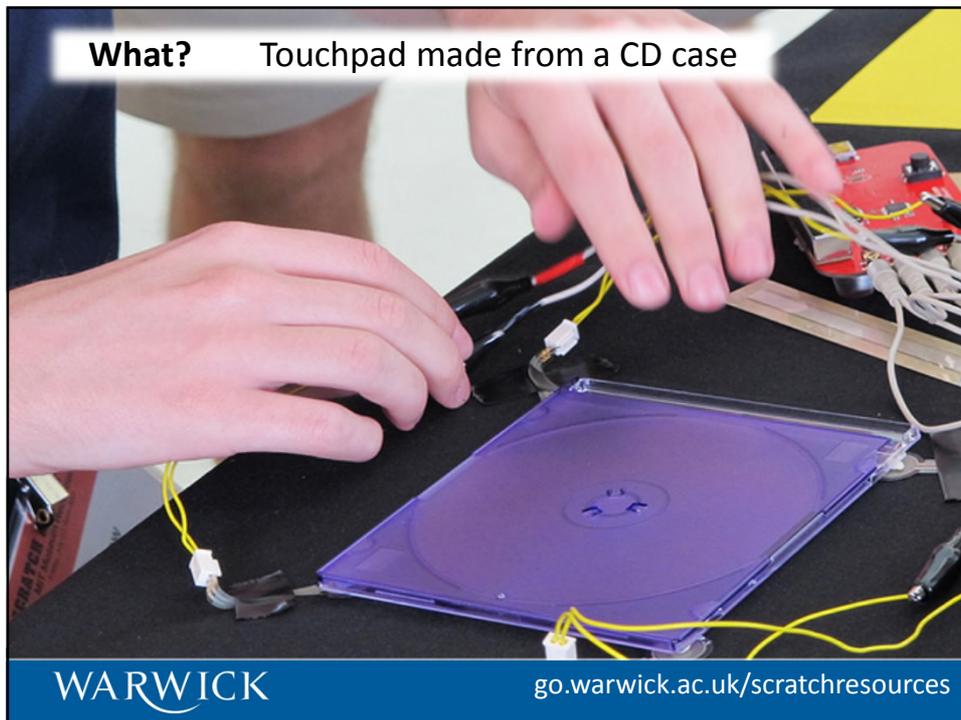
What? Tilt-o-meter



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Sensing Our World, Scratch@MIT2012
worksheets to build sensors
and sample applications

Tilt Sensor

Variable Value
Sensor

Bottle Top
Drums

Buttons &
Potentiometers



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What? Water Bottle joystick



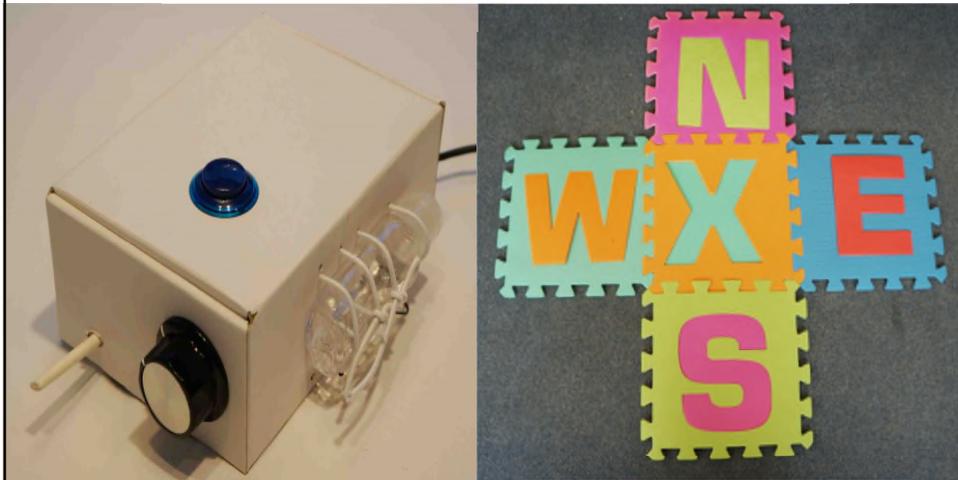
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What? Big Buttons at Fairs & Science events



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Why? Making interfaces is fun!



Box IT! (bop it!)

Dancemat

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Connecting Our World Scratch@BCN 2013 worksheets to build sensors and sample applications

Tiltometer

Box It 2.0

Dance Mat

Button Box



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Today: Sensing Me Workshop

- use Scratch & Sensor boards
- to build fun interfaces & devices
- share ideas for more applications

Lenses



Colour sensor



Breath Measurer



People Counter



Theremin (sort of)



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Today's Challenge: create an application that senses or measures an aspect of a person. Eg: a reaction game



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Now lets make something!



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Thanks.....

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Technology Volunteers

2013-14 Leaders

Tom Preece
Arteesha Bosamia
Matthew Healey
Rohan Singhal

Scratch Team

(Muhammed) Sadeq

Ahmed
Arvis Ancupans
Sae Arakawa
Howie Chau
Michael Clapham
Andrea Contaldo
Adam Coppard
Tom Davis
Beth Fooks
Yuen (Angela) Ho
Wafiq Islam
Vaibhav Kathuria

Ruth King
Timothy Kwok
(Chin Yin) Kevin Kwok
Ho-ming (Martin) Luk
Anais Pirson
Grace Rothwell-Williams
Amitkumar Shah

Fiona Tang
Stephen Tate
Tess Tom
Reza Vahdati
Sarupa Vipulanandam
Jamie Webb
Ben De Ivey



Arduino Team

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Ahmed
Arvis Ancupans
Aleena Baig
Matthew Barwood
Gregory Bull
Michael Clapham
Adam Coppard
James Kohout
Zidong Lin
Stephen Pithouse
Abigail Richardson
Amy Rogers
Rob Sandford
Amitkumar Shah
Balint Vidos
Jamie Webb

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Scott Crowther
Onur Eren

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