

Football and Lego bring seismology to kids



Lucinda Offer

describes the impact of the RAS 200 project Geophysics in a Box, which transforms young football fans into geophysical data collectors.

A new RAS200 project called Geophysics in a Box combines science with sport, a bit of technology, Lego and fun, to get youngsters interested in geophysics and learning how to analyse the data they collect in their own classrooms.

Geophysics in a Box is one of the 12 extraordinary education and outreach projects funded by the RAS to target diverse audiences in celebration of the Society's bicentennial in 2020. Created by three primary organizations – the National Youth Agency, the National Space Centre and the Leicester City Football Club (LCFC) Community Trust – this project shares seismometer kits with football clubs, community groups and schools to measure seismic activity caused by football fans. Paul Denton, seismologist and manager of the UK School Seismology Project for the British Geological Survey, has now also joined the group. Following a pilot programme in Leicester, the project will go on to include Nottingham Forest and West Bromwich Albion football clubs.

Seismometers measure the velocity and acceleration of the ground resulting from an earthquake. The principle has changed little from the first modern seismometer used in 1880, but technology has allowed the sensors to become smaller and the parts easier to manufacture and obtain – so much so that Geophysics in a Box has a kit using off-the-shelf technology such as Raspberry Pi computers and housings made of Lego that school students can build themselves (figure 2).

The Vardyquake

At a football match, the vibrations caused by tens of thousands of fans jumping and shouting to celebrate a goal are strong enough to be detected by seismometers. Student volunteers from the University of Leicester's pilot programme nicknamed the project the Vardyquake, after the home team's top scorer at the time, Jamie Vardy. In 2016, Denton had set up an instrument in a classroom at Hazel Road Primary School half a kilometre away from Leicester City's ground. Proof of principle was given by the tremors that resulted from a goal in the 89th minute against Norwich City, scored by Leicester's Leonardo



1 A mural celebrating Leicester City's Premiership triumph reflects the importance of the crowd – and the Vardyquake in particular – to their success. Note the seismogram at the top.

Ulloa; Vardy's winning streak had by then come to an end. The crowd's excitement at the late winner translated to a magnitude 0.3 earthquake on the Richter scale. The local community even created a mural to commemorate the phenomenon (figure 1).

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“The crowd's reaction to the goal translated to a magnitude 0.3 earthquake”

Not only was this an exciting time for LCFC – who went on to win the Premier League that season – but it was also exciting for the scientists involved. For Denton and the team, the link with a popular sport is an

opportunity to connect with the public and young students. Primary school children get to ask questions and discover things about the world around them; the project is inspiring curiosity about science. Even more valuably, it lets young students ask questions and interact directly with scientists at an age when role models are an important part of creating their future.

The RAS200 team looks forward to the continuing outreach and engagement in geophysics the project will bring as Geophysics in a Box kits and training materials spread to schools across the UK. And, as the InSight mission heads for Mars, where it will land a seismometer in November, perhaps by the time those data become available to the public, we will have primary school scientists primed and ready to analyse the results of a quake from another planet. ●



2 The Lego seismometer connected to the Raspberry Pi data collector.

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MORE INFORMATION

<http://www.ras.org.uk/200>