# Plates for Education – your tile of the sky

## A professional development programme for secondary school teachers

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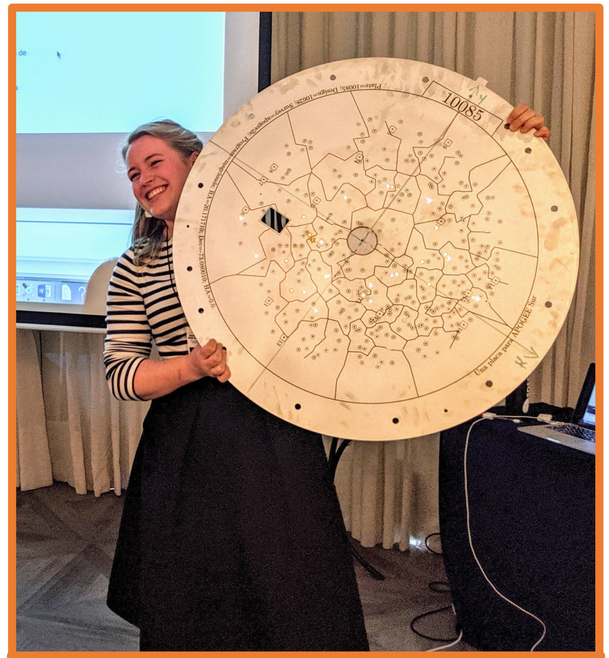
## What is a "Plate"?

The Sloan Digital Sky Survey (SDSS) is an astronomy survey that has been mapping the sky for over 20 years. During that time, SDSS has taken images of billions of astronomical objects (such as stars and galaxies). For a fraction of those – a few million – SDSS has also measured their spectra. That extra step involves guiding the light of the objects from the focal plane of the telescope to the spectrograph, using optical fibers, and this is where plates come in. Plates are large aluminum dishes, where 1000 holes are drilled at exact positions corresponding to the positions on the sky of objects for which astronomers would like a spectrum. Optical fibers are plugged in to each hole and, during observation, they guide the light of the object to be captured by the spectrograph. During each observing night, the survey observes around 7 plates. Over its lifetime, SDSS has drilled and observed tenths of thousands of plates, slowly tiling and mapping the sky. Once the data for the objects on a plate are gathered, that plate is no longer of scientific use.

## What is Plates for Education?

Plates for Education is a program that places retired SDSS plates in schools – each school is given their own unique plate, and training is offered to teachers to guide them through the process of transforming this scientific artifact into a novel and engaging resource for the classroom. Our professional development sessions and resources are based on real hands-on exploration of SDSS data, with a focus on the data associated with each plate - which is unique to each school. Since 2018, we have trained teachers in the US, Chile, Mexico and Scotland.



Former team member and St Andrews undergraduate student Oriel Marshall holding a plate at a teacher training event in Antofagasta, Chile (Nov 2019). Credit: Britt Lundgren. Used with permission.

## This research

Our Ogden Trust funded research project is attempting to quantify and qualify the impact of our professional development sessions on attending teachers. The arrival of large, accessible science datasets, citizen science, and access to research-specific professional development programmes has led to a movement in education where teachers are often empowered through direct engagement with research (Rushton & Reiss, 2019). In Scotland, the introduction of the Curriculum for Excellence has also led to a shift in pedagogic practice and positioning of teachers, as they move from content deliverers to curriculum designers who prefer to contextualize material with contemporary science and links to current research (Wallace & Priestley, 2017). **We want to understand the role of meaningful scientific artifacts (like our plates) in teacher professional development, and the impact of the sessions on teachers in terms of their wellbeing, their identity as Physicists, their confidence and self-efficacy.**

## Project status and progress

We have developed our research methods, questionnaires and interview scripts, and are ready and excited to gather the first data for this research project from teachers attending a workshop that is planned for late 2021 in Scotland.

If you are interested in the project – as a partner organization or as a teacher - please get in touch!

**References and links:**

www.sdss.org

voyages.sdss.org

**Rushton & Reiss (2019)** 'From science teacher to 'teacher scientist': exploring the experiences of research-active science teachers in the UK', *International Journal of Science Education*, 41:11, 1541-1561

**Wallace & Priestley (2017)** 'Secondary science teachers as curriculum makers: Mapping and designing Scotland's new Curriculum for Excellence', *Journal of Research in Science Teaching*, 54, 3, 324-349