

14) Case Studies

1. Looking for the perfect squeak

The work of Prof. W. Briscoe's group in Bristol, in partnership with Procter and Gamble, on surfactants was featured in the [ESRF public outreach](#). This study, which focuses on the physical phenomenon known as stick-slip friction, results in a squeaky noise while washing the dishes. In Japan, this noise is known as 'kyu-kyu' and appears when there is physical contact of the human fingertip sliding across a wet lubricated surface (or dish). You can watch the accompanying video [here](#).



2. Tackling the UK's Plutonium Stockpile Problem

In this study, led by Professor Neil Hyatt from the University of Sheffield Energy Institute and Department of Materials Science and Engineering, the team demonstrates how a glass ceramic material could immobilise contaminated plutonium residues, arising from early research and development activities. Using data taken at XMaS, an extremely bright X-ray microscope at the European Synchrotron Radiation Facility in France, the Sheffield team developed an atomic scale model to understand how chlorine was bonded within the glass. They were then able to determine the solubility threshold for chlorine in the silicate glass material and show that it exceeded the worst-case expectation for the treatment of plutonium residues. The important impact of this work is to show that these plutonium residues could be immobilised within the glass ceramic material, without needing any prior treatment to remove the chlorine contamination. You can read the article [here](#).

3. The Power of X-rays in Materials Science

We have been working with [Futurum](#) to prepare an educational resource/article. The aim of Futurum is to inspire young people aged 14-19 to pursue careers in STEM. We have worked with them to present an overview of the facility and how it is used to explore materials challenges through a collection of science highlights from our users. As well as making the work of the facility accessible, it also includes school-based activities that teachers can use to plan lessons focusing on materials science and the X-ray techniques used to study them. The article will be circulated globally through social media and is an open access resource that will target teachers and school students.

