



## Polarisation – Workshop 24<sup>th</sup> June 2023

Playing with polarised light can be fun and helps to teach us the fundamental principles for using the technique in microscopy.

Something which has caused the ‘Wow’ at children’s displays is the ‘magic duck’. As I usually give away examples, I use pieces of clear packaging to support Sellotape rather than glass slides. Some clear plastic is birefringent, but packaging made by cold moulding rather than stretching is not birefringent. Sellotape is stretched when manufactured so is birefringent with low order polarisation colours and extinction usually along the length. So one layer of tape gives a pale yellow colour, two gives blue and three goes into the reddish shades. The ‘duck’ can’t be seen in normal light but appears (as if by magic) in polarised light. Using a tablet screen and polarising sunglasses makes the ‘duck’ appear or just use simple polarisers on a light table.

At times when there are British teams contesting events, I can also show a birefringent Union Jack.

A reminder that the ‘duck’ needs to be rotated away from its extinction position to  $45^\circ$  unless you use circularly polarised light. This can be demonstrated on the little light table by inserting a  $\frac{1}{4}$  wave plate above the polariser at  $45^\circ$  and another below the analyser at a further  $90^\circ$ . Try it.

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More seriously – polarised light is used extensively in microscopy to identify the components in rocks and minerals. I have a couple of images of a thin section of rock on a slide from the Caffyn collection which is described as a Hornblende Porphyrite. To identify the components a variety of features are used. Colour, shape, cleavage, relief and birefringence. The book I have brought today attempts to help students identify rock components by following a key sequence in a similar form to those used for botanical samples. See if this helps in showing the Hornblende.

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