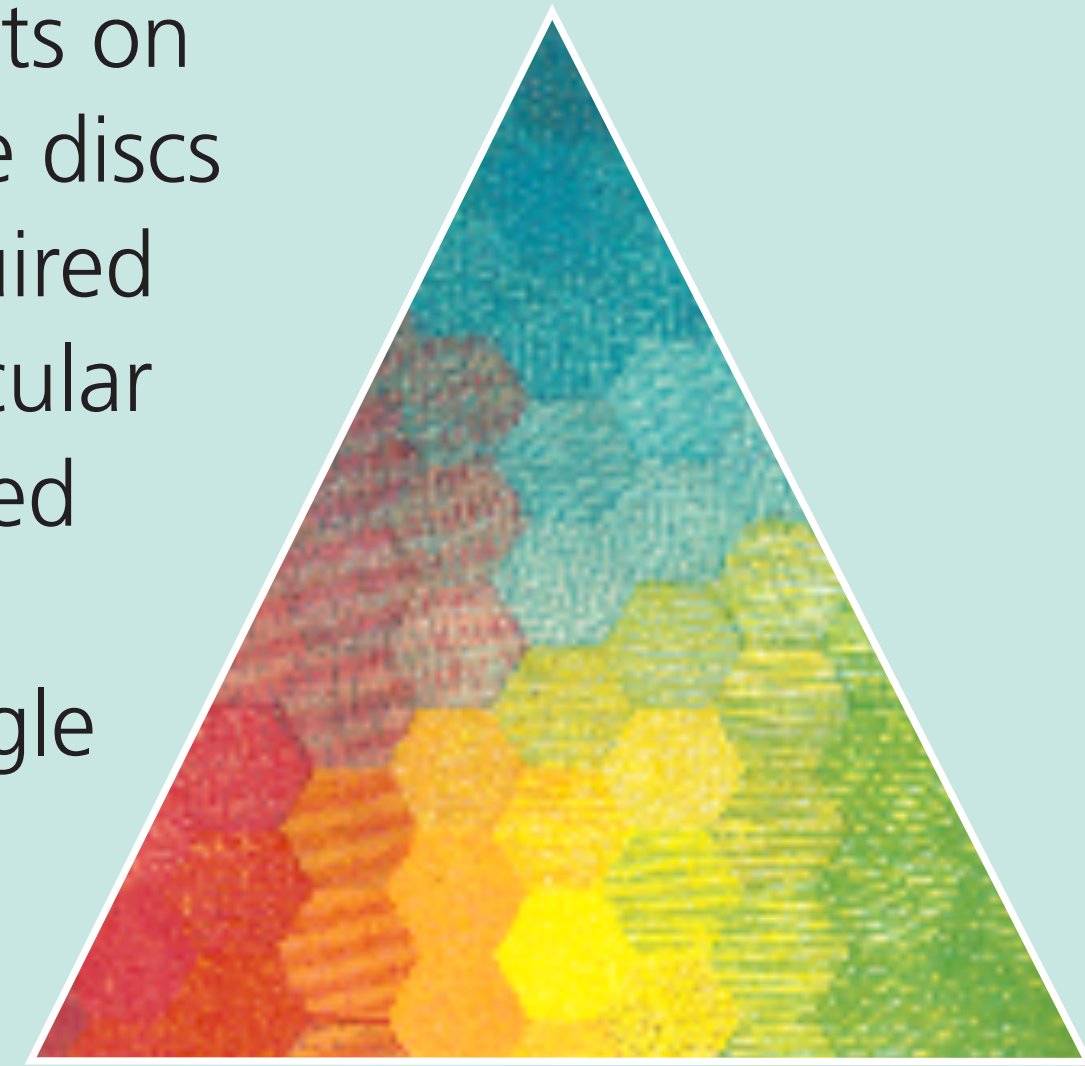


# Colour



Maxwell holding Colour Top, courtesy Master and Fellows of Trinity College, Cambridge.

In the 1850s, Maxwell painted artists' pigments on circular discs of card as his colour sources. The discs were interleaved and adjusted to provide required proportions of colours, then attached to a circular base. When the base was rotated, light reached the eye independently and there combined to produce the perceived "tint". His colour triangle summarized the range of tints by using at the apexes vermilion (red), emerald green and ultramarine (blue) to match the colour sensitivities of the eye.

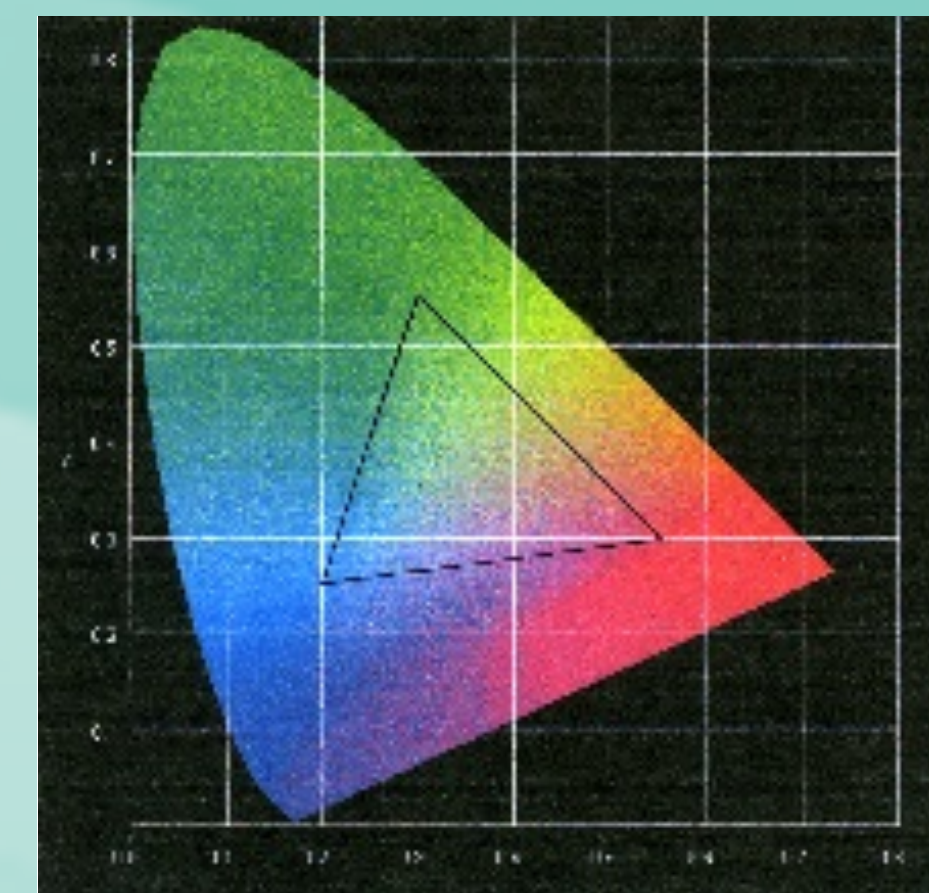


Maxwell's Colour Triangle



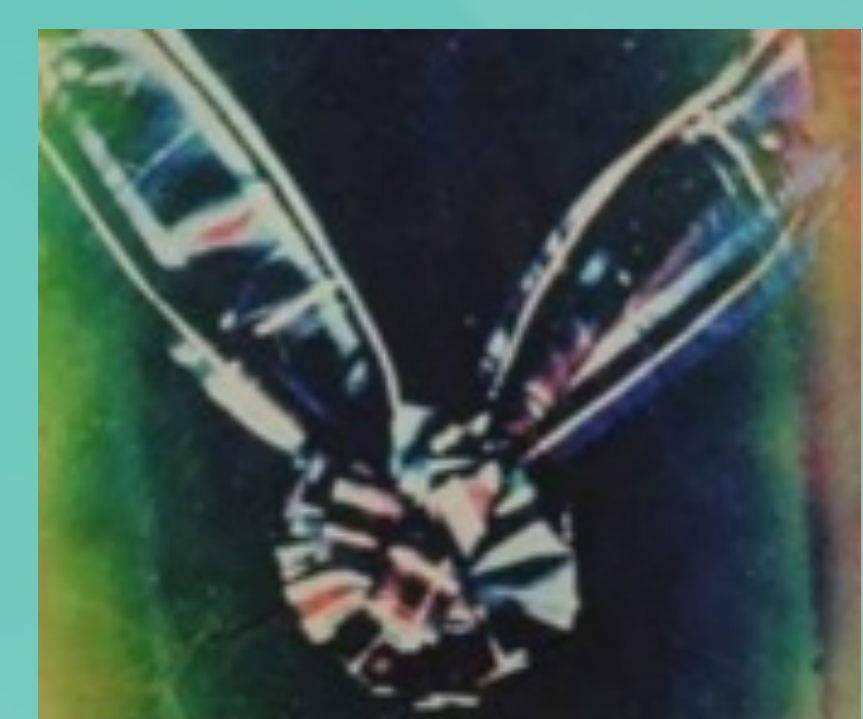
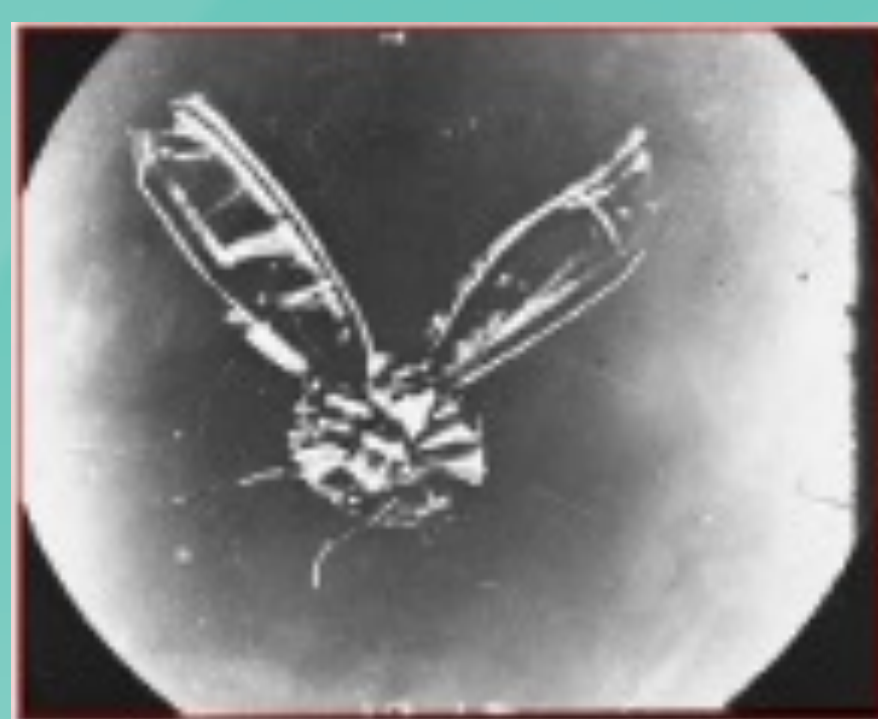
Reproduction of Maxwell's Colour Box with aperture and slits shown in top left.

By 1860 he had transferred this strategy to his Colour Box. From sunlight entering through a side aperture a beam was directed through prisms near one end to produce a full spectrum of colours at the opposite end. In the reverse mode of operation, sunlight was directed back into the box at that end through three slits at positions of the now known colours. From these beams, "by the optical reversal principle", only the retraced paths of the three colour components in the sunlight were returned via the prisms to the side aperture. There the resulting composite of the three chosen colours could be studied. Nowadays the CIE 1931 colour chart (shown with the outline of Maxwell's triangle inside) provides the full colour synthesis.



International Commission on Illumination (CIE) 1931 colour chart.

In 1861 Maxwell demonstrated the first photographically produced colour image using a tartan rosette subject. He had proposed that the colours in a landscape could be recorded "by photography" on three black and white magic lantern slides using blue, green and red filters. Subsequent projection of the three slides through the same filters would, by superimposition, reconstruct the scene in full colour!

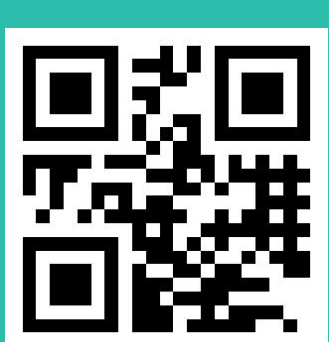
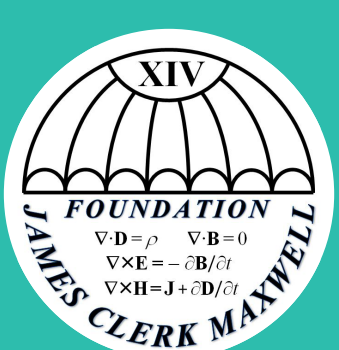


Red, green and blue filtered lantern slides of the rosette.

First ever colour photographic image.

Such colour image production with three colour filters is used today in digital camera, television computer and mobile phone.

The citation on his 1860 Rumford Medal awarded by the Royal Society includes:  
*"for his research on the composition of colours and other optical properties"*.



This panel is sponsored by  
**The School of Physics and Astronomy at the University of Glasgow**

**James Clerk Maxwell Foundation**

