

Did you know that

# James Clerk Maxwell

Scotland's most famous physicist, was responsible for  
**your mobile phone?**

By the 1860s, he had gathered together all the laws of **electricity and magnetism**, and added one of his own. The complete set is still known as **Maxwell's Equations**.

You can apply them anywhere – just add in the electromagnetic properties of materials and solve the equations.



You can use the equations for *radio waves, microwaves, light, X-rays* and all the others of the **electromagnetic spectrum** – something Maxwell predicted.

Sadly he did not live to see even the beginning of the verification of the prediction.

$$\nabla \cdot \mathbf{E} = \frac{\rho}{\epsilon_0}$$

Maxwell's Equations ensure that the transmitter and receiver in your mobile phone are designed to work efficiently - and safely: the waves carrying the messages are guided, with very little leakage.

Between mobiles, the waves travel through the air in much the same way as the many electromagnetic waves in space science: from communication through remote sensing to the latest exploration in the solar system and beyond.

And, for good measure, the imaging technology for the mobile phone screen can be traced back over 150 years to Maxwell's specification.

It was announced to the **Royal Society of Edinburgh** in 1855 and fully written up on their journal, the *Transactions*, in 1857.

Maxwell's specification stemmed from one of his first research interests: how we see coloured light. He developed it to explain how to produce full-colour images on screens using only red, green and blue light, and demonstrated this to an astounded audience at London's Royal Institution in 1861. Maxwell's strategy, adapted to suit modern technology, is all around you – from mobile phone and digital camera screens through colour television to the large display screens in sports arenas and travel terminals.

For a comprehensive account of Maxwell's life and work, why not attend the presentations here in Edinburgh, by **Professor Malcolm Longair on April 14th** and **Dr Basil Mahon on April 28th**. Details are on a leaflet alongside.