Maths Week Ireland

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WIN $1,000,000

AND IMMORTALITY.

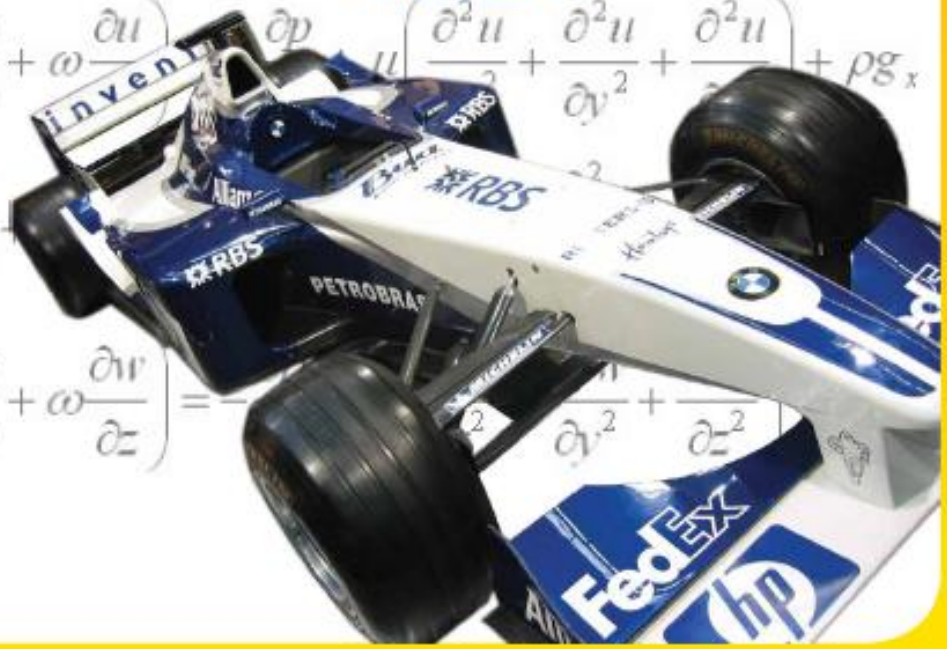
In the first half of the 19th Century the Irish mathematician George Stokes, following on from the work of French engineer Claude Navier, discovered the equations that today are used to describe fluid flow. They are used to model how blood flows through our bodies, how water flows, how the weather works and how air flows over wings of aircraft and around cars. They are also used to simulate water, fire and smoke in computer games.

However these equations have never been solved. The Clay Mathematics Institute is offering $1,000,000 to anyone who can solve them. A solution to the Navier-Stokes equation would almost certainly lead to improvements in the design and efficiency of cars, boats and planes and would bestow mathematical immortality on the person who achieves this. Find out more on www.mathsweek.ie.

$$\rho\left(\frac{\partial u}{\partial t}+u\frac{\partial u}{\partial x}+v\frac{\partial u}{\partial y}+\omega\frac{\partial u}{\partial z}\right)=-\frac{\partial p}{\partial x}+\mu\left(\frac{\partial^2 u}{\partial x^2}+\frac{\partial^2 u}{\partial y^2}+\frac{\partial^2 u}{\partial z^2}\right)+\rho g_x$$

$$\rho\left(\frac{\partial v}{\partial t}+u\frac{\partial v}{\partial x}+v\frac{\partial v}{\partial y}+\omega\frac{\partial v}{\partial z}\right)=-\frac{\partial p}{\partial y}+\mu\left(\frac{\partial^2 v}{\partial x^2}+\frac{\partial^2 v}{\partial y^2}+\frac{\partial^2 v}{\partial z^2}\right)+\rho g_y$$

$$\rho\left(\frac{\partial w}{\partial t}+u\frac{\partial w}{\partial x}+v\frac{\partial w}{\partial y}+\omega\frac{\partial w}{\partial z}\right)=-\frac{\partial p}{\partial z}+\mu\left(\frac{\partial^2 w}{\partial x^2}+\frac{\partial^2 w}{\partial y^2}+\frac{\partial^2 w}{\partial z^2}\right)+\rho g_z$$



George Gabriel Stokes was born in Co. Sligo in 1819 and became the Lucasian Professor of Mathematics at Cambridge (a chair previously held by Isaac Newton and more recently by Stephen Hawkins), holding the office for over 50 years until his death in 1903. He made many important contributions to understanding of the behaviour of light, fluids and in engineering. Craters on both the Moon and Mars have been named after him.