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Michigan Institute for Plasma Science and Engineering

Wednesday
January 13, 2016
3:30 pm
Room 1005 EECS

Prof. Steven Cowley

UK Atomic Energy Authority and Imperial College, London

Reducing the Cost & Scale of Fusion Devices and the Problem of Stability

The projected scale of magnetic fusion power plants is large and certainly not optimum. I will discuss evidence for regimes where plasma turbulence is suppressed and tokamak experiments can achieve fusion performance at modest size. Unfortunately such regimes often terminate abruptly in explosive instability. In ITER such disruptive behaviour would be damaging to the machine and therefore must be avoided. I will discuss the physics of these explosive disruptions, the observations and how we may find stable high performance states.

About the Speaker: Prof. Steven Cowley received his BA from Oxford U. and PhD. from Princeton U. His post-doctoral work was at Culham Centre for Fusion Energy, returning to Princeton in 1987. Prof. Cowley joined UCLA in 1993 rising to Full Professor in 2000. From 2001-03 he led the plasma physics group at Imperial College London where he remains a part time professor. From 2004-08 he was the Director of the Center for Multi-scale Plasma Dynamics at UCLA. He became Director of the UK Atomic Energy Authority's Culham Laboratory in Sept. 2008 and Chief Executive of the UK Atomic Energy Authority in Nov. 2009. Prof. Cowley's main research is realising fusion power. He has published over 150 papers on the origin of magnetic fields in the universe, theories of plasma turbulence and explosive behaviour in laboratory and astrophysical plasmas. Prof. Cowley co-chaired the US National Academy's Plasma 2010 decadal assessment of plasma science. He is a Fellow of the American Physical Society, the Institute of Physics, the Royal Society and the Royal Academy of Engineering; and is the recipient of the IOP's 2012 Glazebrook Medal for leadership in physics. Currently he is a member of the Prime Ministers Council on Science and Technology.