The Institution of Engineering and Technology

Thur 22 Feb 2024 at 7.30pm

FREE ENTRY

Venue
Van Emden Theatre, Edith Morley Building
Whiteknights Campus, University of Reading

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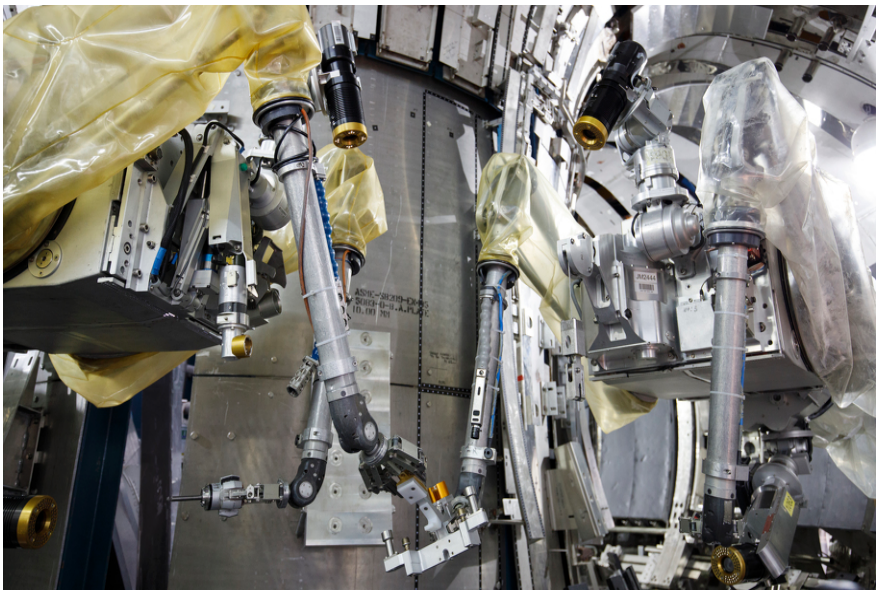
Berkshire

Maintenance Robotics for Nuclear Fusion: Taking electronics where no-one can go at all

Emil Jonasson, UK Atomic Energy Authority

More than 80 per cent of the world's energy still comes from fossil fuels. Climate change and diminishing fuel reserves mean the race is on to find alternative, sustainable technologies to supply a growing global population. With no greenhouse gas emissions, inherent safety features and virtually limitless fuels, fusion has a key role to play in the energy market of the future. In order to realise fusion's potential as a source of efficient, cost-effective and reliable energy, robotic remote maintenance is a mission-critical capability: reliable, fast intervention is necessary to maximise plant availability and hence achieve commercial viability. One of the main challenges of creating such remote maintenance systems is the high ionising radiation present in and around a Fusion powerplant. This talk describes the challenges of deploying electronic control systems in areas which require 1000 times the ionising radiation tolerance of state-of-the-art space components, lists ongoing research in the field of extreme environment electronics, and presents exotic potential solutions such as diamond-based electronics, NEMS devices, and hollow-core optical fibres.



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