

56TH RANKINE LECTURE

Wednesday 16th March 2016 at 5.30pm

The Great Hall, Sherfield Building, Imperial College London, Exhibition Road, SW7 2AZ

Geotechnics and Energy

Professor Richard Jardine

Imperial College London

ABSTRACT

Geotechnical Engineering has matured sufficiently to contribute to some of society's grand challenges. This 56th Rankine Lecture considers the pressing problem of ensuring vital energy supplies while also recognising, mitigating and dealing with the climate consequences of fossil fuel consumption. The Lecture's three main sections report recent geotechnical research relating to these wide ranging topics, illustrating some aspects of each with specific examples from the Speaker's portfolio. The first focuses on research to support offshore hydrocarbon production, considering platform foundations on the continental shelf and large landslide geohazards in deeper water. The second considers research into climate change impacts in warming permafrost regions and engineering to raise flood defences founded on difficult organic soils. The final section reports on current research that is having a major impact on offshore wind turbine foundations and hence renewable energy economics.

The Lecture emphasises that integrating geology and rigorous analysis with advanced laboratory and field experiments is the key to resolving the complex geotechnical problems raised; careful full-scale field monitoring is also essential to checking reliability in practice. A collaborative approach is vital to such multi-faceted research and the contributions of the Speaker's International and British co-workers are recognised throughout the Lecture.



Richard Jardine is Professor of Geomechanics at Imperial College London, where he has been a member of staff since 1981, taking his Chair in 1998. He acted as Head of Geotechnics until 2011, Consul for Engineering and the Business School until 2015 and is currently Deputy Head of Civil and Environmental Engineering.

His research covers offshore geotechnics, soil characterisation, field instrumentation, soft ground engineering, geohazards and climate change impact. He has also consulted on many major onshore and offshore projects and has been an Associate of Geotechnical Consulting Group since 1985. He is a Fellow of the Royal Academy of Engineering, the ICE and the City and Guilds Institute. He has worked as a visiting professor in Singapore, Japan and China and where he is currently a Ministry of Education distinguished overseas scholar at Zhejiang (ZJU) and Wenzhou Universities. He has published over 200 papers and won 17 UK and International research prizes. His named talks include the Geotechnique, Coulomb, Zeng, Bishop and Sowers Lectures.

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