

## Wave Propagation and Soil Stiffness: Particle-Continuum Duality Workshop

organised by Dr Erdin Ibraim and Dr Catherine O'Sullivan

This Workshop aims to enhance understanding of the nature of wave propagation through soils based on both experimental and numerical approaches. The relationship between wave propagation velocity and soil stiffness is largely based on continuum theory, but many response features are a consequence of the particulate nature of the material. The Workshop will challenge the hypothesis that granular materials act as continua at small strain levels. The format of the Workshop is a series of presentations given by invited speakers, with all participants presenting their contributions via posters and in discussion periods. Provisional programme:

### Thurs. 20<sup>th</sup> March: Experimental session

Chair: Prof. Matthew Coop  
City Univ., Hong Kong

Prof. David Airey (Univ. of Sydney, Australia)  
*Wave propagation: experimental insights*

Prof. Xiaoping Jia (Langevin Institute, ESPCI ParisTech, France)  
*Sound propagation in dense granular media*

Prof. Carlos Santamarina (Georgia Tech., USA)  
*Process monitoring using small-strain measurements*

Prof. Jun Yang (Univ. of Hong Kong, China)  
*Shear stiffness of granular material at small strains: does it depend on grain size?*

Prof. Reiko Kuwano (Univ of Tokyo, Japan)  
*Disk-shape piezo-ceramic transducer for elastic wave measurement and its application to sandy soils*

Mr. Simon Hamlin (Univ. of Bristol, UK)  
*Wave transmissions in glass bead assemblages*

Mr. Chris Russell (Russell Geotechnical Innovations UK)  
*Bender elements: a commercial perspective*

Dr. David Nash (U. of Bristol)/Dr. Paul Greening (UCL)  
*Title – tbc.*

### Friday, 21<sup>st</sup> March: Numerical session

Chair: Prof. David Muir Wood  
University of Dundee, UK

Prof. Stefan Luding (Twente Univ., Netherlands)  
*Wave propagation in disordered granular media*

Dr. George Marketos (Utrecht Univ., Netherlands)  
*Analytical and numerical modelling of dynamic soil response*

Dr. Colin Thornton (Univ. of Birmingham, UK)  
*On the true elastic response of particle systems*

Assist. Prof. Vanessa Magnanimo (Twente Univ., Netherlands)  
*Elasticity in anisotropic granular materials*

Prof. Matt Evans (Oregon State University, USA)  
*Simulation of wave propagation in assemblies of (non)cemented spheres*

Dr. John O'Donovan (Buro Happold, UK)  
*The nature of stress waves produced during dynamic testing of soil*

Mr. Sacha Emam (Itasca International Inc.)  
*Correlating damage and acoustic emission monitoring using discrete-element simulations*

Dr. Helen Cheng (University College London, UK)  
*3D DEM simulations of wave propagation through a triaxial granular specimen*



The workshop will start with lunch on Thursday 20<sup>th</sup> of March and finish at lunch-time on Friday 21<sup>st</sup>. During the afternoon of Thursday the focus of the presentations will be experimental research, while on the morning of Friday the presentations will relate to analytical and numerical research. The workshop will be held at the conference facilities of the University of Bristol, Clifton Hill House (Lower Clifton Hill, Clifton, Bristol, BS8 1BX) while the workshop banquet dinner will be organised at the Orangery, Goldney Hall (Lower Clifton Hill, Clifton, Bristol BS8 1BH).

Bristol is a lively, dynamic and creative multicultural city of balloons and kites, festivals and carnivals, architecture and park land, business and new technology, theatres and museums. Brunel, arguably the most famous Civil Engineer of all time, shaped the face of Bristol. Bristol International Airport links with cities and major hubs across Europe and beyond, whilst there is a two hour coach/train transfer from London Heathrow airport or central London.

Thanks to support provided by Itasca International Inc., Russell Geotechnical Innovations and the University of Bristol, the cost of the workshop is £100 for registration before March 1 2014. After March 1 2014 the registration cost will be £120. A discount on registration fees for BGA/ICE members may be available, please email organisers for further details. Preferential hotel room rates in convenient locations have been arranged.

Information on venue locations, access, accommodation and registration (online payment available) can be found at the following website:

<http://www.bris.ac.uk/engineering/events/2013/98.html>

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