

EPSRC-Funded Project:

PARTICLE-SCALE INVESTIGATION OF SEEPAGE INDUCED GEOTECHNICAL INSTABILITY

EPSRC

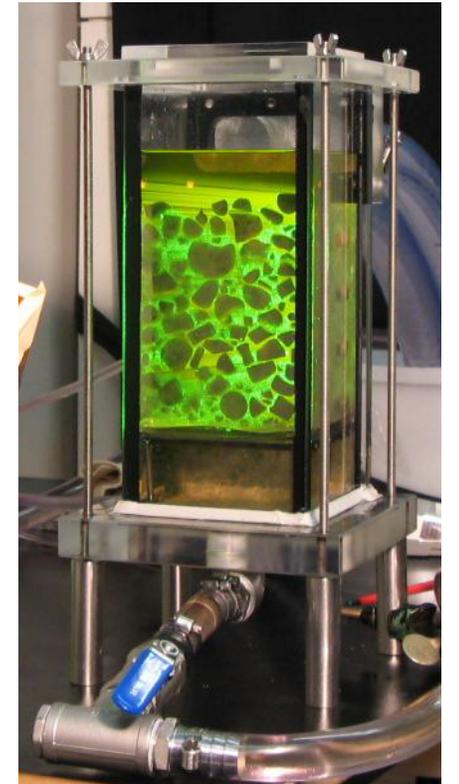
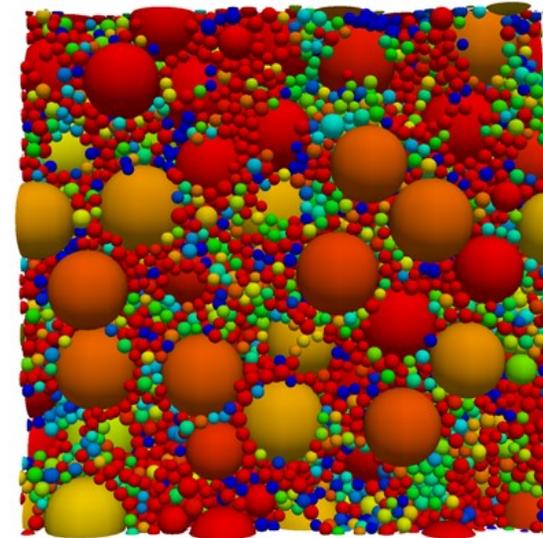
Engineering and Physical Sciences
Research Council



The
University
Of
Sheffield.

**Imperial College
London**

- Collaboration between Imperial College London and The University of Sheffield
- Overall aim is to understand the particle scale mechanisms underlying internal instability
- Imperial College London: Discrete Element Method (DEM) simulations
- University of Sheffield: Permeameter tests on transparent soil



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Project Team

Imperial College London

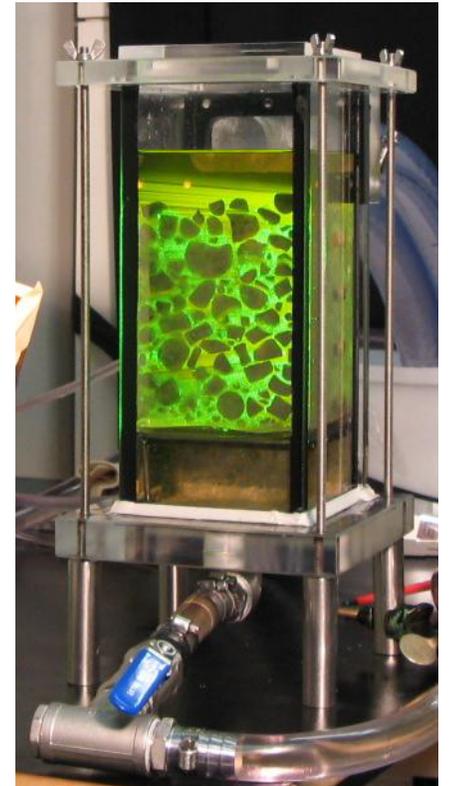
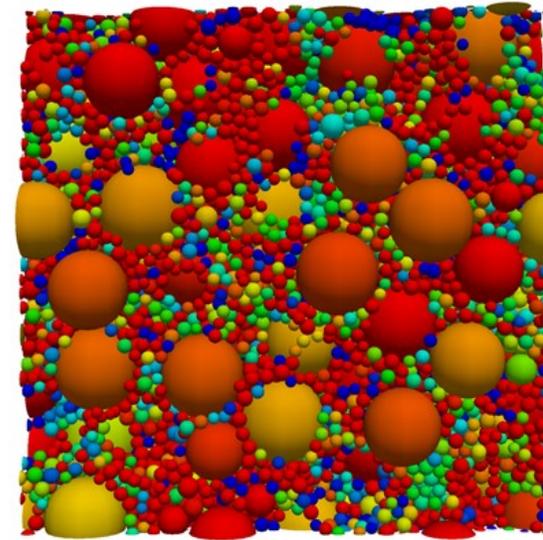
Dr. Catherine O'Sullivan, Dr. Adnan Sufian, Dr. Ed
Smith

+

Dr. Tom Shire (now moved to University of
Glasgow)

University of Sheffield

Dr. Lis Bowman, Dr. Jonathan Black, Dr. Nicoletta
Sanvitale, Mr. Fahed Gaber

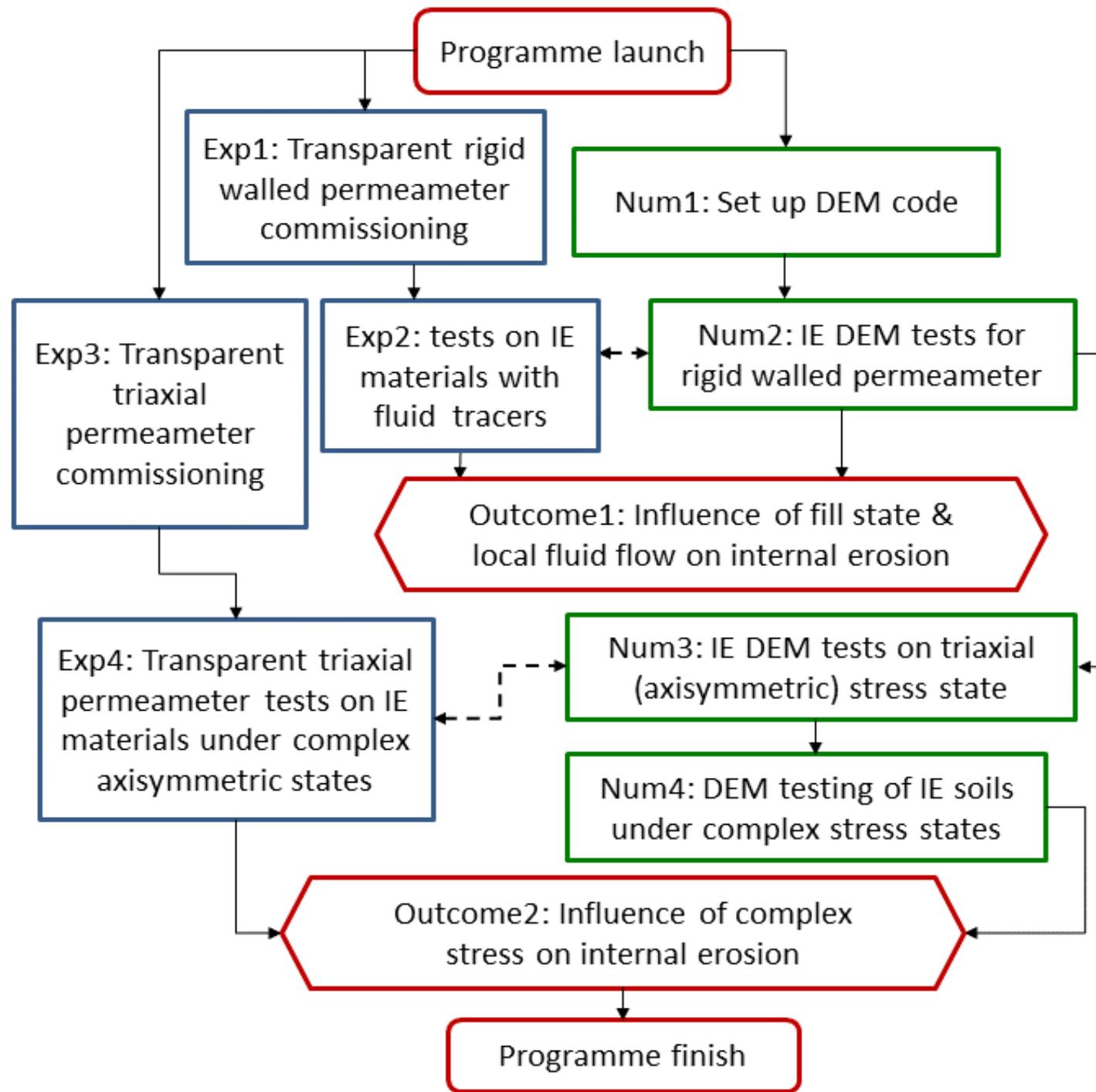


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Research Objectives

1. To clarify the conditions under which seepage induced instability initiates, continues and progresses to a condition where there are significant implications for engineering performance.
2. To establish how the stress state, and in particular the principal stress orientations relative to the seepage direction, influences the initiation of instability.
3. To clarify whether there is a fundamental basis to support a recent proposal to use seepage velocity rather than hydraulic gradient as a design criterion.

Project Plan



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11:45 Dr. Elisabeth Bowman (University of Sheffield) - Transparent Soil and Internal Erosion

12:10 Dr. Tom Shire (University of Glasgow) *“Micro-scale Modelling of Internally Unstable Soils”*

12:35 Dr. Adnan Sufian (Imperial College) : *“Insights into fluid flow, water retention and deformation using pore-scale characterisation of granular materials”*

12:45 Dr. Ed Smith (Imperial College) *“Linking Computational Fluid Dynamics and the Discrete Element Method for Large Scale Simulations”*

12:50 Chris Knight (Imperial College) *“Pore scale modelling of fluid flow in dense grain packings with the Immersed Boundary Method”*