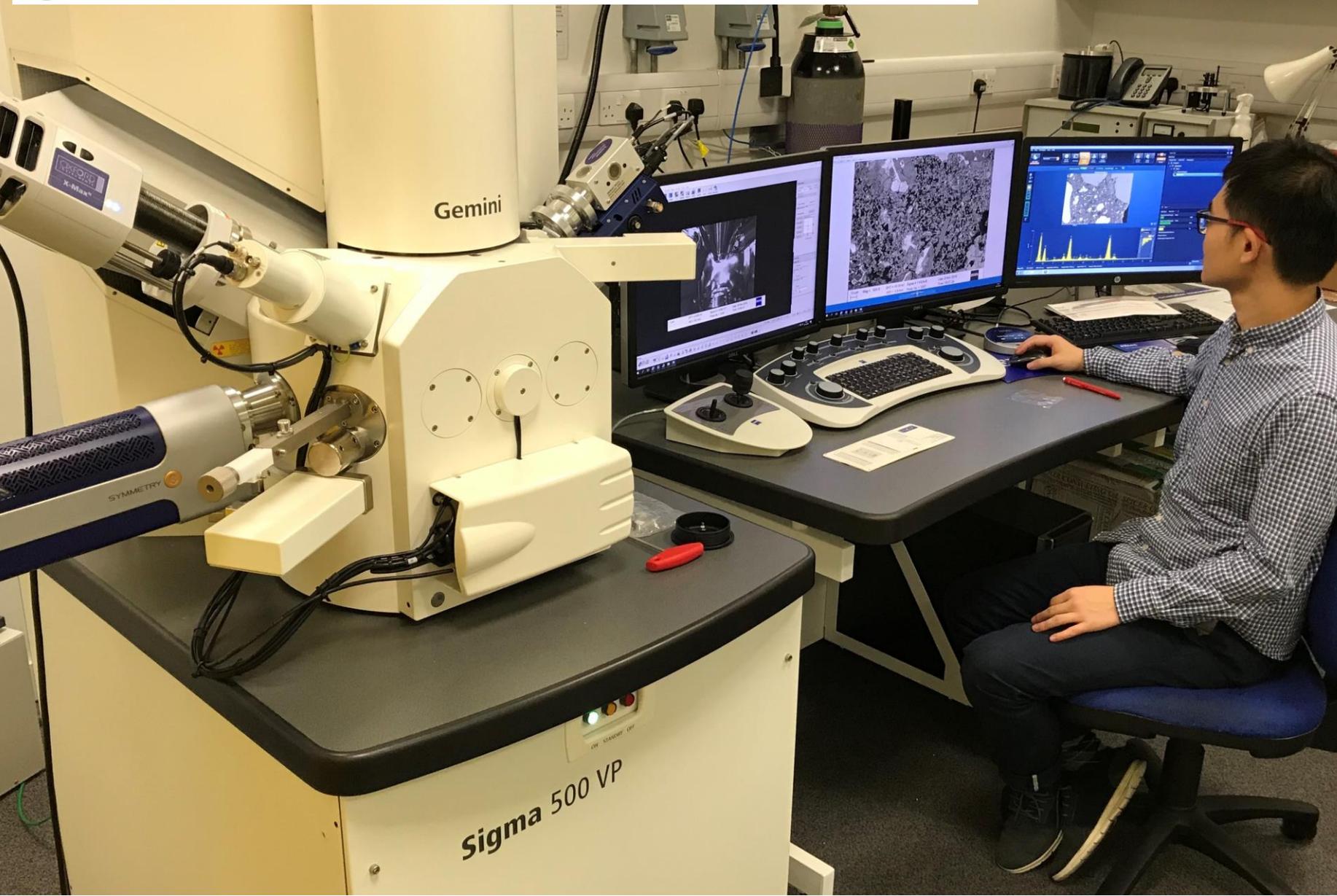


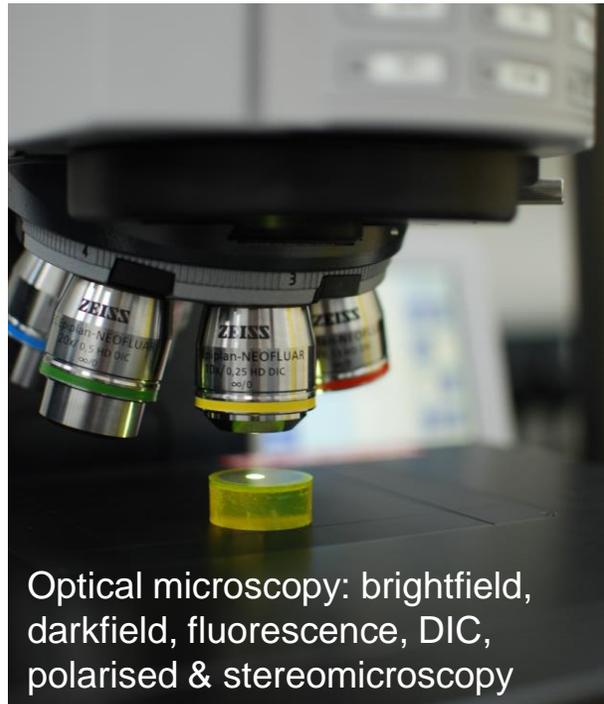
Imperial Centre for Infrastructure Materials

 UKCRIC Advanced Infrastructure Materials Lab



About us:

- EPSRC funding, including £5.4M to create and equip new suite of laboratories and offices
- To allow processing, imaging, analysing and testing of infrastructure materials
- Based in the Department of Civil and Environmental Engineering, Imperial College London
- *Materials Section* + Associate Members from across the Department and College
- Provide world-leading facilities for research into infrastructure materials
- Centre for training on infrastructure materials
- Fully up and running in 2020
- Collaboration is key to success: A National Centre!



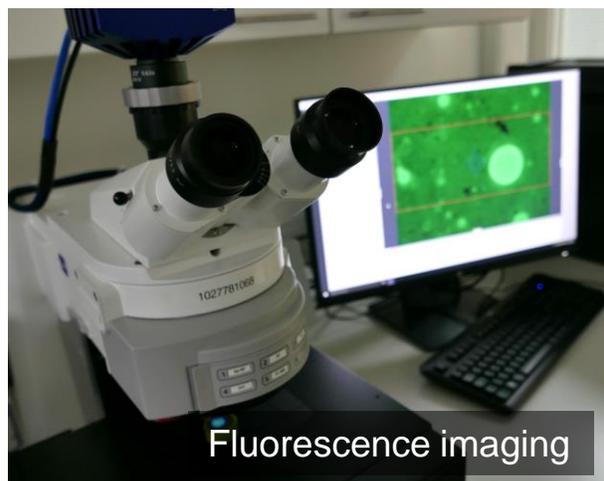
Optical microscopy: brightfield, darkfield, fluorescence, DIC, polarised & stereomicroscopy



Field emission SEM with EDS, WDS, EBSD & STEM

Facilities: Imaging

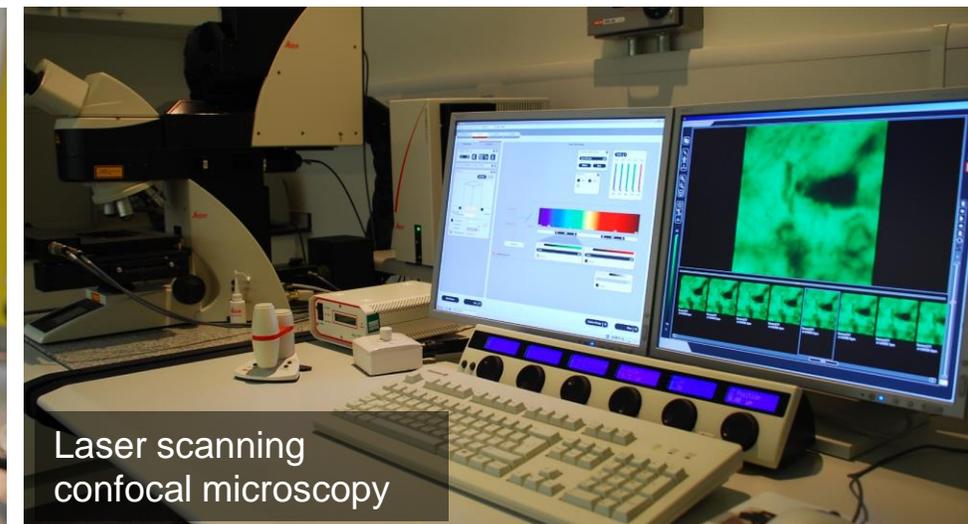
- Optical microscopes in brightfield, darkfield, DIC fluorescence and polarized modes
- Stereomicroscope with fluorescence imaging and motorised stage
- Field-emission scanning electron microscope with EDS, WDS, EBSD & STEM
- Table-top scanning electron microscope with EDS
- Laser scanning confocal microscope



Fluorescence imaging



Tabletop SEM with EDS



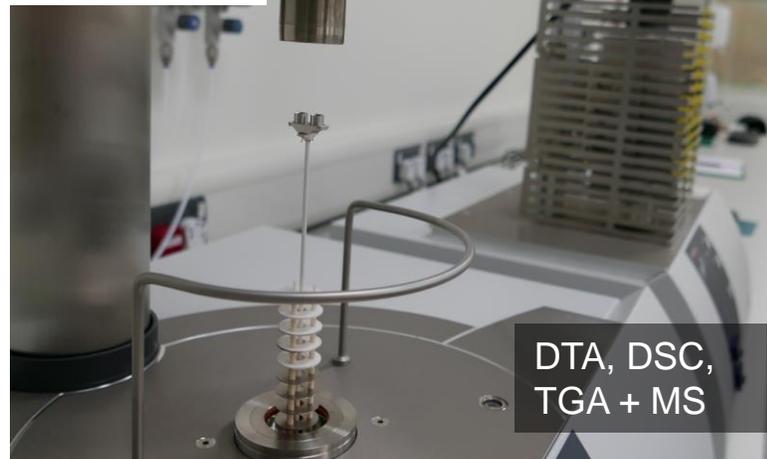
Laser scanning confocal microscopy

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Wet chemistry + ICP OES



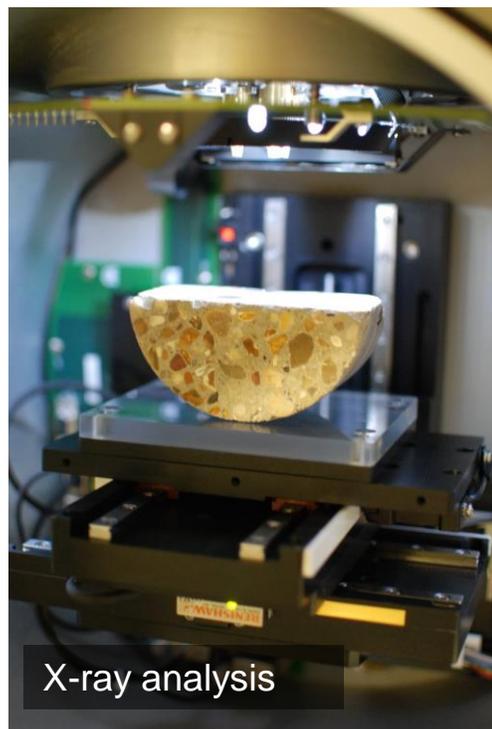
DTA, DSC,
TGA + MS

Facilities: Chemical characterisation

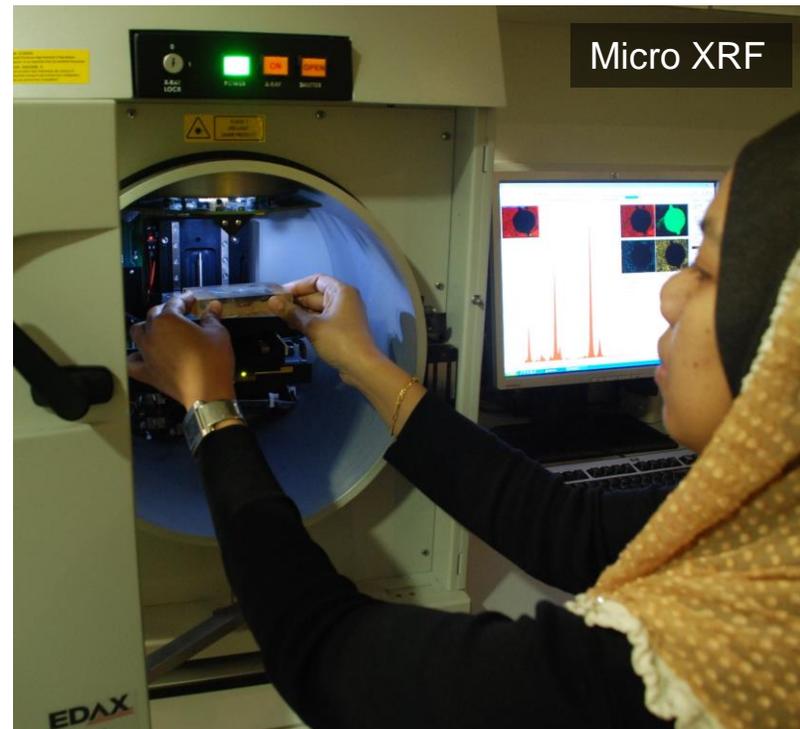
- X-ray diffraction
- X-ray fluorescence
- Micro-XRF
- DTA, DSC and TGA with mass spectrometry
- Isothermal calorimetry
- Optical emission spectroscopy
- FTIR spectroscopy
- Raman spectroscopy and microscopy
- Wet chemistry



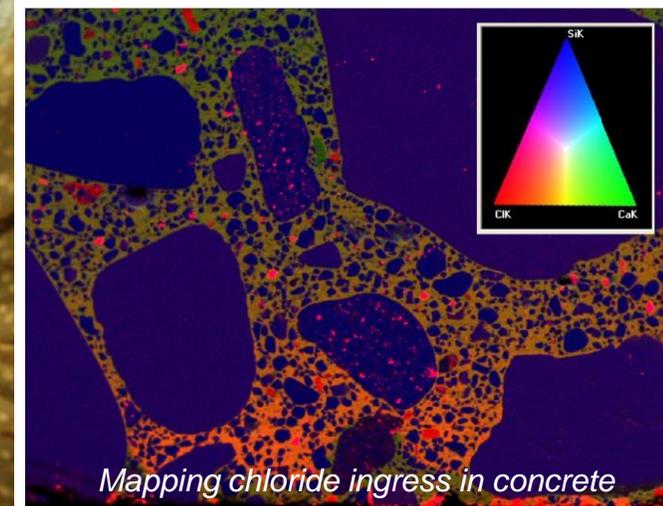
Isothermal
calorimetry



X-ray analysis



Micro XRF



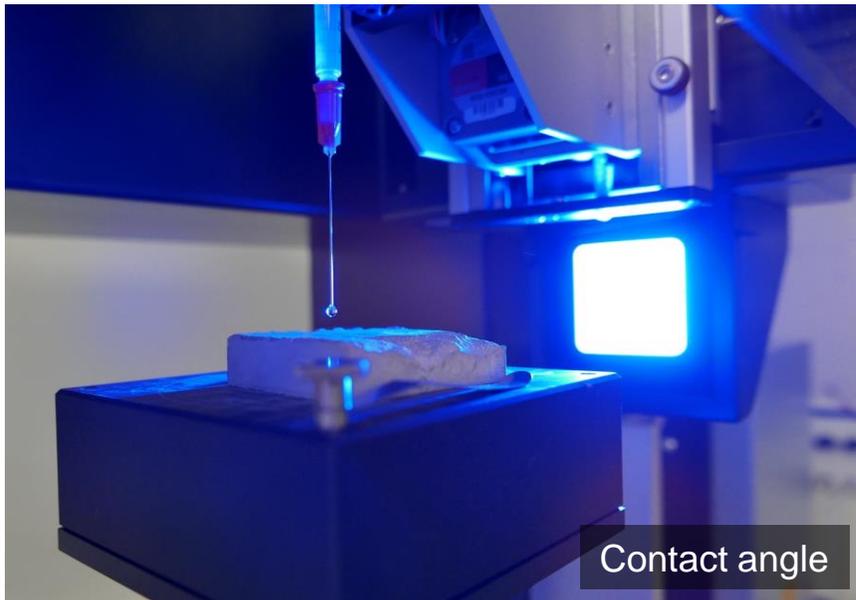
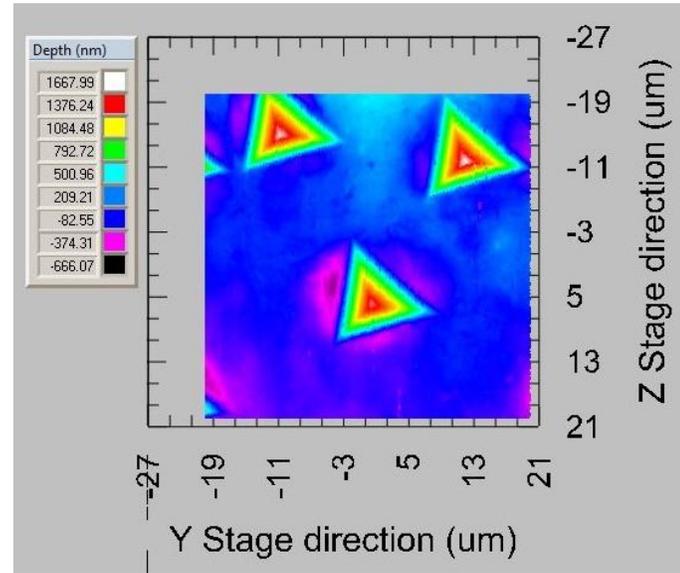
Mapping chloride ingress in concrete

Facilities: Surface characterisation

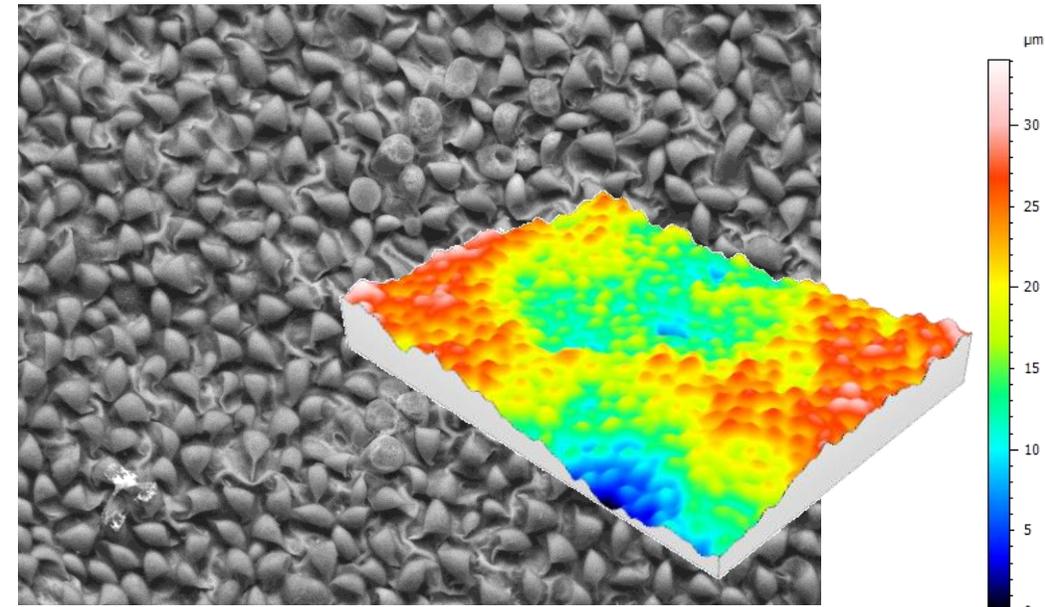
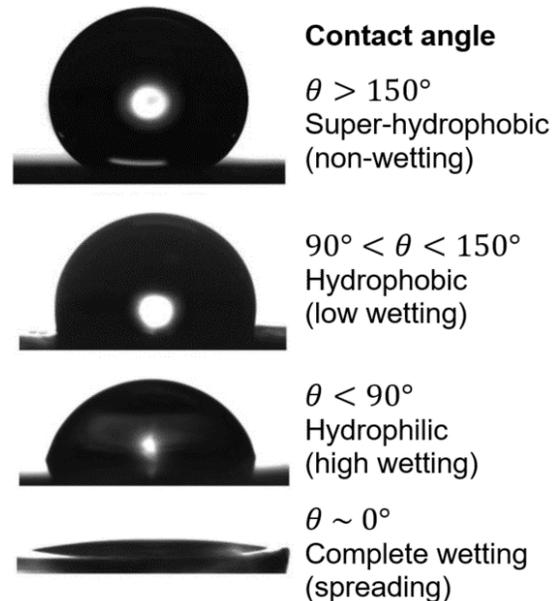
- Micro and nano-indentation
- Scratch, wear, impact and fatigue testing
- Contact angle, wettability and surface energy measurement
- Surface morphology
- Surface roughness
- 3D laser scanners



Micro and nano micro indentation



Contact angle



Facilities:

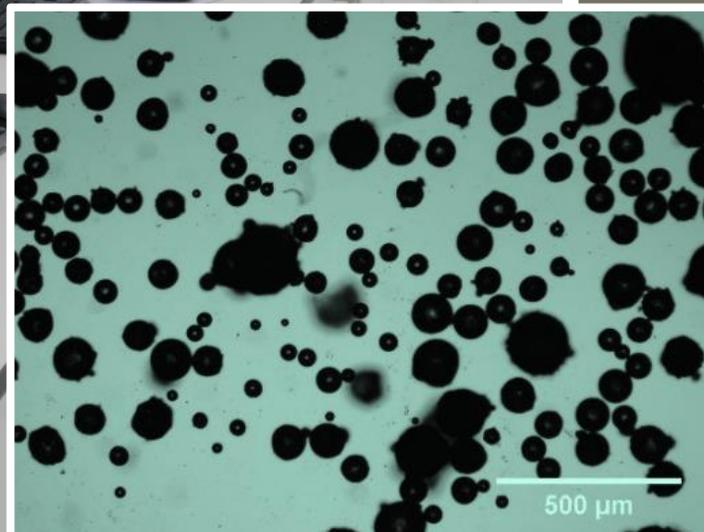
Particle and pore structure

- Laser diffraction granulometry
- Gas adsorption
- Dynamic vapour sorption
- Helium pycnometry
- Mercury intrusion porosimetry
- Dynamic vapour sorption
- AC impedance spectroscopy

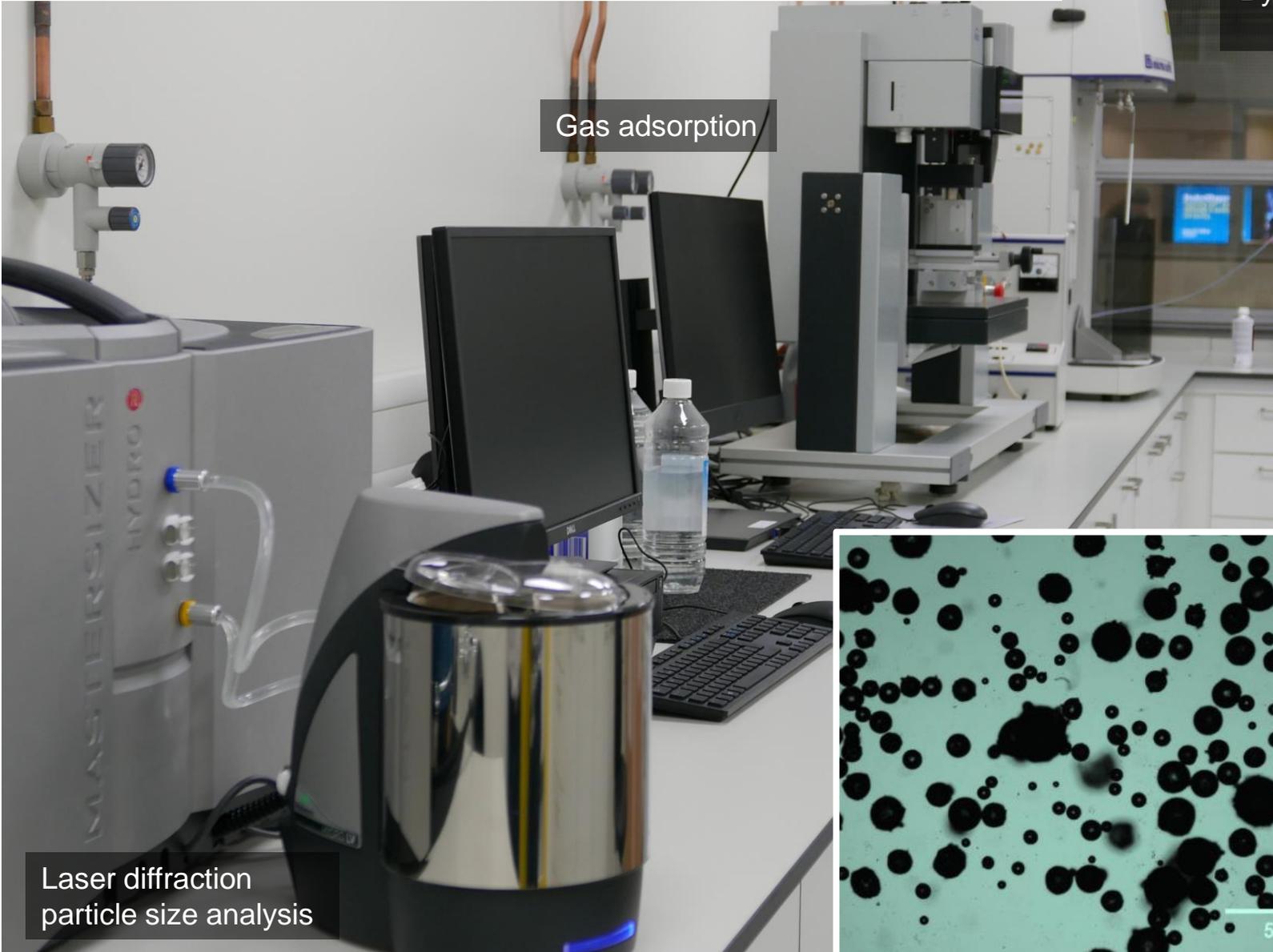
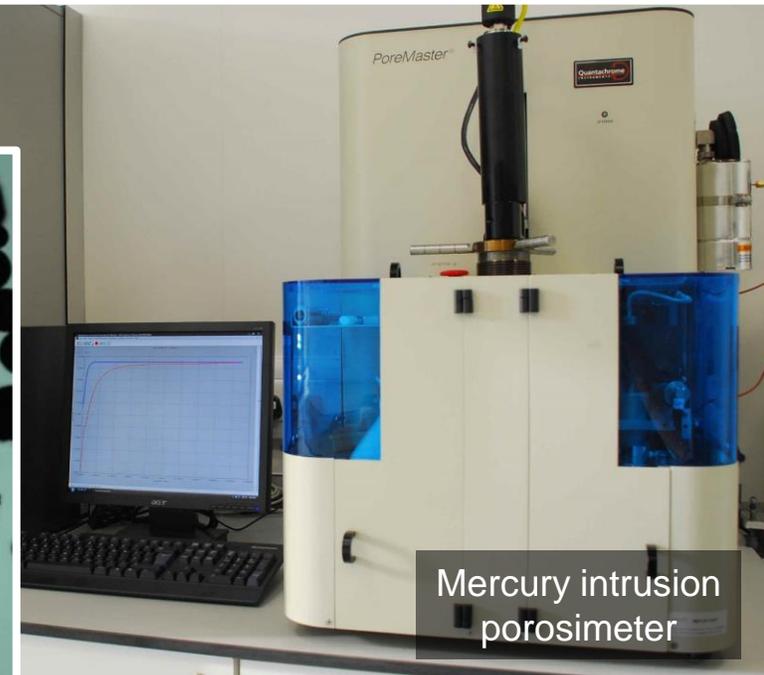
Gas adsorption

Dynamic vapour sorption

Laser diffraction
particle size analysis

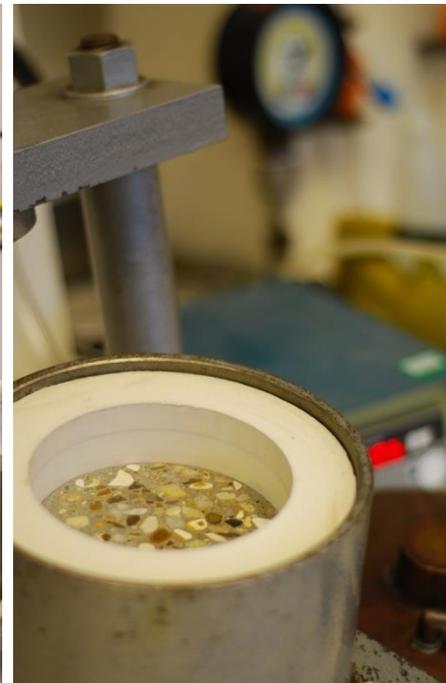
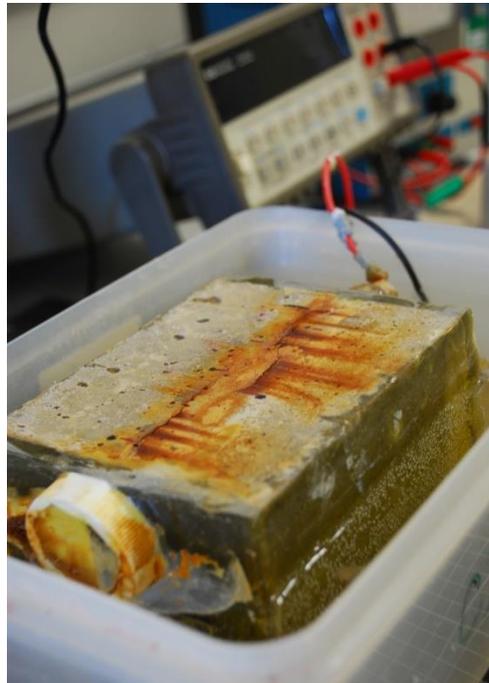
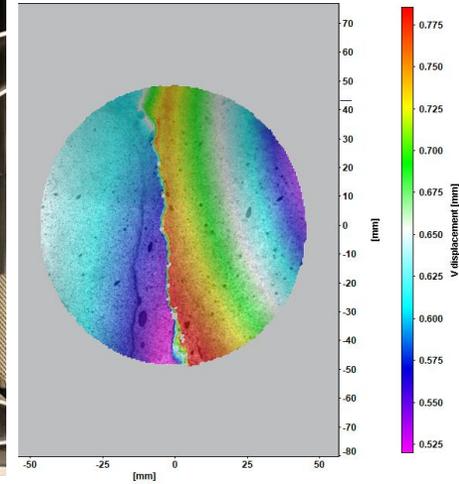
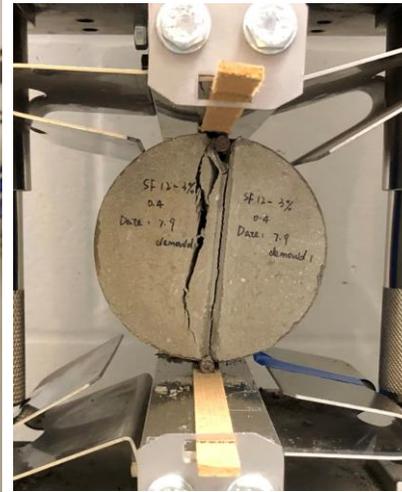


Mercury intrusion
porosimeter



Facilities: Materials processing, physical properties & durability

- Rheology and fresh state properties
- Mechanical strength
- Thermal conductivity
- Acoustic emission & NDT
- 3D digital image correlation
- Molecular and ionic transport properties
- Corrosion and electrochemistry
- AC impedance spectroscopy
- Dynamic triaxial cell
- Triaxial permeameter
- Various mixers, cutters, crushing/milling/pelletising and sample preparation equipment



People, expertise & research areas



Chris Cheeseman

Professor of Materials Resources Engineering

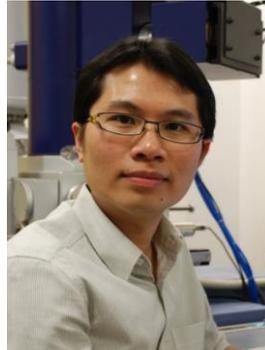
Head of Materials Section
Director of UKCRIC AIM



Nick Buenfeld

Professor of Concrete Structures

UKCRIC Management Board



Hong Wong

Reader in Structures and Materials

Director of CIM Laboratories



Rupert Myers

Senior Lecturer in Sustainable Materials Engineering



Emilio Martinez-Paneda

Senior Lecturer in Mechanics of Materials



Chao Wu

Senior Lecturer in Civil Engineering Materials



Craig Buchanan

Lecturer in Construction



Marcus Yio

Research Associate
Laboratory Manager



Rebecca Naessens

Section Administrator



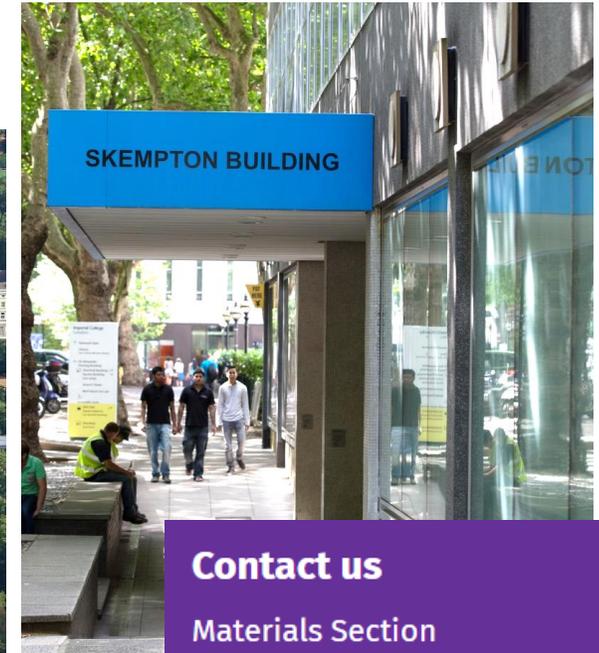
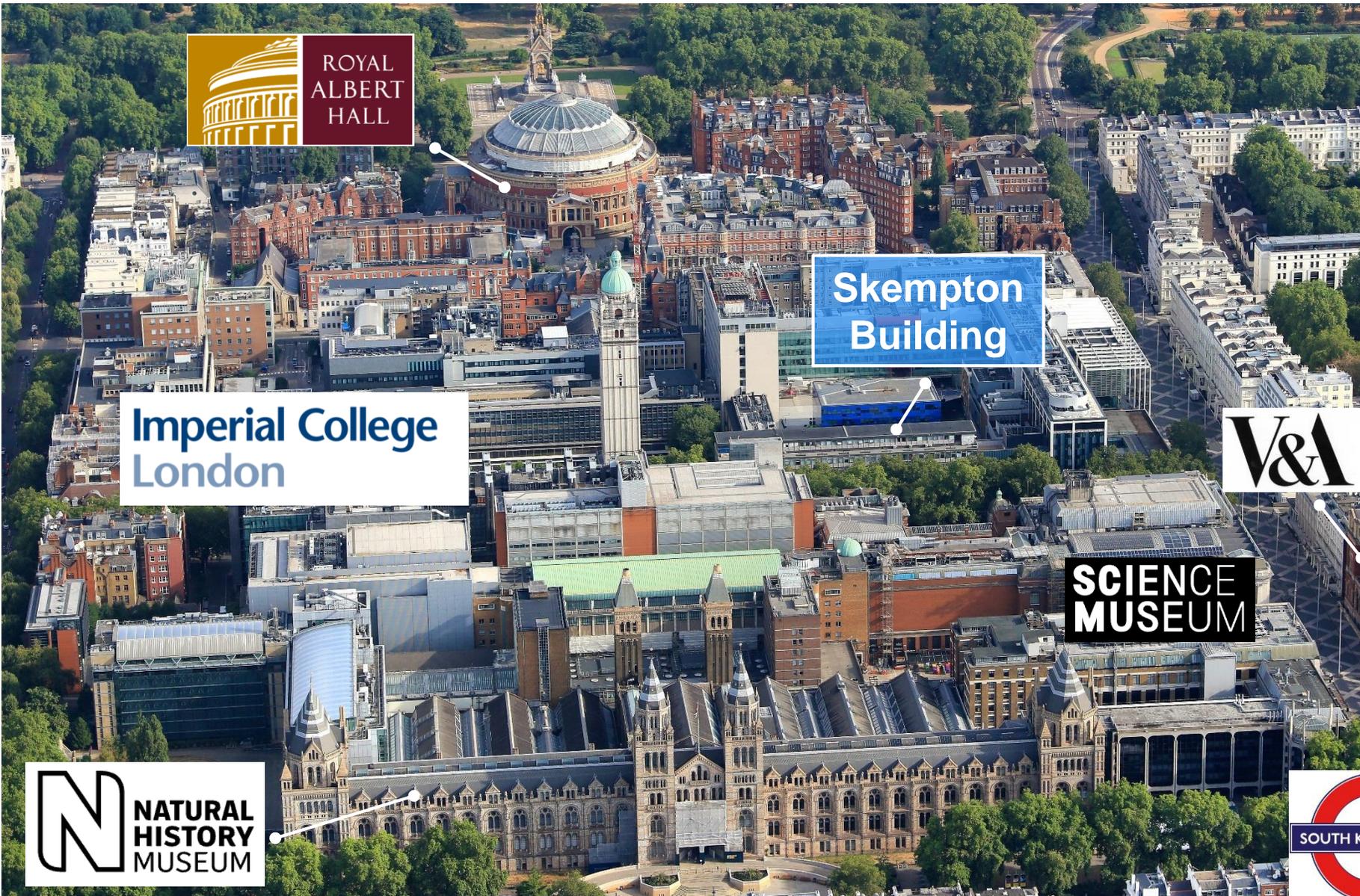
Andrew Morris

Laboratory Technician

Examples of current research

- **Low-carbon sustainable infrastructure:** *New cements, 3D printed metals, industrial ecology*
- **Long-term durability and performance:** *Concrete durability, fracture mechanics, service-life prediction*
- **Functional and improved materials:** *New types of permeable pavement, durable super-hydrophobic surfaces*
- **Circular economy:** *Novel thermal insulation materials, new biomaterials, ceramic processing, plastics in the oceans*

- > 25 PhD students
- ~ 30 MSc students *Advanced Materials for Sustainable Infrastructure*
- Postdocs & Research Fellows
- + Associate Members from across the Department and College



Contact us

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