MANCHESTER 1824
The University of Manchester

MACE

MACE research interests

Aerodynamics

Nicholas Bojdo - Lecturer in Aerospace Engineering

- Computational Fluid Dynamics (CFD)
- Engineering design and optimisation
- Filtration and separation
- Engine-Airframe integration
- Rotorcraft performance and design
- Particle and powder technology

Antonino Filippone - Reader in Aerospace Engineering

- Computational aerodynamics: low-order methods to high-performance computing
- Configuration aerodynamics, including aircraft, rotorcraft systems, advanced propellers
- Aero-acoustics and aircraft noise
- Flight mechanics of fixed-wing aircraft and rotorcraft
- Airframe-engine integration, intake aerodynamics, aero-thermodynamics of gas turbine engines
- Aerospace systems engineering, including structural mechanics and thermo-physics
- Industrial fluid dynamics in the process/power industry, including two-phase flows
- Numerical methods, applied math, optimisation, heuristic methods and networks, big data analysis
- Software engineering: architecture, system design, development.

Adrian Harwood - Lecturer in Virtual Engineering

- Real-time simulation
- Engineering visualisation and interaction (AR/VR)
- HPC (GPU/Many-core CPU)
- Mobile Computing (Android-based)

Mark Quinn - Lecturer in Aerospace Engineering

- Flow diagnostics techniques, particularly optical methods such as schlieren, PIV, PSP, IR thermography
- Image processing algorithms
- Compressible aerodynamics, particularly unsteady aerodynamics

Alistair Revell - Reader in Computational Healthcare Engineering

- Turbulence simulation (Hybrid RANS-LES Methods, Synthetic Turbulence)
- Computational Fluid-Structure Interaction
- Interactive/Realtime/Immersive computer simulation
- Computational biofluid mechanics

Shan Zhong - Professor of Experimental Fluid Mechanics

- Experimental aerodynamics
- Biofluid mechanics
- Boundary layer laminar-turbulent transition
- Flow control
- Enhancement of fluid mixing
- Low Reynolds number propulsion

Autonomous systems

William Crowther - Reader in Aerodynamic Engineering

- Experimental aerodynamics
- Engineering design and optimisation
- Engineering dynamics
- Design, control and flight test of Unmanned Air Vehicles (UAVs), including fixed, rotary and flap
- Development of novel vision and acoustic based sensing systems for indoor navigation
- Flow control, including development of fluidic manoeuvre effectors for flapless aircraft, flow separation
- Flapping flight. Development of flapping wing propulsion systems for sub 1g insect like flight vehicles
- Fluidic micropumping solutions for industrial applications

Peter Hollingsworth - Senior Lecturer in Aerospace

- Engineering design and optimisation
- Systems engineering
- Life-cycle cost analysis
- Transportation systems
- Aircraft design
- Design methods
- Complexity

Mostafa Nabawy - Lecturer in Aerospace Engineering

- Flying and jumping microrobots
- Micro air vehicles (MAV)/Unmanned aerial systems (UAS)
- Subsonic wing aerodynamics (fixed/rotary/flapping)
- Pizoelectric actuated microsystems (e.g. micropumps)
- Pizoelectric energy harvesters
- Design optimisation of morphing wings
- Biomimetics and bio-inspiration
- Biomechanics
- Multidisciplinary design optimisation

Ben Parslew - Senior Lecturer in Aerospace Engineering

- Biomechanics
- Engineering design and optimisation
- Flapping-wing flight
- Animal locomotion
- Biomimetics
- Biomechanics
- Unmanned air vehicles
- Physics-based animation
- Multibody dynamics
- Robotics

Environmental engineering

David Apsley - Lecturer in Civil Engineering

- Computational fluid dynamics (CFD)
- CFD renewables
- Coastal engineering
- Computational fluid mechanics
- Turbulence modelling
- Renewable energy (marine and wind)
- Heat transfer
- Environmental flow
- Mathematical programming in Fortran and C++

Andrea Bottacin Busolin - Lecturer in Water Engineering

- Transport phenomena in turbulent flows over porous beds
- Flood risk assessment and management
- Water quality modelling
- Wastewater treatment wetlands
- Modelling and optimisation of urban drainage and water supply systems
- Data assimilation and uncertainty analysis of hydro-environmental models
- Reservoir operation
- Bioremediation of groundwater sites
- Reactive transport modelling of CO2 leakage from geological storage sites

Timothy Foster - Lecturer in Water-Food Security

- Hydro-economic modelling of the feedbacks between agricultural production decisions and aquifer sustainability, and the effectiveness of alternative groundwater management policies.
- Development and application of crop simulation models to understand the effects of water scarcity, climate variability and change, and field management practices on crop yields and resource use efficiency.
- Exploring the value of remote sensing and smart data technologies for monitoring and improvement of agricultural water use efficiency at field to catchment scales.

Fourtakas Georgios - Lecturer in Smoothed Particle Hydrodynamics

- Meshless methods and computational fluid dynamics
- Lagrangian, semi Eulerian-Lagrangian and ALE SPH formulations
- Hybrid codes with weak or strong coupling methodologies
- Sediment transport, multi-phase flows, non-Newtonian flows
- High-performance computing (GPU-CUDA and MPI)

Julien Harou - Chair in Water Engineering

- Water Engineering

Steven Lind - Reader in Smoothed Particle Hydrodynamics

- Smoothed particle hydrodynamics (SPH)
- Computational fluid dynamics (CFD)
- Free-surface flows
- Multiphase flows
- Non-Newtonian flows

Domenico Lombardi - Lecturer in Geotechnical Engineering

- Geotechnical earthquake engineering
- Soil liquefaction
- Offshore geotechnical engineering
- Pile driving
- Seismic resilience of nuclear power plant
- Structural dynamics
- Renewable offshore energy
- Physical modelling

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Environmental engineering (cont'd)

Benedict Rogers - Professor of Computational Hydrodynamics

- Coastal engineering
- Smoothed particle hydrodynamics (SPH)
- Wave energy systems
- Free-surface hydrodynamics, smoothed particle hydrodynamics (SPH), shallow water equations (SWEs)
- Numerical methods
- Multi-phase flows
- Wave breaking
- Flooding
- Tsunamis
- Novel hardware, GPUs

Majid Sedighi - Senior Lecturer in Geotechnical Engineering

- Geo-materials engineering
- Subsurface energy and environmental
- Coupled thermal, hydraulic, chemical and mechanical behaviour of unsaturated soils.
- Chemo-mechanical processes under demanding environments (e.g. rock matrix acidisation)
- Reactive transport modelling of chemicals and gas in porous media
- Clay barriers for geoenvironmental applications (e.g. geological disposal of HLW)
- Thermo-active geo-structures (e.g. ground-based energy systems)

Timothy Stallard - Reader in Offshore Renewable Energy

- Tidal stream turbines
- Wave energy systems
- Tidal stream energy
- Wave energy
- Wave-current-structure interaction

Peter Stansby - Osborne Reynolds Chair

- Coastal engineering
- Computational fluid dynamics (CFD)
- Smoothed particle hydrodynamics (SPH)
- Environmental flows: tidal flows, pollution dispersion, sediment transport
- Coastal hydrodynamics: wave mechanics, surf zone processes, flooding
- Shallow-water hydrodynamics: numerical model development, flooding, dam breaks
- Offshore hydrodynamics: wave forces, flow-induced vibrations, slam forces
- Numerical modelling and experimental verification of above areas

Mohd Ahmad Syed - Lecturer in Geotechnical Engineering

- Geotechnics
- Earthquake geotechnical engineering
- Geomechanics problems - numerical and analytical modelling (FEM, FDM, DEM etc.)
- Reinforced soil wall and slopes
- Ground engineering
- Waterfront retaining structures

Richard Taylor - BNFL Chair in Nuclear Energy Systems

- TK electrical engineering.
- Electronics
- Nuclear engineering,
- Nuclear decommissioning and waste management,
- Nuclear energy technology

Management of Projects

Mohamed Abadi - Lecturer in Management of Projects

- Circular economy (CE) in construction
- Risk management in construction projects
- Construction communications
- Virtual teams (VTS) in construction
- Contractor prequalification and bid evaluation
- Decision-making methods in general

Paul Blackwell - Senior Lecturer in Management of Projects

- Atmospheric science

Clara Cheung - Lecturer in Project Management

- BF psychology - positive and organisational psychology
- TA engineering (general), civil engineering (general) - health and safety
- HA statistics - structural equation modelling
- Management of projects

William Collinge - Lecturer in Project Management

- Action research
- Semiotics
- Stakeholder management

Helen E Dobson - Senior Lecturer in Management of Projects

- People, organisations and culture
- Sustainable development and circular economy
- Education (transformational project based learning and assessment)
- Engineering ethics and social responsibility

Rodger Edwards - Reader in Materials and Building Performance

- Built environment
- Energy conservation
- Ventilation and air movement
- Condensation
- Building performance
- Zero emissions buildings

Obuks Ejohwomu - Lecturer in Project Management

- Civil engineering (general) - procurement , diversity, manpower modelling, health care process optimisation, social value, productivity, academic practice, global south, effective communication

Peter Fenn - Reader

- Commercial conflict and disputes and their aetilology
- Dispute resolution
- Arbitration
- Mediation
- Adjudication
- Construction

Richard Kirkham - Senior Lecturer in Civil Engineering

- Biomechanics
- Quantitative techniques
- Whole-life costing
- Stochastic modelling
- Performance measurement techniques

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Management of Projects (cont'd)

Patrick Manu - Senior Lecturer/Reader in Management of Projects

- Occupational safety and health
- Digital construction
- Sustainable construction
- Procurement

Ian Stewart - Senior Lecturer in Management of Projects

- People, organisations and culture
- Conflict and dispute resolution

Jillian Yeow - Lecturer in Business Model Innovation

- ICT-enabled work and organisation
- Organisation behaviour and change; organisational innovation
- Project-based work and organising
- Communities of practice, knowledge and learning
- Science and technology policy
- Public procurement and demand-side innovation policy

Lihong Zhang - Lecturer in Business Model Innovation

- Product-service system

Manufacturing

Olivier Allegre - Lecturer in Laser Processing

- Ultrashort-pulse laser processing: micro-machining, surface micro-texturing and internal structuring
- Laser additive manufacturing
- Laser processing of composite materials

Otto Jan Bakker - Lecturer in Mechanical Design

- TJ mechanical engineering and machinery - control, finite element modelling and analysis, mechanical engineering design, product family design, design optimisation
- TS manufactures - manufacturing industry, manufacturing system design, automation, condition monitoring, non destructive testing, process optimization

Paulo Bartolo - Chair in Advanced Manufacturing

- Cell and tissue engineering
- Medical devices and assistive technologies
- Additive manufacturing
- Biomanufacturing
- Product development

April Bryan - Lecturer in Advanced Manufacturing

- TJ mechanical engineering and machinery - product family design, design optimisation, genetic algorithms, vibration analysis
- TS manufactures - manufacturing system design, reconfigurable manufacturing systems, concurrent design of product families and assembly systems, line balancing, simple assembly line balancing problem (SALBP)

Glen Cooper - Senior Lecturer in Solid Mechanics and Bioengineering

- Biomedical modelling
- Medical device development
- Lower limb biomechanics
- Novel measurement devices to understand medical problems

John Francis - Reader in Welding Technology

- Welding and cladding processes
- Welding metallurgy
- Residual stresses in welded joints and clad surfaces
- Microstructure-stress relationships in welds

David Gillen - Senior Lecturer in Laser Machining

- Innovative manufacturing
- Laser Processing Research Centre

Robert Heinemann - Lecturer in Innovative Manufacturing

- Advanced machining
- Engineering design and optimisation
- Drilling and reaming technology
- Process and tool development for minimally invasive surgery (keyhole surgery)
- Diamond-like carbon coatings for cutting tools
- (Preventive) tool and process condition monitoring in drilling
- Environmental benign machining, in particular dry and minimal quantity lubrication drilling
- Design, analysis and evaluation of machine tools
- Metrology

Manufacturing (cont'd)

Srichand Hinduja - Professor of Innovative Manufacturing

- Computer-assisted process planning of machined components
- Recognition of manufacturing features in turned and milled components
- Determination of optimum toolpaths for machining 2 1/2d milling features
- Pressure die casting
- Bi-metallic dies for rapid heat extraction
- Determination and compensation of errors in machine tools
- Optimum two-tool solutions for machining milling features
- Pulsating blankholders for improving the quality of deep drawn components

Moray Kidd - Senior Lecturer in Management of Engineering Projects

- Biomechanics
- Maintenance engineering - reliability, maintainability and availability

Engineering management - engineering design methods, expert systems for engineering and management

- Management of engineering projects - project scheduling and finance, management of quality and risk

Lin Li - Professor of Laser Engineering

- Science and technology of laser materials processing, additive manufacturing and 3d printing, micro/nano fabrication, nano-imaging, nano-materials including graphene, biomedical applications of laser processing and graphene, battery manufacture
- Drilling (thermal barrier coated ni alloys, carbon composites etc)
- Cutting (composite materials, ceramics, striation-free cutting of metals, pipes and vessels)
- Welding (dissimilar materials, light alloys, composites and ceramics, graphene, thick sections)
- Surface engineering (hardening, coating, cladding, sealing cracks/porosity, texturing, cleaning)
- Additive manufacturing (rapid tooling, rapid manufacturing, repair, re-manufacturing)
- Micro-machining for medical and renewable energy applications
- Nano-manufacturing (nano-surface structures, nano-particles)
- Hybrid manufacturing (laser-EDM machining, laser/mechanical machining, laser/arc welding)
- Modelling of laser interactions with materials and effects
- Nano-imaging

Paul Mativenga - Professor in Multi-Scale and Sustainable Manufacturing

- Resource efficient manufacturing
- Advanced machining
- Circular economy
- Smart manufacturing
- Sustainable manufacturing
- Green manufacturing
- Energy demand and consumption reduction
- Machining science and technology at micro and macroscale
- High speed machining
- Recycling
- Additive manufacturing

Mike C. Smith - Professor of Welding Technology

- Welding
- Weld modelling

Andrew Weightman - Senior Lecturer in Medical Mechatronics

- Medical devices and assistive technologies
- Rehabilitation robotics
- Next generation healthcare technology

Materials

Timothy Abram - Professor in Nuclear Fuel Technology

- Nuclear fuel and fuel cycle technology
- Reactor systems technology

Robert Ainsworth - Professor of Structural Integrity

- Nuclear graphite
- Structural integrity
- Fracture mechanics
- Creep

Roohoolamin Darvizeh - Lecturer in Mechanics

- Impact and explosion engineering
- Continuum mechanics
- Finite element analysis

Keith Davey - Reader in Structural, Materials and Mechanical Engineering

- Material and structural response at high strain rate
- Solidification modelling
- Casting simulation
- Impact and fracture mechanics
- Moving boundary problems
- Boundary element methods
- Efficient solution methods
- Metal forming and its modelling
- Scaled experimentation
- Transport equations

Marco Domingos - Senior Lecturer in Bioprinting and Regenerative Medicine

- Cell and tissue engineering
- Medical devices and assistive technologies
- Biomechanics
- 3D bioprinting
- Biomaterials
- Regenerative medicine
- Stem cells
- Skeletal tissue regeneration
- 3D tissue models

Graham Hall - Senior Lecturer in Nuclear Graphite

- Nuclear graphite/Nuclear grade graphite
- Microstructural modelling
- Computed X-ray tomography
- Finite element modelling

Sarah Heath - Professor of Nuclear Chemistry

- Development of analytical techniques for trace radioactive nuclides
- Radioactive contaminants in water-cooled nuclear reactor cooling circuits

Masoud Jabbari - Lecturer in Mechanical and Aerospace Engineering

- Heat and mass transport in porous media
- Complex flow – rheology
- Numerical analysis
- (Nano-)composite manufacturing
- Thermal management of batteries
- Microfluidics-integrated biosensors

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Materials (cont'd)

Abbie Jones - Chair in Nuclear Graphite

- Nuclear graphite
- Irradiation damage in nuclear graphite
- Graphite waste treatment and disposal
- 14C and 3H isotopic reduction
- Microstructural characterisation
- Transmission electron microscopy
- Raman spectroscopy
- X-ray & synchrotron diffraction
- Synchrotron tomography

Laura Leay - Nuclear Engineering innovation Fellow

- Holistic evaluation of safety margins in current nuclear engineering practice

Barry Marsden - Professorial Fellow of Science (Nuclear)

- Nuclear graphite
- Graphite moderated reactors: design, operation, safety, decommissioning
- Modelling irradiated graphite behaviour using finite element techniques

Paul Mummery - Chair in Nuclear Graphite Technology

- Nuclear graphite
- Nuclear materials
- Composite materials
- 3D imaging
- FE modelling
- High performance computing

Matthew Roy - Senior Lecturer in Materials for Demanding Environments

- Welding
- Resource efficient manufacturing
- Engineering design and optimisation
- Materials engineering
- Materials processing
- Metal forming

Joel Turner - Dalton/Rolls-Royce Fellow in Nuclear Fuel Technology

- Nuclear fuel technology

Mechanics and Physics of Solids

Elijah Borodin - Research Fellow in Materials

- Materials science
- High strain rate
- Severe plastic deformation
- Materials; composites, mechanics of materials, numerical simulation, theoretical physics

Andrey Jivkov - Professor of Solid Mechanics

- Fuel and reactor technology
- Energy and multiphysics
- Nuclear graphite
- Multiple-scale modelling of the mechanical behaviour of solids
- Multi-physics modelling of materials degradation
- Deformation and transport properties of porous/fractured media
- Fracture and damage mechanics
- Structural integrity assessment
- Computational solid and structural mechanics

Kali-Babu Katnam - Lecturer in Structural Engineering

- Adhesive bonding in composite structures
- Structural integrity and damage tolerance of structural bonded joints
- Composite structural repairs
- Multi-scale toughening in advanced polymer composites
- Experimental and computational solid mechanics

Boyan Lazarov - Senior Lecturer in Solid Mechanics

- Topology optimization and design
- HPC with applications in solid and fluid mechanics, acoustics, multi-physics
- Design for manufacturing
- Multi-scale designs

Lee Margetts - Senior Lecturer in Structural Integrity

- High performance computing
- Artificial intelligence
- Computational solid mechanics
- Finite element method
- Virtual and augmented reality in engineering
- Multiscale and multiphysics modelling

Space

Peter Roberts - Senior Lecturer in Spacecraft Engineering

- Spacecraft systems engineering
- Dynamics of spacecraft interactions with the atmosphere
- Astrodynamics
- Space debris mitigation

Katharine Smith - Senior Lecturer in Aerospace Engineering

- Spacecraft systems engineering
- Satellite propulsion
- Constellation deployment
- Space robotics
- Electrospray technology

Ali Turan - Chair in Thermodynamics of Power Generation

- Computational fluid dynamics (CFD)
- Energy and multiphysics
- Hydrodynamic stability theory
- Direct and large-eddy simulation of non/reacting, multi-phase, turbulent flows
- Re-normalisation group methods for turbulence, dynamical systems, flow, heat and combustion control
- Development of high-order numerical techniques for dis/continuous problems in complex geometries
- Computational multi-scale multi-physics problems ranging from power generation to biophysical flows
- Design, development and modelling of advanced energy conversion hardware and cycles
- Coupled neutron transport and LES thermal hydraulics capability development
- Refined multiphase flow modelling activity development
- BWR power instabilities , modelling and prediction including non-linear (HOPF bifurcation, etc)
- Optimization and safety issues delineation and prediction with new gen3 and 4 reactor configurations
- Space reactor design for propulsion
- Downstream hardware design and development for stationary power generation

Sergey Utyuzhnikov - Reader in Computational Mathematics

- Material and structural response at high strain rate
- Computational fluid dynamics (CFD)
- Engineering design and optimisation
- Industrial mathematics
- Boundary equations
- Potentials theory
- Artificial (non-local) boundary conditions
- Computational fluid dynamics
- Multi-objective optimisation
- Active noise shielding and sound control
- Turbulence modelling (wall-functions, v2-f model)
- Combustion and multiphase flows
- Hypersonic flows

Structure, Health and Maintenance

Iain Dupere - Reader in Acoustics

- Acoustics
- Mechanics
- Speed bumps
- Condition Monitoring

Mojgan Hadi Mosleh - Lecturer in Geoenvironmental Engineering

- Development and characterisation of cementitious material (composite cement) for extreme environments.
- Geomechanical and flow behaviour of rocks and cementitious material under extreme subsurface pressure and temperature conditions.
- CO2 storage, mitigation and remediation of gas leakage from storage sites.
- Unconventional energy applications (EOR, EGR, ECBM, Shale gas).
- Wellbore integrity
- Landslide and slope stability: development of advanced monitoring system and mitigation strategies.
- Climate change and disaster risk reduction (RRD).
- Environmental impact assessment (EIA).
- Building information modelling (BIM)

Parthasarathi Mandal - Reader in Bioengineering

- Cell and tissue engineering
- Biomechanics
- Medical devices and assistive technologies
- Bio-engineering
- Computational mechanics
- Thin-walled structures

Lei Ren - Reader in Biomechanics and Biorobotics

- Biomechanics
- Medical devices and assistive technologies

Jyoti Sinha - Professor of Condition Monitoring and Plant Maintenance

- Engineering dynamics
- Biomechanics
- Maintenance engineering, eMaintenance (Industry 4.0, IoT)
- Rotor dynamics by experiments and analysis
- Health monitoring techniques for rotating machinery
- Finite element (FE) modelling, analysis and model updating
- Seismic qualification
- Experimental modal analysis
- Condition monitoring and aging management of structures
- Vibration based diagnosis for ‘as installed’ structures and machines
- Advance signal processing
- Mems accelerometer
- Wireless sensing for vibration based condition monitoring
- Bioengineering

Azam Tafreshi - Lecturer in Engineering

- Engineering design and optimisation
- Aerospace engineering
- Fracture mechanics and structural integrity
- Finite element and boundary element methods
- Shape and topology optimisation of engineering structures
- Composite structures
- Numerical optimisation algorithms
- Contact analysis

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Structure, Health and Maintenance (cont'd)

Akilu Yunusa-Kaltungo - Lecturer in Plant Reliability and Maintenance Engineering

- Maintenance management
- Operations management
- Turnaround/shutdown/outage management
- Maintenance life cycle cost analysis
- Spare parts movement and optimisation
- Total productive maintenance (TPM)
- Reliability centred maintenance (RCM)
- Condition based maintenance (CBM)
- Multiple criteria decision analysis (MCDA)
- Faults detection and diagnosis
- Failure and accident investigation
- Industrial machinery condition monitoring data fusion

Zhenmin Zou - Lecturer in Structural Engineering

- Material and structural response at high strain rate
- Biomechanics
- Composite materials and structures
- Structural fracture and failure
- Structural dynamics, impact, energy absorption
- Behaviour of cellular materials Structure, Health and Maintenance

Structures in Extreme Environments

Philip Bonello - Reader in Engineering Dynamics

- Engineering dynamics
- Rotordynamics (non-linear vibrations in machinery, bearing dynamics, tribology, blade tip timing)
- Vibration
- Non-linear dynamics
- Structural dynamics
- Vibration control using smart structures/materials
- Vibration energy harvesting

Neil Bourne - Professor of Matter in Extreme Environments

- Extreme Science
- Risk
- Resilience
- National Facilities
- Population health and ecosystems
- Advanced Materials

Lee Cunningham - Senior Lecturer in Civil and Structural Engineering

- Coastal engineering
- Computational modelling and design of reinforced concrete structures
- Maritime structures
- Structural composites
- Fibre reinforced concrete
- Engineered timber

Andrew Foster - Lecturer in Structural Engineering

- Structural engineering

Tianjian Ji - Reader in Structural Vibration

- Human body response to vertical structural vibration
- Probabilistic risk assessment of nuclear power plants Structures & Extreme Environment

Pauleen Lane - Lecturer in Geotechnical Engineering

- Geotechnics
- Soil/structure interaction problems
- Variability of soil mechanics parameters
- Modelling of flexible pipes
- Applications of pulverised fuel ash (PFA) in new fields

Gregory Lane-Serff - Senior Lecturer in Fluid Dynamics

- Coastal engineering
- Built environment
- Buildings: natural ventilation of buildings
- Oceanography: straits, overflows, turbidity currents, hydrothermal plumes, marine outfalls
- Paleoceanography: response of ocean flows to changes in sea-level and climate
- Basic fluid dynamics: gravity currents, plumes, sediment, hydraulic control, rotation
- Methods: laboratory and mathematical modelling, field observations and numerical models

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Structures in Extreme Environments (cont'd)

Qingming Li - Professor of Applied Mechanics

- Material and structural response at high strain-rate
- Material and component behaviour under shock environment
- Multi-scale mechanics of cellular materials
- Penetration mechanics
- Structural crashworthiness (automotive and rail vehicles)
- Impact engineering and structural crashworthiness
- High strain-rate behaviour of engineering materials (concrete, foams, metals, polymers)
- Penetration mechanics at low-/intermediate-/high-/hyper-velocities
- Mechanics of cellular and composite materials
- Protective technology
- Multi-scale mechanics and modelling
- Structural responses under shock environment

S. Olutunde Oyadiji - Reader in Structural Engineering

- Engineering dynamics
- Material and structural response at high strain rate
- Viscoelasticity/viscoelastic materials
- Vibration/shock isolation/control/damping
- Smart materials/structures
- Multibody dynamics (impact, robotics)
- Structural fault identification
- Fracture/crack mechanics/analysis
- Composite materials/structures
- Biomechanics

Meini Su - Lecturer in Structural Engineering

- Aluminium alloy structures
- Durability of RC structures
- C-FRCM composite
- Continuous strength method (CSM)
- Impressed current cathodic protection - structural strengthening (ICCP-SS) Method

Yong Wang - Professor of Structural Engineering

- Fire engineering and structural behaviour
- Connections
- Material properties
- Heat and mass transfer
- Fire protection materials, intumescent coating
- Fire risk assessment
- FRP composites
- Numerical modelling
- Fire resistant testing
- Sandwich construction
- CFD modelling of fire spread
- Steel and composite
- Thin-walled structures
- Concrete filled tubes
- Impact resistance of structures
- Sustainable materials

Jack Wu - Lecturer in Structural Engineering

- Material and structural response at high strain rate
- Thin-walled structures
- Fibre reinforced polymer composite structures
- 3-D FRP woven composites
- Composite plate and shell structures
- 3-D anisotropic elasticity and micromechanics
- Analysis of adhesive stresses in dissimilar composite adherends
- FRP/concrete hybrid structures including repairing, retrofitting, strengthening
- Fracture analysis of high performance structural composites and NDT testing
- Toughening mechanism of fibre (whisker) reinforced cement and ceramic composites

Thermofluids

Imran Afgan - Senior Lecturer in Renewable Energy Systems

- Computational fluid dynamics (CFD)
- Turbulence modelling
- CFD Renewables
- High performance computing
- Large eddy simulation
- Direct numerical simulation
- Marine hydro- kinematics energy extraction devices
- Aeroacoustics
- Fluid structure interaction

Andrea Cioncolini - Senior Lecturer in Thermal Hydraulics

- Experimental/computational thermal-hydraulics and thermal-fluid dynamics
- Microscale and macroscale two-phase flow
- Boiling
- Evaporation
- Condensation
- Heat transfer
- Computational fluid dynamics (CFD)
- Fluid systems transient analysis
- Nuclear reactor systems transient/safety analysis
- Flow-indiced vibration and flexible fluid-structure interaction

Tim Craft - Senior Lecturer in Mechanical Aerospace and Manufacturing Engineering

- Computational fluid dynamics (CFD)
- Turbulence modelling
- Development and application of mathematical models for predicting turbulent momentum and scalar tran

Hector Iacovides - Professor of Convective Heat Transfer

- Convective heat transfer
- Computational Fluid Dynamics (CFD)
- Turbulence modelling
- Experimental fluid dynamics
- Experimental heat transfer
- Rotating cooling passages
- Nuclear thermal hydraulics

Amir Keshmiri - Lecturer in CFD

- Computational fluid dynamics (CFD)

Dominique Laurence - Professor of Computational Fluid Dynamics

- Computational fluid dynamics (CFD)
- Smoothed particle hydrodynamics (SPH)
- Heat transfer in power plants, exchangers, turbines, combustors
- Aerodynamics of aircrafts, cars, trains, buildings
- High accuracy methods for representation of turbulence (direct and large eddy simulations)
- Coupling statistical (RANS) & deterministic (LES)
- Free surface flows, gridless methods (SPH)
- Code Friendly advanced RANS statistical models

Adel Nasser - Senior Lecturer in Thermofluids

- Turbulence modelling
- Computational fluid dynamics (CFD)
- CFD renewables
- Wind turbines, solar energy, turbulent combustion, development of micro/nano heat pipes

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Thermofluids (cont'd)

Robert Prosser - Reader in Thermodynamics and CFD

- Energy and multiphysics
- Computational fluid dynamics (CFD)
- Engineering design and optimisation
- Combustion
- Multiresolution (wavelet) methods
- DNS and LES
- Boundary conditions for Navier-Stokes problems
- Compressible flow and aeroacoustics
- External aerodynamics for motorsports applications
- Numerical methods
- Synthetic Eddy methods

Paul Watkins - Reader in Thermodynamics

- Energy and multiphysics

Tyndall Centre for Climate Change Research

Kevin Anderson - Professor of Energy and Climate Change

- Climate change
- Energy

John Broderick - Lecturer in Energy and Climate Policy

- Aviation
- Carbon budgets
- Natural gas
- Carbon trading
- Carbon offsets
- Climate change

Clair Gough - Senior Research Fellow in Energy and Climate Change

- Public perceptions of low carbon energy technologies, CCS, BECCS

Jaise Kuriakose - Lecturer in Climate Change

- Climate change

Alice Larkin - Professor of Climate Science and Energy Policy

- Climate change
- Low carbon transport
- Carbon capture and storage
- Agriculture
- Shipping and aviation emissions and climate policy
- Water-Food-Energy nexus
- Climate change mitigation pathways

Amanda Lea-Langton - Lecturer in Bioenergy Engineering

- Development of biomass and bioenergy applications
- Domestic biomass combustion and emissions
- Sustainable transport solutions
- Biomass with carbon capture and storage technologies
- Biomass for environmental remediation

Carly McLachlan - Senior Lecturer in Carbon Accounting

- Climate change
- Renewable energy socio-economics
- Energy demands and networks
- Stakeholder engagement with energy
- Renewable energy siting processes
- Pro-environmental behaviour
- Carbon management
- Food systems mitigation and adaptation to climate change

Alejandro Gallego Schmid - Lecturer in Circular Economy and Life Cycle Sustainability Assessment

- Life cycle assessment (LCA)
- Carbon footprint
- Circular economy
- Material flow analysis
- Social sustainability assessment
- Life cycle costing
- Multi-criteria decision analysis
- Material efficiency
- Solar photovoltaic technologies
- Wastewater treatment
- Developing countries

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Tyndall Centre for Climate Change Research (cont'd)

Maria Sharmina - Lecturer in Energy and Project Management

- Climate change
- Energy systems
- Emission scenarios
- Circular economy
- Climate and energy policies
- Low-carbon business models

Ruth Wood - Senior Lecturer in Environment and Climate Change

- Climate change
- Energy demands and net-works
- Built environment
- Low carbon transport
- Climate mitigation
- Infrastructure and societal resilience to climate impacts