



Loughborough  
University

# Department of Materials

**Dr Xujin Bao**

PG Programme Director

**Dr Fiona Hatton**

PG Admissions Tutor

# Accolades



Ranked 2<sup>nd</sup> in the UK for  
Materials

Guardian University Guide 2021  
Category: Materials and Minerals  
Technology

# Accreditations

This programme is accredited by the leading professional institute for Materials:



It is accredited as further learning towards Chartered Engineer (C.Eng):

# Our academics... teaching on the MSc programmes



**Prof Gary Critchlow**

**Dr Xujin Bao**



**Dr Jane Clarke**

**Dr Elisa Mele**



**Dr Sina Saremi**



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**Dr Fiona Hatton**



**Dr Hongtao Zhang**

**Dr Jamie Christie**



**Dr Simon Hogg**



**Dr Rebecca Higginson**

**Dr Helen Willcock**

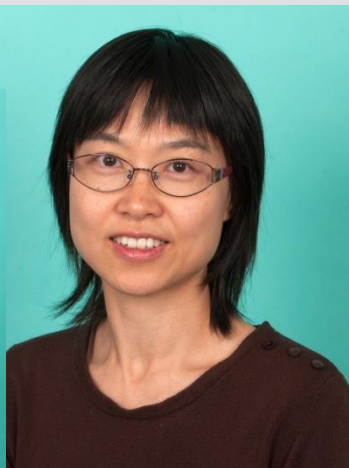


**Prof Jin Xuan**



**Prof Jin Xuan**

**Dr Anna Trybala**

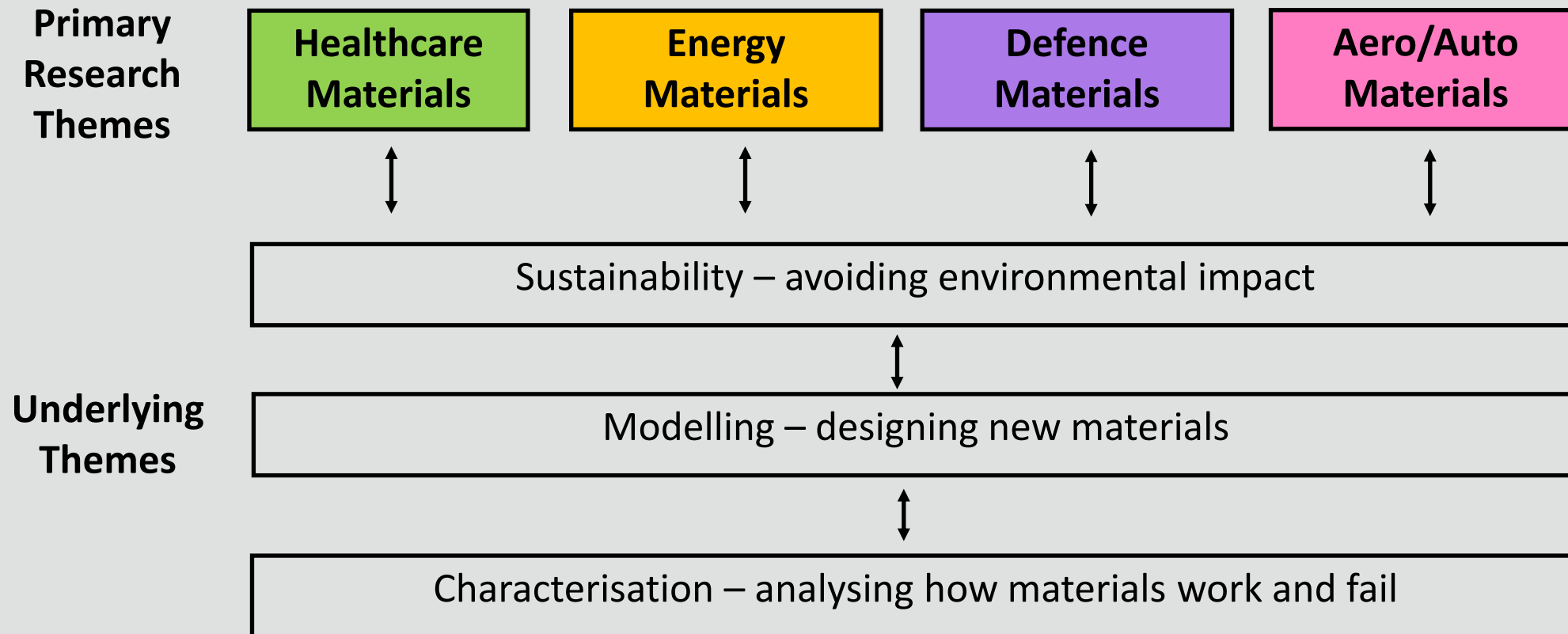


**Dr YauYau Tse**

# Research areas

## Our Materials research inspires our teaching

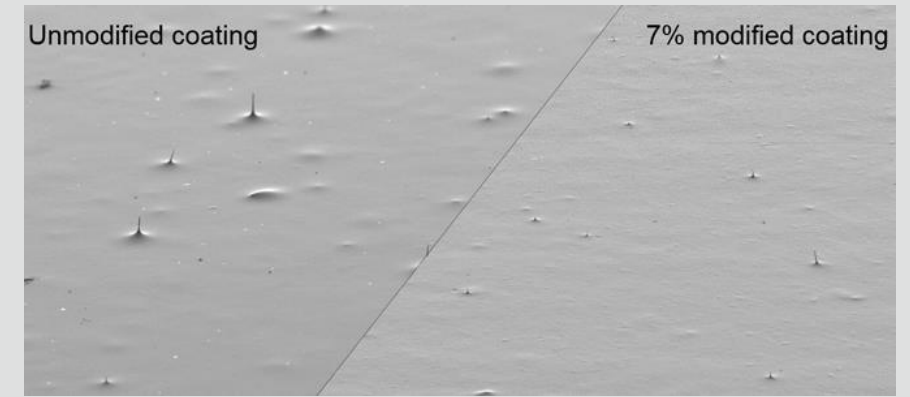
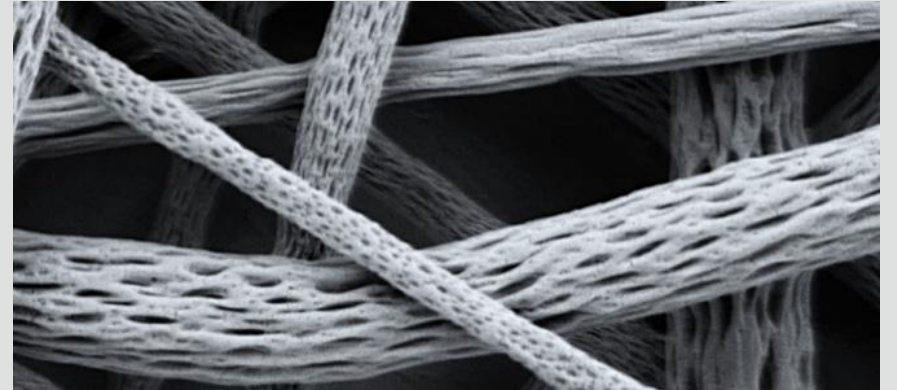
### Department of Materials Research Structure





# Research projects

- Bioactive wound dressings based on nanofibres.
- Whiskermit
- Understanding materials through multiscale characterisation
- Functional ceramics
- Nuclear and energy storage materials
- Material performance under extreme conditions
- Computational materials
- Structured Antibacterial Coatings
- Phosphate glasses for biomedical applications
- In-situ micro bend testing of SiC and the effects of Ga<sup>+</sup> ion damage



# Facilities

## £25M investment in our building and facilities

- State-of-the-art pilot Engineering facilities, with the addition of a new mezzanine floor level (polymer processing mezzanine and laboratory)
- 2 New IT Labs(87 and 36 workstations) for classes and private study
- All new research laboratories plus a new floor containing Biotechnology Laboratories
- **£17M STEMLab** – Totally dedicated to science and engineering teaching Laboratories
- **LMCC** – A World class facility with continual investment in the latest instruments e.g. £1.2M PFIB (plasma focussed ion beam) scanning electron microscope



# Programme introduction

We offer a choice between two comprehensive MSc programmes:

## Advanced Materials Science and Engineering MSc:

Spanning the major classes of engineering materials, the knowledge gained applies to a wide range of high technology industrial sectors including aerospace, automotive, power generation and distribution, IT, manufacturing and consumer goods amongst many others.

## Polymer Science and Engineering MSc:

An in-depth polymer programme, that covers polymer material selection, manufacture, testing, use and applications, as well as environmental impact both during production and at the end of life. Polymer experts are in short supply and in demand in many industries.



# Programme structure and assessment

MSc Full time study, 1 year (October 2020-September 2021)  
Part time study, up to 5 years  
180 credits (8 x 15 credit taught modules plus 60 credit project)

PG.Dipl Part time students have an option to study a reduced programme  
PG.Cert 120 credits (8 x 15 credit taught modules) PG.Diploma  
60 credits (4 x 15 credit taught modules) PG.Certificate

Assessed by a mix of exams, coursework and project dissertation. Exams take place twice per year January and June

# Programme structure: Modules

<b>Advanced Materials Science and Engineering - Full time study &amp; Part time</b>		
<b>Semester 1</b>	<b>Credits</b>	<b>Comp/Option</b>
Advanced Materials Characterisation	15	C
Research Methods	15	C
Clean Energy, Materials and Sustainability	15	C
Nanomaterials and Composites	15	O
Advanced Joining Methods	15	O
<b>Semester 2</b>		
Group Design Project	15	C
Advanced Processing of Materials	15	C
Materials Modelling	15	C
Advances in Biomaterials	15	O
Colloidal Science and Engineering	15	O
<b>Semester 1, 2 &amp; 3</b>		
Project	60	C

MSc programme normally 90 credits of compulsory modules and 30 credits of optional modules followed by a project worth 60 credits

# Programme structure: Modules

<b>Polymer Science and Engineering – Full time study &amp; Part time</b>		
<b>Semester 1</b>	<b>Credits</b>	<b>Comp/Option</b>
<b>Advanced Materials Characterisation</b>	15	C
<b>Research Methods</b>	15	C
<b>Polymer Science</b>	15	C
<b>Nanomaterials and Composites</b>	15	O
<b>Clean Energy, Materials and Sustainability</b>	15	O
<b>Semester 2</b>		
<b>Group Design Project</b>	15	C
<b>Advanced Processing of Polymers</b>	15	C
<b>Colloidal Science and Engineering</b>	15	C
<b>Materials Modelling</b>	15	O
<b>Advances in Biomaterials</b>	15	O
<b>Semester 1, 2 &amp; 3</b>		
<b>Project</b>	60	C

MSc programme normally 90 credits of compulsory modules and 30 credits of optional modules followed by a project worth 60 credits

# MSc projects

MSc Project – 60 credits,

- Substantial piece of research, including literature review, patent search, practical work, presentation and dissertation
- Students select a project from a varied list covering a wide range of topics
- Some industry sponsored
- Some part of bigger ongoing departmental research projects



# Examples of MSc student projects

- Advanced characterisation of polymer based viscosity modifiers
- Stimuli-responsive diblock copolymer nanoparticles by emulsion polymerisation
- New materials for additive manufacturing of ceramic green bodies
- Scratch-resistant colloidal coatings based on silica and polymer particles
- Biocompatible magnesium alloys as absorbable implant materials
- Accelerated aging of geotextiles and geomembranes
- Modelling thermal conductivity of polymers
- Microstructure and corrosion in welded Al alloys
- Development of ceramic ink formulations for 3D printing of batteries
- Compatibilization of recycled mixed polymers
- Functional material discovery and design using machine learning
- Biodegradable Polymer Blends

# Industry partnerships and collaborations

- Many industry sponsored research projects
- Many long standing consultancies and contract work for companies, especially characterisation
- Many industry experts involved with teaching on our modules
- An active Industrial advisory board helping to ensure we stay up to date.



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# Career prospects

## Major industry sectors:

- Aerospace
- Automotive
- Energy
- Consumer goods
- Medical devices, prosthetics and implants

## Typical job roles:

- Product development
- Technical management
- Project Management
- Customer technical sales/service
- Research

## Alternatively:

- Develop an academic career via research
- PhD Opportunities for MSc graduates
- Funding available depending on circumstances
- Each year a number of our graduates stay to undertake a research degree
- Many cutting edge research areas

# Our graduates



## Sicong

Graduated 2017

MSc Advanced Materials Science and Engineering

Innovation Project Manager

CEVT (China Euro Vehicle Technology)

Gothenburg, Sweden



## Antonio

Graduated 2017

MSc Polymer Science and Engineering

Polymer Development Engineer

Interface Polymers

Loughborough, UK



## Athena

Graduated 2014

MSc Advanced Materials Science and Engineering

PhD Surface chemistry and adhesion

Now working for GSK (Glaxo Smith Kline)

UK



## Tong

Graduated 2017

MSc Polymer Science and Engineering

Currently PhD Student

Research: Preparation and Characterisation of Garnet type Solid State Electrolyte by Cold Sintering Process.

Loughborough, UK



Thank you for listening

Any questions

please email Dr Fiona Hatton  
[f.hatton@lboro.ac.uk](mailto:f.hatton@lboro.ac.uk)