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Welcome to the Department of EEE

Dr Shanika Matharage

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Outline

- The Department
- Research Areas
- Research Themes
- Highlights in EEE
- PhD life in EEE
- What is a research degree?
- How to get started
- Progression, RTSG, GTA, etc.
- Support & Welfare
- Q&A

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The Department

- > 90 Academics
  - Various levels: Lecturers, Senior Lecturers, Readers, Professors with various backgrounds (EEE, Physics, Materials, etc.)

- > 1000 UG students

- **You are joining a community of over > 200 PhD students.**

  We are looking forward to your contribution!

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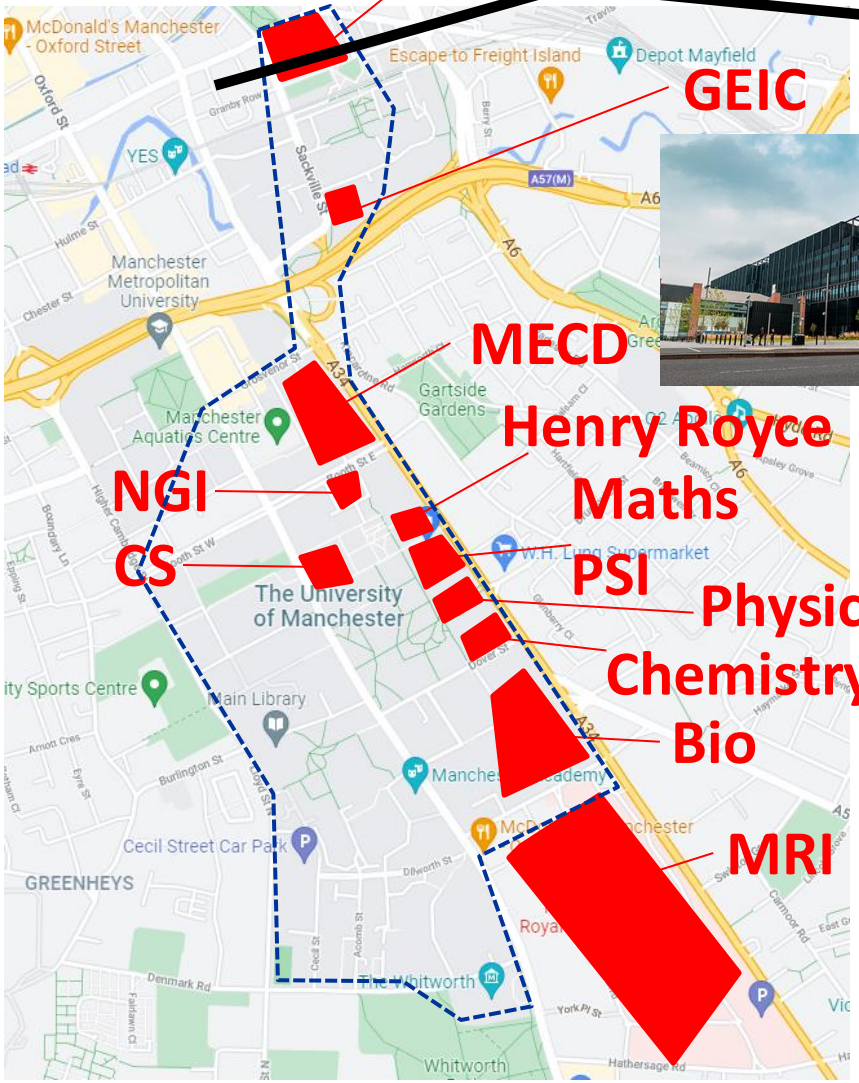
The Department

Cumbria







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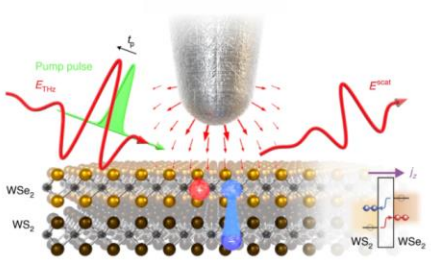
Research Areas



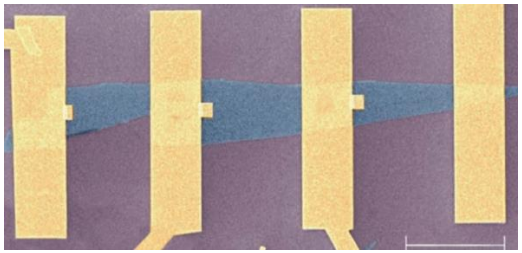
Solar energy



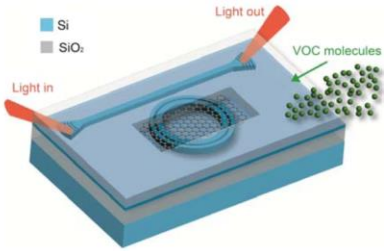
THz



(Compound) Semiconductors



2D-Materials



Photonics



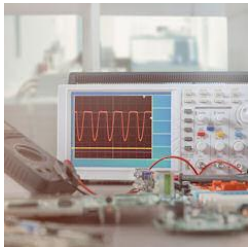
Autonomous systems



Communication



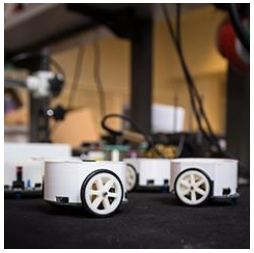
Control



DSP



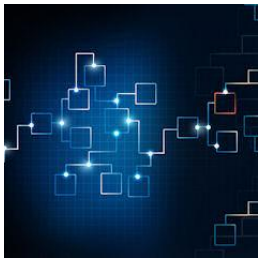
Power electronics



Mechatronics



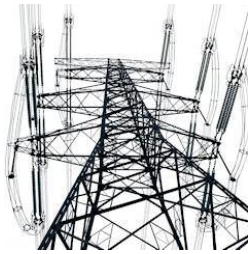
Sensors



Systems integration



Energy Networks



High voltage technology



Power conversion

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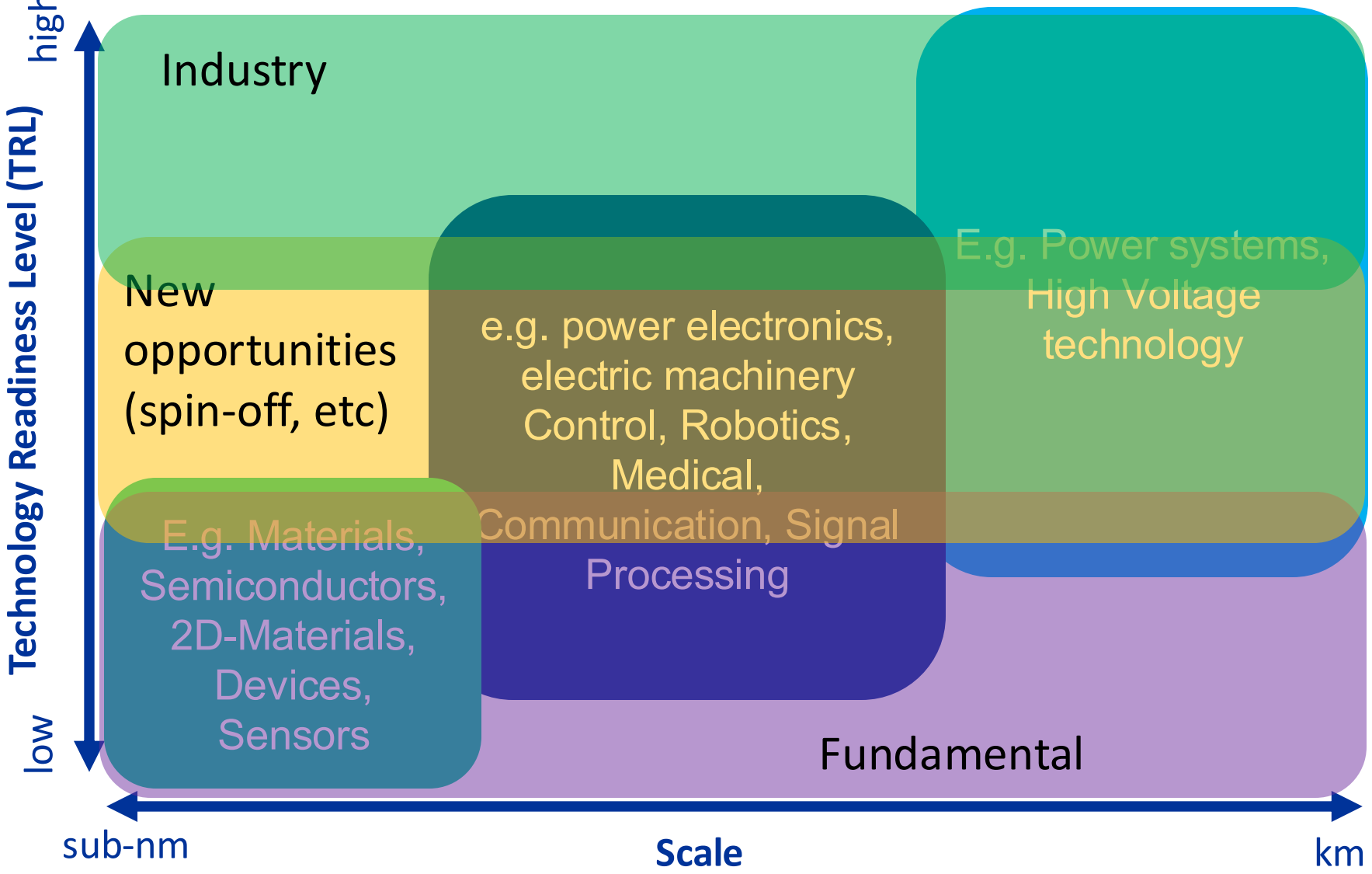
Research Areas



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Research Themes

Over-arching research themes

- Advanced functional materials & devices



- Electronic Engineering for Agriculture



- Resilient energy systems



- Robotics for extreme environments



- Sensing technologies for security



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Highlights

Powerhouse EEE:

- Highly successful in attracting research income from research councils & industry
  - E.g. Nanoscale Advanced Materials Engineering (NAME) is the largest Programme Grant awarded by EPSRC (~£10M + ~£5M partner support)
  - Collaborations with major industrial partners, e.g. Airbus, Siemens, Rolls-Royce, National Grid…

- Detecting landmines for a safer world
  - EEE major player in developing new sensors



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Highlights

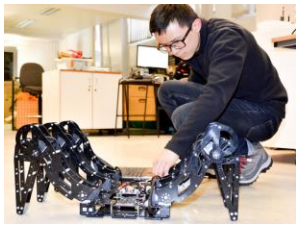


Powerhouse EEE:

- Spin-outs: Signal wizard - real-time digital signal processing systems for the music industry, research institutions and industry
  - Customers include NASA, Disney and the Canadian Navy



- Machine learning, e.g. Deep learning of variations in facial expressions

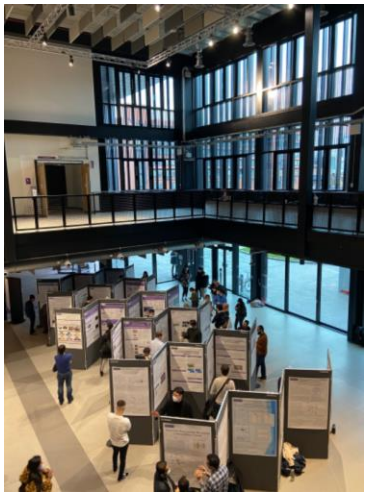


- Robotics for nuclear environments

PhD life in EEE

- Community of PhD students
  - Embedded in research groups
  - Seminars
  - Yearly Poster Day
- Social events
  - Meals/drinks
- Feedback
  - Staff-student-liaison-committee
- Training
  - Technical, Research skills, paper/thesis writing,…
- Societies

Poster Day in MECD ‘21



Writing retreat at Gradbach Mill ‘22



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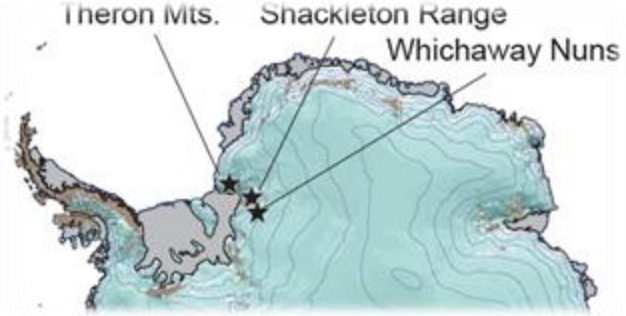
PhD life in EEE

Unique opportunities:
Collecting meteorites in the Antarctic!











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PhD life in EEE

Internships with the Government

UK Parliament POST

POSTNOTE
Number 655

Energy Sector Digitalisation



Digitalisation of the energy sector can support progress towards key UK objectives, such as decarbonisation to achieve Net Zero emissions targets. More broadly, digital technologies may also present both opportunities and challenges by transforming the way energy is generated, transmitted, regulated, and traded, as well as changing how consumers use energy.

Overview

- Energy sector digitalisation refers to the integration of digital technologies into systems such as generation plants, electricity networks and consumer meters.
- Artificial intelligence, the Internet-of-Things, distributed ledgers, and other technologies, could drive novel business models, incentivise economic growth and improve consumer experiences.
- Digital technologies will require greater access to data and combining of datasets collected by different energy stakeholders.
- Other challenges include protecting consumers' privacy and risk of cyberattacks.
- Certain initiatives have suggested possible approaches to improving data practices, enhancing cyber security resilience, and promoting innovation in the energy sector.

Background

'Digitalisation' refers to the incorporation of digital technologies within a sector.[1,2] In the past decade, there has been increasing use of digital technologies in the energy sector, including the use of digital sensors in electricity networks for supply monitoring and the installation of smart meters for analysing

energy systems to be connected together (such as electricity transport, and renewables) leading to improved efficiency[21–24] as well as greater consumer choice and improved services.[25,26]

Digitalisation is featured prominently in the UK Government's 2020 Energy White Paper and 'using digital innovation to reach

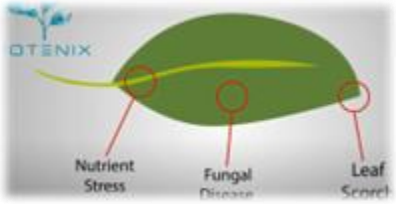


After graduation

Where do our graduates go?



- Academia
  - Moving on to PDRA/Postdoc or even Professorial positions around the globe
- Industry
  - Various positions ranging from research to managerial roles
- Founders of spin-out companies
  - E.g. Fotenix Ltd (Dr Charles Veys) – Focussing on the eAgri-Food sector, Fotenix was founded by Charles after coaching through the University and is now progressing towards a multi-million pound investment.





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What is a research degree (PhD, EngD, MPhil)?

- “the candidate possesses an appropriate knowledge of the particular field of learning within which the subject of the thesis falls;”
- “the research which is reported in the thesis contributes an addition to knowledge;”
- “the results of the research show evidence of originality and independent critical judgement;”
- + …

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What is a research degree (PhD, EngD, MPhil)?

- “the thesis is presented in a lucid and scholarly manner;”
- “the thesis has been submitted in the form prescribed by University Regulations;”
- “no part of the thesis has previously been submitted for the award of a degree at this or any other University;”
- “the thesis and the work reported in it are the candidate's own.”

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How to get started?

- ‘Kick-off’ meeting with your supervisor/supervisory team
  - More detailed discussion about your project (beyond the short project description you have submitted during the application)
  - Establish work plan for Y1 and what is expected of you
- Meet your advisor
- Lots of reading…
- Arrange trainings, inductions, etc
- Arrange to meet with other PhD students in your group/area

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How to get started?

Reminder:
This is a research degree, not a taught one!

- Nobody will tell you anymore precisely what to do
- You will need to drive and push your own research
- Don’t sit back and wait
- You need to be able to put your own research into the bigger context, nationally and internationally
- Your supervisor will not be able to answer every question → this is research! But the supervisor provides guidance on how questions can be best approached and answered
- You are supposed to be the expert in your field after 2-3 years, not your supervisor

Progression

Year 1

Project plan, trainings, literature review, first experiments…



Start Month 9 Month 12

- It is important that you make progress in your research
- eProg is used to record progress – keep it up to date
- Progress report at 9 months – examined with viva
- May need extra work – this needs to be completed before the end of the year (re-examined)
- Register for the next year (in the same month as you started)

RTSG

The Research Training Support Grant (RTSG)

- You all receive a RTSG (~ few £k) over your research period
  - Intended for conferences, trainings, small consumables
  - To be spent during the research period, not in submissions pending (writing up)
  - When it's gone, it's gone
  - You will receive your personal finance code for this to e.g. book travel and order → needs to be approved by supervisor/PGR Director
  - **All travel bookings through the EEEOps team!** Follow process (forms to fill, etc.). Guidance will be sent out. EEEOps@manchester.ac.uk

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Research facilities

Access to various research facilities possible:

- Welcome and Introduction to FSE facilities (Prof. Perdita Barran)
- PPMS Introduction and user guidelines (Dr. John Warren)
- Introduction to Elemental Analysis and Physical Characterisation (Dr. Ilya Strashnov)
- Introduction to Mass Spectrometry and Separations (Dr. Katherine Hollywood)
- Introduction to Electron Microscopy (Dr. Matthew Smith)
- Introduction to Laser, Optic and Electronic (Dr. Samantha Hardman)
- Introduction to Magnetic Measurements (Dr. Matthew Cliff)
- Introduction to X-Ray Diffraction (Dr. Colin Levy)

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GTA

Graduate teaching assistant (GTA)

- Opportunity to get teaching experience
  - Assist with UG, CDT, etc. teaching
  - Labs, Y1 tutorials, marking, etc.
- Extra income (~£18/h)
- Speak to your supervisor for advice
  - What courses?
  - How many hours?
  - …

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Important documents

- The University of Manchester Postgraduate Research degree regulations
- The University of Manchester Code of Practice for Postgraduate Research Degrees
- The University of Manchester Student Complaints Procedure
- The University of Manchester Guidance for Students on plagiarism and academic malpractice
- The University of Manchester Research governance, ethics support and guidance
- The University of Manchester Guidance on academic appeals

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Important documents

- The University of Manchester Code of Practice for dealing with allegations of misconduct in research
- The University of Manchester Intellectual Property (IP) resource
- The University of Manchester Policy on Dignity at work and study

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Support & Welfare

Student support & advice on campus



Support & Welfare

Student support & advice on campus

Supervisory team/ Academic advisor

Supervisory team

- Day-to-day business
- Less suited for administrative issues

Advisor

- Not involved in your research
- Independent “friend” to raise issues you might not want to discuss with your supervisor
- General advice
- Meet them for a coffee!

Support & Welfare

Student support & advice on campus

Student support & Advice

PGR student support Hub in MECD

- 4th floor Nancy Rothwell Building
- If they can't help directly, they will find you the right person
- Administrative issues
- Anything else!



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Support & Welfare

Student support & advice on campus

Disability Advisory and Support Service (DASS)

Range of support available

- Exam/viva concessions (where applicable)
- Assistive Software
- Specialist Equipment
- Note taking support
- Lab support
- One to one study coaching
- Mental Health Mentorship
- Asperger's Syndrome/ Autism Mentorship



DASS (Confidential service)
University Place 2nd Floor
dass@manchester.ac.uk
Tel: 0161 275 7512

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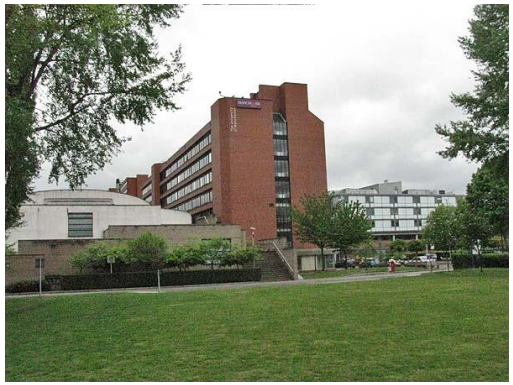
Support & Welfare

Student support & advice on campus

Counselling service

A range of support is available for students experiencing anxiety or low mood including:

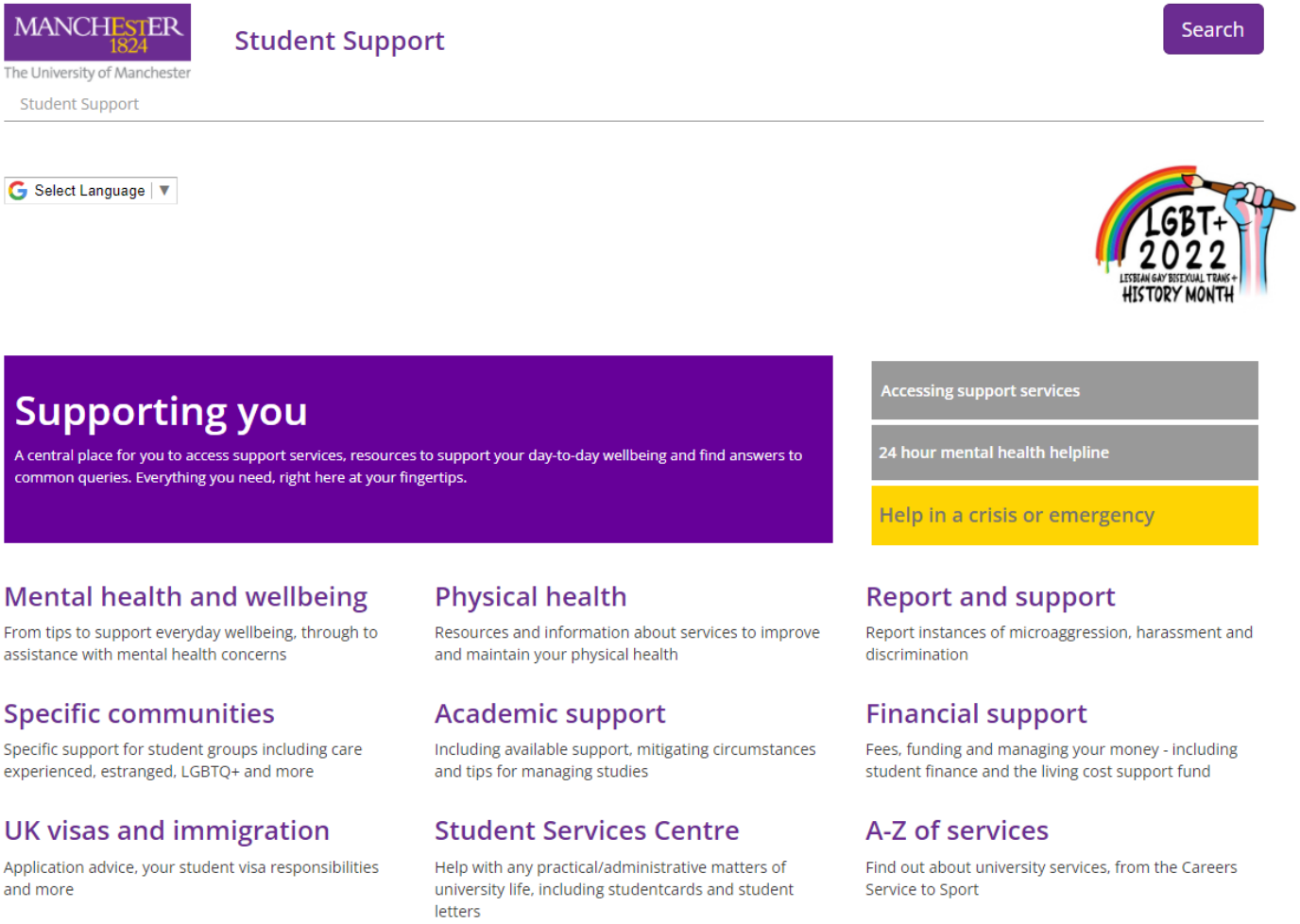
- Online Cognitive Behaviour Therapy techniques
- One-to-one counselling
- Wellbeing Workshops and Courses
  - Managing Procrastination
  - Managing Exam Stress
  - Challenging unhelpful thinking habits
  - Working well in groups
  - Learning to Sleep Better
  - Managing low mood/ anxiety



5th floor – Crawford House

Support & Welfare

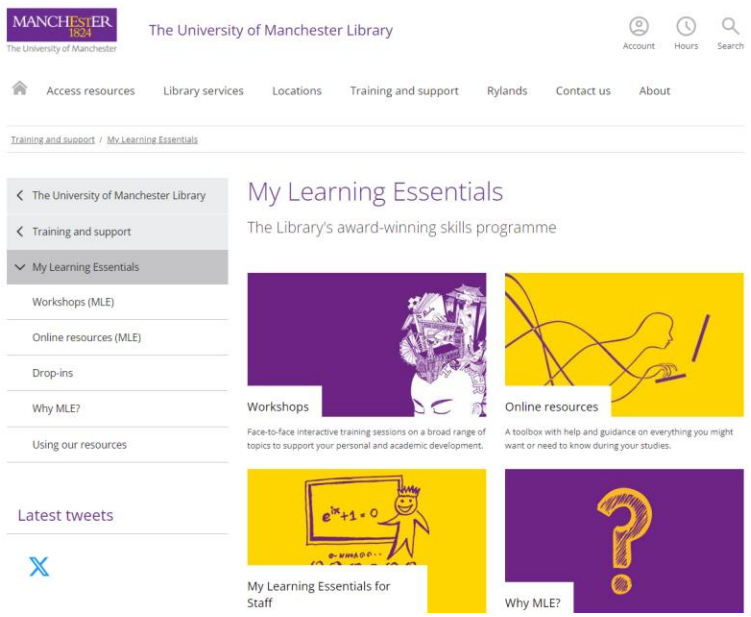
Student support & advice online (www.manchester.ac.uk/ssa)



Support & Welfare

My Learning essentials

- Comprehensive programme of online resources, workshops and skills clinics designed to support you in your personal and professional development.
- Workshops and drop-ins
- Online resources
- Run by the University Library
- Drop in sessions at Ali G Learning Commons



https://www.library.manchester.ac.uk/training/my-learning-essentials/

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Q&A