University of Nottingham
Nanoscale and Microscale Research Centre

ROYAL SOCIETY OF CHEMISTRY

Under the Microscope

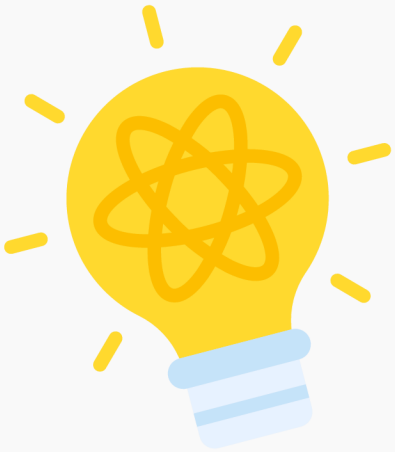
LIVE

Resource and information pack

for teachers

A mealworm!

Contents



Welcome Message

Thanks for expressing interest in Under the Microscope LIVE! We are so excited to share the fascinating technique of electron microscopy with young people across Nottinghamshire. Ever since I captured my first electron microscopy image back in 2016, I have been captivated with the technique and knew if I'd been shown it at school, it would have sparked my scientific curiosity even sooner!

Dr Luke Norman

Under the Microscope LIVE creator

Introduction to Under the Microscope LIVE

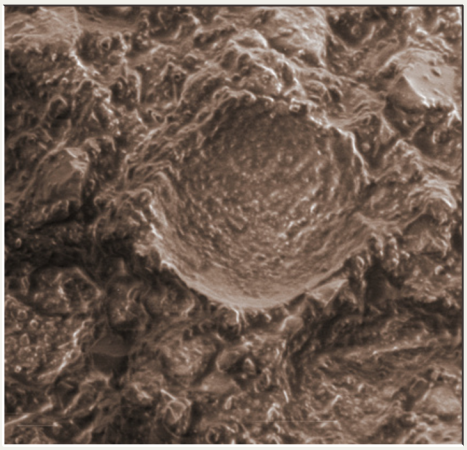
Welcome to your Under the Microscope resource pack, we can't wait to start our sessions with you and your students!

Included in this pack is some information on the background of the Nanoscale and Microscale Research Centre, and how Under the Microscope LIVE started.

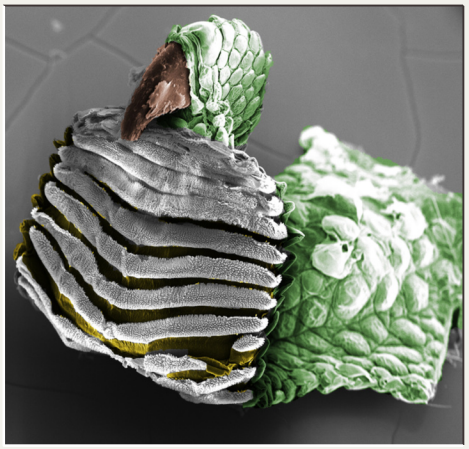
The main aim of this Royal Society of Chemistry funded project is to inspire future scientists by showing them a career that does not necessarily require a degree to be part of and demonstrates the wonder and multiple length scales of materials chemistry.

Electron microscopy is not broadly available to younger audiences but can show how the microscale structure of objects can look vastly different from what we see by eye and explains material behaviours.

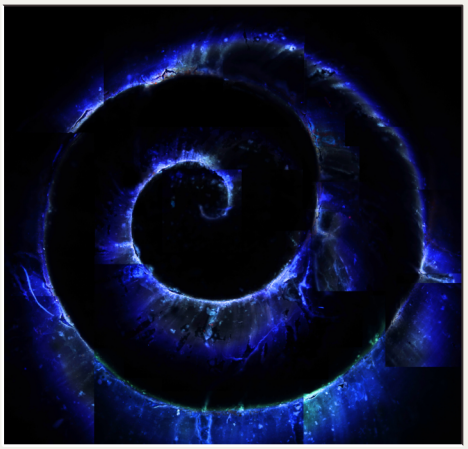
Since chemistry can be defined as the study of the composition and structure of substances, Under the Microscope LIVE develops a natural curiosity to learn more about the world around us.



Chocolate



Lizard scales



Snail shell

Examples of Under the Microscope submissions

Nanoscale and Microscale Research Centre

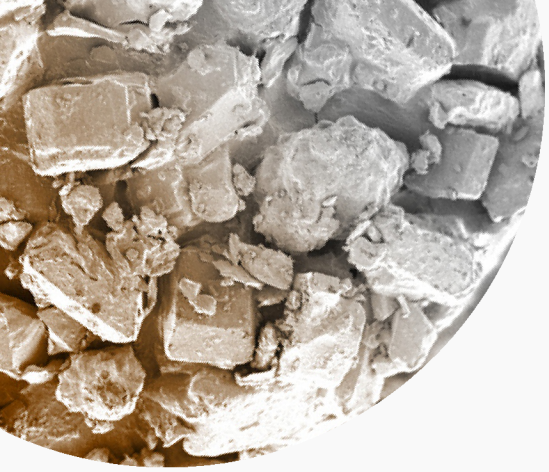
The Nanoscale and Microscale research centre (nmRC) is a cross disciplinary facility that opened in April 2016. The centre is dedicated to supporting world leading nanoscience and materials characterisation, specialising in techniques such as electron microscopy. The nmRC has welcomed students of various age groups to engage with work experience/shadowing days.

We have also delivered content and activities that have included demonstrating the different types of microscopy. Our outreach is not limited to mainstream educational facilities; the team can adapt materials to all age ranges and abilities and are passionate about introducing to the world of microscopy to people of all backgrounds and ages.

Royal Society of Chemistry

The RSC is a society that believes that everyone should have access to a high quality chemistry education that's engaging, stimulating and relevant. Queen Victoria granted a Royal Charter to the society, confirming it's purpose of " the general advancement of Chemical Science".

The RSC has a mission to empower communities to offer an excellent chemistry education to all, driving greater diversity and improving skills in the chemical sciences.



Fizzy cola bottle

How it all started

2023

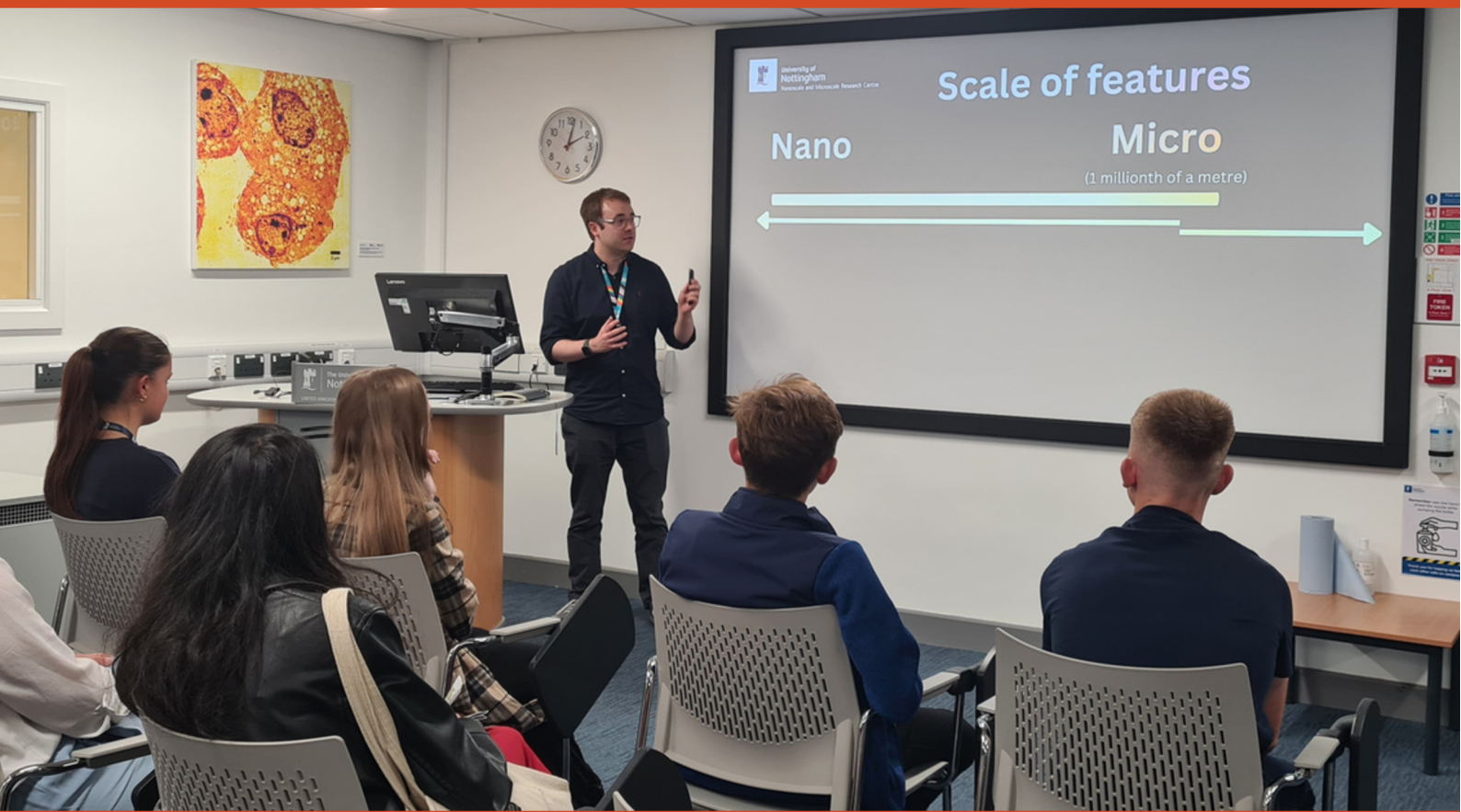
Under the Microscope was first launched in March 2023, we asked members of the general public to submit there ideas and we were not disappointed. In the last year we have imaged everything from a Porcupine quill to Shortbread biscuits! Scan the QR code above for a video review of our first year!

2024

In February 2024 we took part in the Nottingham Festival of Science and Curiosity, which allowed us to engage with local children and introduce them to the fascinating world of microscopy. The students were engaged and surprised with the results from their suggestions which included a pairs of crocs and a fizzy sweet. To continue this we applied for funding from the RSC and were successful!

How does it work?

Through an innovative hybrid in-person and live streaming format, students will have the opportunity to explore microscopic structures and objects of their choosing, engaging them in hands-on scientific inquiry and sparking curiosity about the structure and composition of the unseen world around them.



The sessions

The project prioritises student involvement by asking for suggestions of objects to be imaged in advance of the LIVE session (via a video call), ensuring that the LIVE content is then relevant and captivating for the participants.

There will be 3 sessions (2 interactive, 1 presentation) in total

1

An online discussion with the class explaining the concept and asking for sample suggestions.

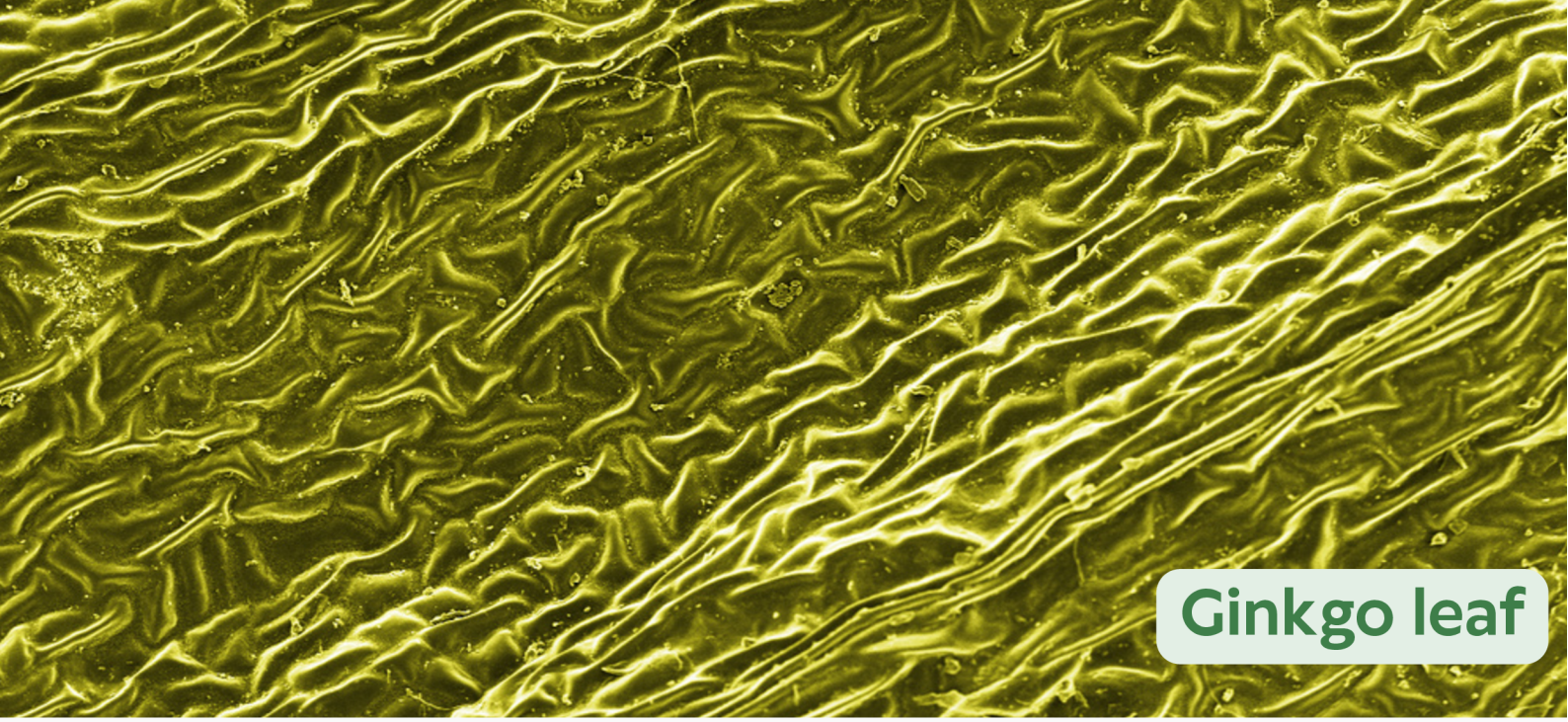
2

Live electron microscopy in the classroom.

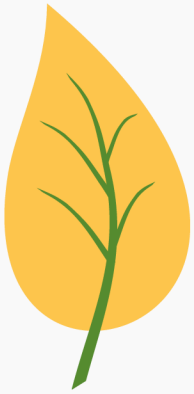
3

An image that was taken during the session will be turned into a canvas, and presented to the class.

Each session will utilise 1-2 members of staff operating the microscope using our bespoke audio-visual setup, whilst an additional 1-2 staff members will be at the school with a microscopy toolkit, explaining how electron microscopy works.



Which objects can be selected?



There are 3 basic rules of picking a suitable object for electron microscopy:

1. **Only solid objects (as the analysis takes place in a vacuum)**
2. **Must be obtainable**
3. **Cannot be alive ..... you would be surprised at some of the previous suggestions!**

The team

Organisers

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Microscopists and presenters

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Dr Long Jiang
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