

# sources

MICROSCOPE USERS' GROUP; SUBJECT ADVISER CONTACT DETAILS;  
SUMMER SCHOOLS PROGRAMME; CALVERTON & DISTRICT u3a PROMOTIONAL VIDEO



Filters show the 'Maltose cross' structure of potato starch. Right: Diana Stephens takes a close look



## Alternative focus helps put life under the microscope

Northampton u3a Microscope Users' Group examines items ranging from food and blood to eyelash mites. Here, *Joanne Smith* gets the lowdown from group leader **Mike Gibson**

**M**any u3a group leaders go above and beyond to provide a great experience for their members. For Mike Gibson, this meant going to bed with Sellotape on one of his eyebrows. The aim of his dedication was to capture hair follicle mites.

"Demodex are a species of parasitic mites that live in the base of eyelashes," explains Mike. "They are most active at night, emerging from inside the hair

follicles around the eyebrows and eyelashes to feed on dead skin cells. They are generally harmless unless you get too many, which can lead to irritation and skin rash."

An excellent subject for investigation under a microscope, but how do you capture them?

"I had been experimenting and the best way was to place a bit of Sellotape across one eyebrow and leave it overnight," says Mike. "I peeled it off the next day and soaked it in distilled water to release any captured mites. Looking at them under the microscope, it was evident that some of the mites were still alive."

The following day, members of Northampton u3a Microscope Users' Group were able to observe these

wriggling critters, which appeared quite grotesque when viewed close up – "rather like something out of one of those *Alien* films" according to Mike.

Mike is a former science teacher, health educator and fellow of the Royal Microscopical Society. When he set up the Microscope Users' Group ten years ago it was an instant hit with u3a members, the majority of whom were beginners keen to learn new skills and try something different, as well as some who had previously worked in laboratories and wanted to add to their existing knowledge.

Initially, one major problem for Mike was finding a suitable location where the group could meet. And while some members had their own microscopes, >

FOR MORE INSPIRING STORIES, VISIT [sources.u3a.org.uk](https://sources.u3a.org.uk)



Left: Mike Gibson sitting at the microscope with Christine Ashby. Right: Slicing off a tomato skin with a razor for examination. Below: The make-up of an onion seen using brightfield illumination



others needed to borrow equipment. Luckily, Mike is a member of the Northamptonshire Natural History Society, based in the centre of Northampton, and the group is able to meet there once a month and use the facilities and equipment.

The society was formed in 1876 and has had many famous members, including Charles Darwin and the family of Francis Crick who, along with James Watson, discovered the structure of DNA.

"From the outset, we emphasised to our u3a members that this is a beginners' group and therefore no previous experience or knowledge was necessary," continues Mike. "The essential idea was to discover, learn and have fun."

The group has studied a wide variety of subjects, from leaves and pollen to the structure of hair and bacteria. Using

*“In a drop of milk we saw the tiny fat globules jiggling about. This is called Brownian motion”*

low-power stereo microscopes, members have also examined Japanese star sand, as Northamptonshire Natural History Society has the largest collection of sand in the UK. They were surprised to learn that the star-shaped grains – one of the world's rarest forms – are made up almost entirely of shells once inhabited by tiny living organisms called foraminifera.

Recently, the group also looked closely at food samples.

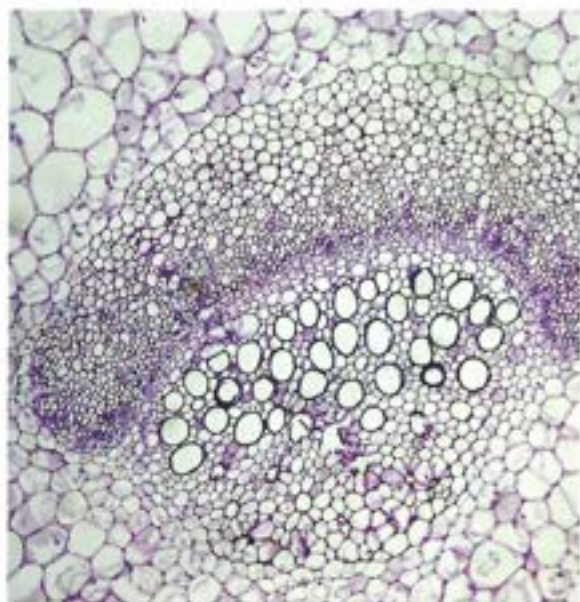
"In a drop of milk, for example, we saw the tiny fat globules jiggling about," says Mike. "This is known as Brownian motion, where atoms and molecules too tiny to see move the fat globules around."

Tomato skin cells appeared like "lattice work – neat paving stones that were almost square", while the starch grains in potato were "quite beautiful" when viewed with polarising filters.

The group even cut cross-sections of celery with razor blades. "That was quite fun," explains Mike. "They had to make the cross-sections as thin as possible and then stain them with blue dye to see the vascular bundles that transport food and water."

Members learn how to prepare slides and take photos with their

&gt;



Clockwise from above: Tiny circular bundles of vascular tissue in celery; members learning a range of techniques; Mike's microscope view projected on to a TV screen; and some items from animals and nature to be examined



smartphones or cameras down the eyepiece of the microscopes to record what they are seeing. When looking at a blood sample, for example, they discovered that Quink ink used in fountain pens is an excellent stain that makes it easier to differentiate between various types of blood cells, especially the lymphocytes.

Early work included looking at squamous epithelial cheek cells from inside the mouth and making simple slides with the blue dye.

"Under the microscope it was possible to make out the plaque bacteria that often form as a biofilm on each cell's outer membrane. This led to further work on bacteria by some of our members in making their own bacterial slides from yoghurt," says Mike.

"In another session, we had great fun

*“It is like going on a voyage of discovery – you don't know what you will find”*

making leaf peels, which is a relatively simple technique using clear nail varnish painted over part of the leaf surface. Once dry, the varnish is peeled off with Sellotape and stuck on to a glass slide which can then be viewed under the low-powered lens of a microscope.”

Some of the group took part in a citizen science project, sampling and recording

microscopic life found along various stretches of the nearby River Nene.

"We were particularly looking for a specialised group of single-celled phytoplankton known as diatoms," Mike says. "Each diatom is contained within a glass-like outer shell called a 'test' that is formed out of silica and collectively they are quite beautiful under a microscope.

"They help oxygenate the rivers and seas, and there are blooms of them in the oceans that can even be seen from satellites orbiting Earth."

As well as practical sessions, the group enjoys a varied programme of talks, discussions and online videos.

"Members are astonished at what they see," says Mike. "Using a microscope is like going on a voyage of discovery – you don't know what you will find. We really do learn, laugh, live."