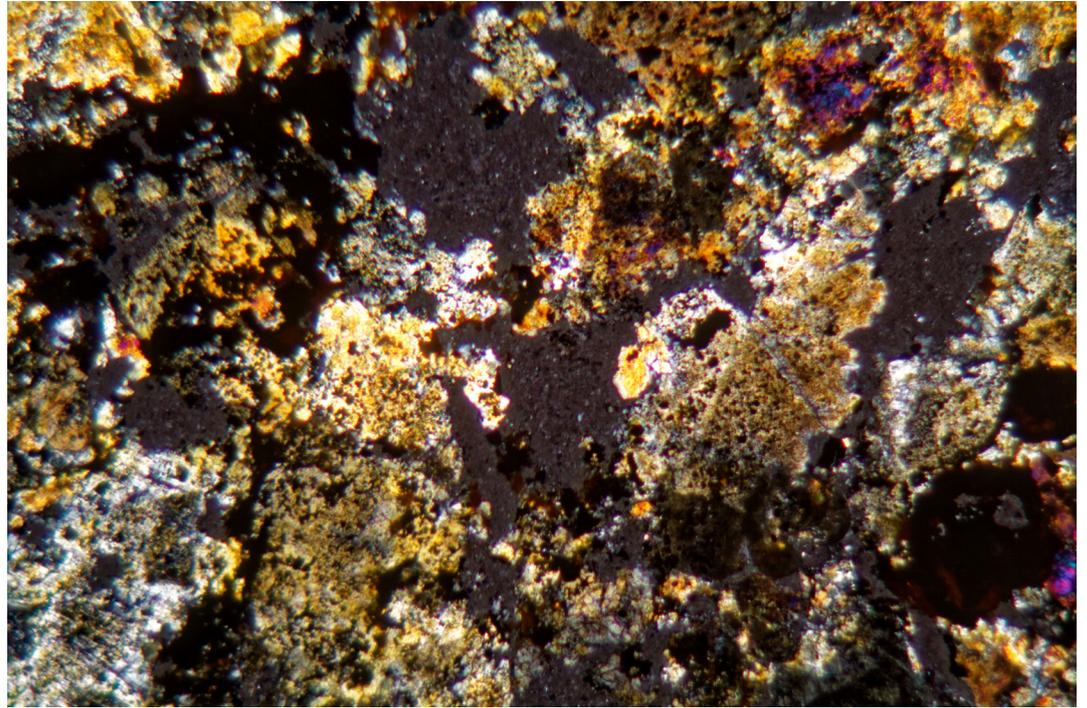




# Microscope protects samples from contamination



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At the British Geological Survey ([www.bgs.ac.uk](http://www.bgs.ac.uk)) in Keyworth, Nottingham, UK, a meteorite sample or terrestrial mineral grain under analysis may already have had more than £1,000 of laboratory time and effort invested in it prior to high precision mass spectrometric analysis. Even slight contamination during sample preparation would render an analysis compromised and potentially useless, so great care is taken in the lead geochronology clean chemistry laboratory, one of the clean room suites at the Geochronology and Tracers Facility, to eliminate airborne particulate contaminants from laboratory air and also potentially from instruments within the laboratory. To

facilitate this and to improve workflow, a classic microscope has been replaced with a new Nikon Metrology ([www.nikonmetrology.com](http://www.nikonmetrology.com)) SMZ745 binocular model with a zoom range of 0.67x to 5x and its generous working distance of 115 mm.

The Geochronology and Tracers Facility is a national facility that specialises in applying a range of isotope techniques to geological materials in order to date specific rocks and minerals. Additionally at the facility, measurements of the isotope composition of elements such as silicon, strontium, neodymium and lead are also used as tracers for a range of geological and environmental processes. Analytical results and their interpretation depend upon exacting sample preparation, examination and characterisation, with microscopy being an important and essential part of this activity.

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Dr Stephen Noble, Geochronology research scientist

## Microscope protects samples from contamination

Geochronology research scientist Stephen Noble said, "The main issue we face with chemistry laboratory equipment is that some exposure to acidic conditions can take place during sample preparation in a clean air environment and over several years this results in corrosion.

"Our laboratory uses various microscopes including a macroscope-type device, polarising petrographic microscopes and stereoscopic microscopes of various ages."

"In our clean labs microscopy is essential in facilitating the manual transfer via pipette of minute mineral grains weighing about one microgram and measuring up to 100 microns into ultra-clean vessels for acid cleaning and subsequent dissolution as part of the analytical workflow.

"One of our older microscopes was corroded on its metal parts as well as being rather too large for the working space and both factors resulted in it being no longer suitable for use in the clean lab due to the sample contamination risk."

For this reason, the facility wanted to replace the instrument, which when inspected was also found to have lenses that had degraded to a point that likely contributed to some samples being lost. Dr Noble advised Nikon that the main attributes the new microscope needed to have were very good optics, a large working distance to permit sample manipulation and to keep the objective well clear of the sample, a good quality LED light source, a compact design to fit comfortably within a high-efficiency particulate air-filtered (HEPA) workstation in the clean room, and importantly a very robust construction.

"Although within our group there is a lot of microscopy experience, setting up of the 'scope by Nikon Metrology staff was useful and the training provided was very good, helping us to be up and running quickly."

Dr Stephen Noble, Geochronology research scientist

The Nikon SMZ745 was selected from the shortlisted devices owing to it meeting the above criteria and at a reasonable price. Another feature of this microscope model is an air-tight construction, which prevents ingress of dust, oil, water and chemicals, protecting both the microscope and the sample under observation. The anti-fungal coating developed by Nikon - for the interior optical parts ensures the absence of spores, while static electricity that builds up within the microscope is discharged almost instantly, ensuring that the charge cannot attract and repel particulates.

Dr Noble added, "The new 'scope is easy to wipe down, further reducing risk of damage due to chemicals in the clean laboratory and contributing to a particulate-free, low-contamination environment for the samples. Moreover the compact design

makes working in the clean air workstation much easier."

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Summarising the benefits of the new purchase, he listed reduced sample loss during handling, greater ease of manipulating samples and elimination of particulate contamination traceable to an older example microscope. Additionally, the better optics of the SMZ745 compared to the previous microscope result in faster and more secure sample transfers between the different laboratory Teflon ware used in the sample preparation process. It has resulted in the British Geological Survey's scientists, students and post-doctoral fellows being less tired from a long stint in the facility.

Based on collected samples, the British Geological Survey monitors, analyses, interprets and characterises geological environments, both nationally and internationally, building strategic partnerships with academic institutions, governments, industry and the public to develop its work and share its expertise. It is the UK's premier provider of objective and authoritative geoscientific data, information and knowledge for helping society to use its natural resources responsibly, manage environmental change and be resilient to environmental hazards. In today's climate-conscious world, the organisation's importance cannot be overstated and Nikon Metrology is playing its own part to assist in the valuable work.



Even a minute amount of airborne particulate matter in a laboratory clean room is catastrophic when conducting geochronology research. The new Nikon Metrology SMZ745 binocular microscope at the British Geological Survey ensures that contamination is minimised to negligible levels.