

## Microscopy, Microtechnology & Image Analysis

### Surveying Sites for Electron Microscopes

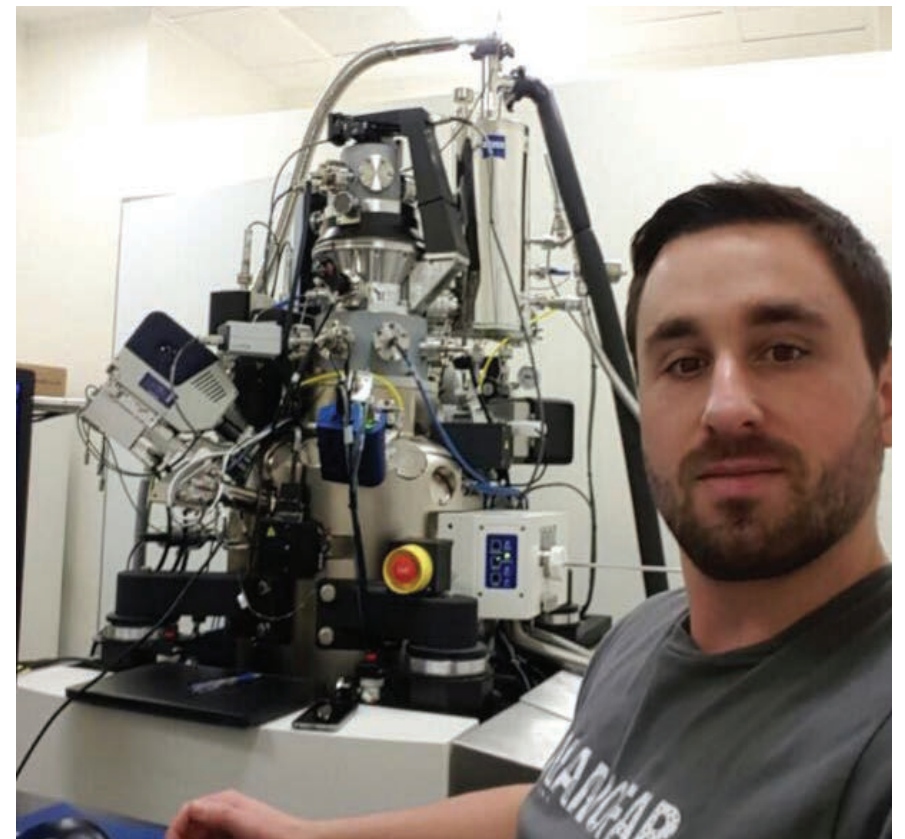
Hsiu-Yi Ouyang, Head of CRM, Spicer Consulting

Complex electron microscope systems are widely used in research laboratories to investigate the structure of various biological and inorganic structures, but interference from magnetic fields and acoustic fields can affect image resolution. Internationally renowned optical expert Zeiss uses sophisticated surveying equipment to inspect sites prior to system installation.

Zeiss is a world leading manufacturer of optical systems, providing a wide range of services and products to four main business sectors; semiconductor production, research and quality technologies – such as microscopy – medical devices and vision care. Within its microscope range, Zeiss produces and installs complex scanning electron microscopes (SEMs) that deliver high resolution surface information for life sciences and materials research. Various criteria must be considered before installing one of its high tech systems, as Christian Hegele, International Service and Support Engineer at Zeiss, explained: “Before we set up one of our electron microscopes, it is very important that the site is adequately surveyed to ensure that the room is big enough, and to check for interference that could affect the quality of the images that the system can produce. Electronic and acoustic interference, as well as floor vibrations, can have a huge impact on the performance of electron microscopes and, as they are expensive pieces of equipment, it is crucial to detect any problems that may arise in order to provide a solution.”

“We have been using the SC11 Sensor Interface Analysis System from Spicer Consulting since 2008, which allows us to survey the environment and check if laboratories are suitable prior to installation. Results are clearly displayed graphically on connected laptop screens, allowing us to reliably assess the area. We have created templates specifying the requirements of each of our microscopes, which can simply be opened and run on the SC11 system using the Spicer Wizard software; everything is automated making it extremely easy to use, even for less experienced service engineers. The templates are available online, so all our engineers around the world can access them. It’s an excellent way to standardise the service that we provide, and allows us to have confidence that each survey will be performed with accuracy and reliability. The majority of our service engineers are now using Spicer equipment, which means that we can ensure consistently high quality results, and that everyone is familiar with the benefits of the systems.”

Christian continued: “Before I started performing site surveys, a former service engineer – who had worked with Spicer for years – recommended its systems, and introduced me to them. I went on a two-day course organised by the company, which gave me the knowledge to train our own engineers; it was really interesting and the products were fantastic. We are now working on establishing a training programme in house for new engineers, or those switching over to the Spicer systems. We also use Spicer’s purpose-designed SC22 Magnetic Field Cancelling Systems, which reduce AC magnetic fields in the environment to increase resolution and accuracy of our SEMs. When surveying our customers’ sites, we often recommend the SC22 to enhance the performance of our systems, as they are incredibly effective at removing interference.”



Christian Hegele with a Zeiss SEM set-up

“We work extremely closely with Spicer in order to deliver the best possible service to our customers. Both the SC11 and SC22 are intuitive and easy to use, and any problems we’ve encountered or changes that we have wanted to make to the systems have been quickly and efficiently addressed. We have an excellent relationship with the team after years of using their products, and are incredibly impressed with what they do. We work very well together and are looking forward to continuing our collaboration with Spicer in the future,” Christian concluded.



## Exclusive UK Distributor Agreement for Vü Imaging System Announced

**Scientific Laboratory Supplies (SLS)** are pleased to announce that they have signed an agreement with Pop-Bio Imaging, based in Cambridge, to be the exclusive UK distributor for the exciting new Vü imaging system for gels and blots.

Vü is no ordinary gel documentation system however. The Pop-Bio Imaging system uses no cameras, no lenses, filters, or lasers but instead utilises a new technology to accurately map images at ultra-high sensitivity and resolution. The result is a small desk top instrument with a very small footprint that can handle the full range of gel and blot applications – UV, blue light, visible and chemiluminescence. The Advanced Progressive Imaging technology (patent pending), which was developed in Cambridge, is a clever use of imaging sensors that accurately map low levels of light from any gel or blot.

Aside from the new technology being used in the instrument the cost is also considerably lower than that of a traditional gel documentation system which uses high cost CCD cameras, lenses and filters. The new Pop-Bio Imaging system aims to become the new standard for gel and blot image capture and replace existing traditional gel documentation systems over the next few years. This device is destined to change the way images of gels and blots are captured.

Pop-Bio Imaging are very happy to be associated with SLS who have grown to become the UK's largest independent supplier of laboratory equipment, chemicals and consumables. Their unique approach to sourcing and supplying the highest quality, best value products and brands in the market make them the obvious choice to work with the Vü systems.

Paul Hutchinson, General Manager Specialist Sales (SLS), commented: "We are delighted to have the unique Pop-Bio gel doc imaging system within our, already, comprehensive life science portfolio. Given the new technology and favourable price point I am sure this will be the 'go to' system in the, not too distant, future."

Paul Ellwood, Managing Director of Pop-Bio, said: "I am very pleased for us to be working with SLS. They have a long history in imaging systems and therefore provide us with a proven track record in selling these types of products. We look forward to bringing the Vü systems to the UK market with SLS."



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## New Benchtop 3D X-ray Microscope Introduced



**Bruker** have announced the new SKYSCAN™ 1273 benchtop 3D X-ray microscope based on micro-computed tomography (Micro-CT) technology. The SKYSCAN 1273 sets a new standard for non-destructive testing (NDT) with benchtop instruments, providing a performance level previously only achieved by floor standing systems.

Samples with up to 500 mm length, 300 mm diameter, and a maximum weight of 20 kg can be investigated with powerful and precise positioning stages. The combination of a higher-energy X-ray source running at higher power (130 kV, 39 W) and a large format 6-megapixel flat-panel detector with ultimate sensitivity and speed provides excellent image quality in just a few seconds. The SKYSCAN 1273 produces 3D images of internal structures with high resolution based on a voxel size smaller than 3 µm.

The comprehensive software for straightforward data collection, advanced image analysis, and powerful visualisation makes the SKYSCAN 1273 an easy-to-use 3D X-ray microscope. Micro-CT with helical scanning for distortion-free data acquisition and artefact-free reconstruction algorithms provides images without blurring, even for planar structures in all directions.

For high-speed requirements, InstaRecon®, one of the world's fastest CT reconstruction solutions, accelerates 3D imaging up to 100 times compared to traditional algorithms.

The SKYSCAN 1273 benchtop 3D X-ray microscope requires minimum lab space, is easy to use, and virtually maintenance-free to offer high system uptime with low cost of ownership.

Dr Geert Vanhoyland, the Bruker AXS Product Line Manager for 3D X-ray Microscopy, commented: "The SKYSCAN 1273 is a turnkey solution for non-destructive 3D imaging, covering a variety of industrial and scientific applications. This includes defect detection for casting, machining, and additive manufacturing, inspection of complex electro-mechanical assemblies, pharmaceutical packaging, advanced medical tools, geological drill cores, and non-ambient microscopy."

Dr Kjell Laperre, the Bruker BioSpin Micro-CT Market Product & Applications Manager, added: "The SKYSCAN 1273 significantly extends the capabilities in preclinical imaging. Its large sample compartment combined with the higher-energy, higher-power X-ray source allows ex vivo imaging of larger and higher density samples in forensic, orthopedic, paleontological, and zoology applications."

More information online: [ilmt.co/PL/mLd6](http://ilmt.co/PL/mLd6)

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## New Analysis Tool Quickly Detects, Classifies and Identifies Microparticles

**WITec GmbH**, pioneer of Raman imaging and correlative microscopy, has introduced ParticleScout, a revolutionary particle analysis tool for the alpha300 Raman microscope series. It enables researchers to find, classify, quantify and identify particles quickly and easily.

ParticleScout delivers a greatly accelerated workflow to the researcher investigating particulate samples while making full use of confocal Raman imaging's abilities in fast, label-free and nondestructive chemical characterisation. It begins by surveying samples with bright and dark field illumination to view the particles they contain. Image Stitching combines many measured areas for a detailed overview of large areas and Focus Stacking allows larger particles to be sharply rendered for accurate outline recognition. The optical images lead to the creation of a mask which is used to physically categorise particles of interest and arrange them in a ranked list. A Raman spectrum is then automatically acquired from each particle.

The Raman spectra are evaluated and the particles they correspond to can be identified manually or by using the seamlessly-integrated WITec TrueMatch Raman database software. This integration of a particle analysis tool with a Raman database is unique in the industry and offers a streamlined experimental environment to boost productivity.

Finally, ParticleScout generates a comprehensive report that features user-selectable combinations of filters and advanced algorithms to show the quantities of selected particles and their prevalence relative to other groups. These reports make ParticleScout the perfect tool for finding correlations between the physical and chemical attributes of particles.

From large-area imaging to high-resolution spectroscopy, the technology underlying ParticleScout provides thorough and detailed insight to the researcher in microplastics research, environmental science, pharmaceutical research, geology, food science and many other fields.

"ParticleScout expands our product range into an area that is currently experiencing an enormous boom due to the public debate on microplastics in the environment. Raman spectroscopy is an extremely powerful tool for the rapid identification of these sorts of harmful particles," explained Dr Joachim Koenen, WITec Co-founder and Managing Director. "In addition, ParticleScout provides an unprecedented level of speed and ease of use in particle analysis with Raman microscopy. With ParticleScout, a time-consuming sequence of individual steps has been transformed into a flowing, continuous and fast process," Koenen continued.

More information online: [ilmt.co/PL/ALrQ](http://ilmt.co/PL/ALrQ)

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