

RAMAN MICROSCOPY FOR ART

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Raman microscopy is of a great importance for Art and Archaeological applications, as it provides a non-destructive way of analyzing artefacts to determine their origin, their authenticity or even for dating purposes. The high selectivity of this technique allows to identify the chemical nature of the sample, making it possible to distinguish between different kinds of gemstones, fibers or pigments, whether organic or inorganic, or other various components constituting a piece of art.

One of the key aspects of this technique is the ability to couple it to a confocal microscope equipped with a confocal aperture. With sub-micron resolution, a true confocal microscope enables chemical imaging when using an XY motorized stage or depth profiling when moving the sample in the Z direction, to look at multilayered paintings for instance. Moreover, fiber-coupled Raman probes can be used to analyze large artefacts, such as statues or large paintings, and portable solutions exist for on-site analysis.

The latest developments in Raman instrumentation will be presented: A new Raman microscope will be introduced that combines high mobility, multi-laser excitation and ease-of-use. Its rugged design can withstand harsh environmental conditions for analysis in the field, and it is also equipped with a fiber port for probe measurements.

We will also present a new imaging mode using scanning mirrors to perform so-called "macro-mapping" on large sample areas. This technique is also well suited for mapping small heterogeneities in rather large objects that cannot be moved easily with a motorized stage, such as statues, building materials, pottery, etc.