HORIBA
Scientific

XploRA PLUS™
Getting There Easier!

Chemical Analysis
& Imaging
for Daily Use

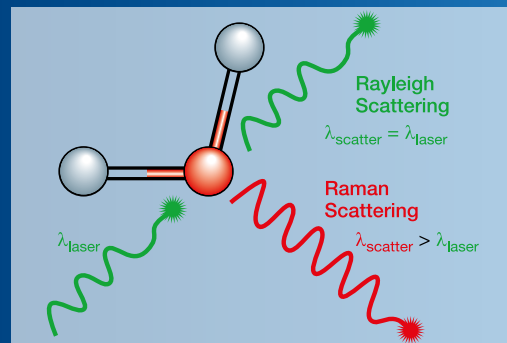**www.horiba.com/**

JOBIN YVON
Technology

XploRA Plus™: Get the Raman microscope power

Optimized compact design including advanced automation to perform full accurate analysis with a maximum ease of use and efficiency

What is Raman Spectroscopy ?

Raman spectroscopy is a vibrational spectroscopy, providing information about the molecular structure of the probed sample. The Raman phenomenon results in the inelastic scattering of a monochromatic light (typically a laser) interacting with molecules under the spot.

Rayleigh Scattering
$\lambda_{scatter} = \lambda_{laser}$

Raman Scattering

λ_{laser}

$\lambda_{scatter} > \lambda_{laser}$

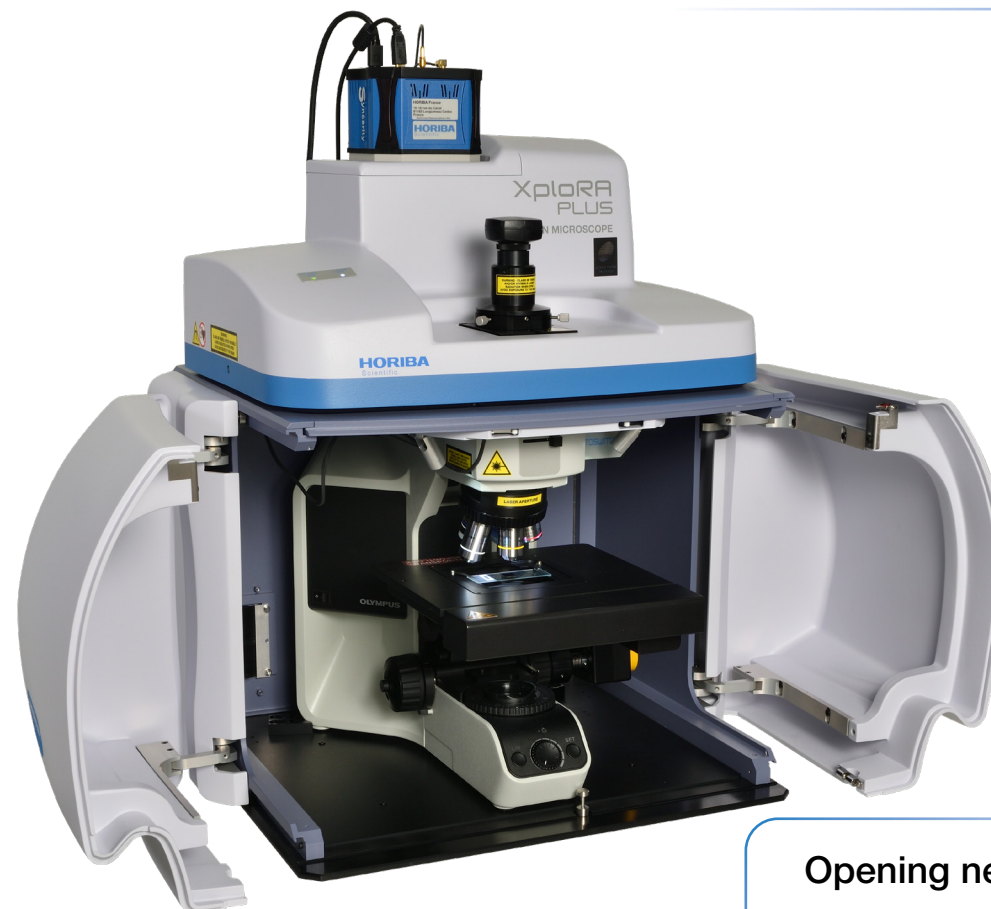A Raman spectrum gives a lot of different kind of information about the probed molecules :

- Chemical structure
- Crystallinity / Amorphosity
- Stress / Strain
- Orientation
- Presence of defects/ outliers/ contamination
- Relative concentration between compounds

Based on pure optical interaction, Raman microscopy has a lot of advantages as it is a non-destructive method, it works without contact, and all kinds of samples can be analyzed as only reduced sample preparation could be necessary, and even organic or inorganic samples can be analyzed in water/ aqueous phase.

All you need in a compact confocal design

Including up to **3 internal lasers** combined with 12 density filters levels and **4 gratings** to cover all the **UV-Vis range** with maximum **resolution**, XploRA Plus is capable to performv both **Raman** and **Photoluminescence** (PL) analysis on the whole spectral range.

Not to be limited to only one microscopy mode, its **true confocal microscope** allows **transmission or reflection** illumination to perform high quality 2D and 3D imaging. **Various microscopy modes** are also available like DIC, epifluorescence, dark field and polarized light microscopy.

Intuitive software for one-click analysis: A wealth of apps in LabStore

Combine with **LabSpec 6's** software intuitive interface, XploRA PLUS lets you use the full power of the system to obtain the best possible result. The large dedicated application range in the LabSpec6 app store makes it possible to configure the software to suit and evolve with your specific needs.

Automation for fast and easy measurements

No need to be a Raman expert to use XploRA PLUS at the maximum capabilities. **Automated lasers** switch function, **internal Autocal** function and advanced calibration tools **VRM** and **OA** are included in standard version, and allow you to stay focused on your sample, without need of manual intervention to adjust settings parameters and obtain perfect calibration.

Patented **SWIFT™** functions allow fast Raman imaging. Combine with an **EMCCD** detector (optional) to get a perfect Raman image **up to 10 times faster** than a classical point-by-point measurement.

Opening new horizons

The XploRA PLUS can be coupled with HORIBA AFM to achieve **NanoRaman** (TERS) probing nanometer structures and single molecules in a single compact, high performance system with down to a 10 nm resolution.

XploRA PLUS™ can also integrate the patented **nanoGPS navYX** function to achieve a full collaborative characterization with various other microscopy modalities like SEM, FTIR, and others. Forget accuracy trouble; this exclusive feature offers high relocalization accuracy at the micron level.

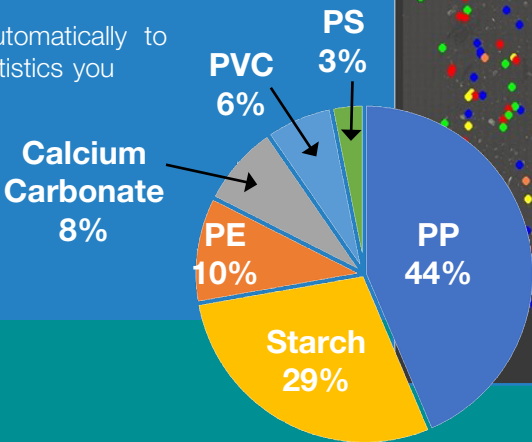# Solve all analytical challenges, XploRA Plus™ designed for all your needs

More than instrument, XploRA PLUS is your daily partner to solve every analytical challenge in every application field

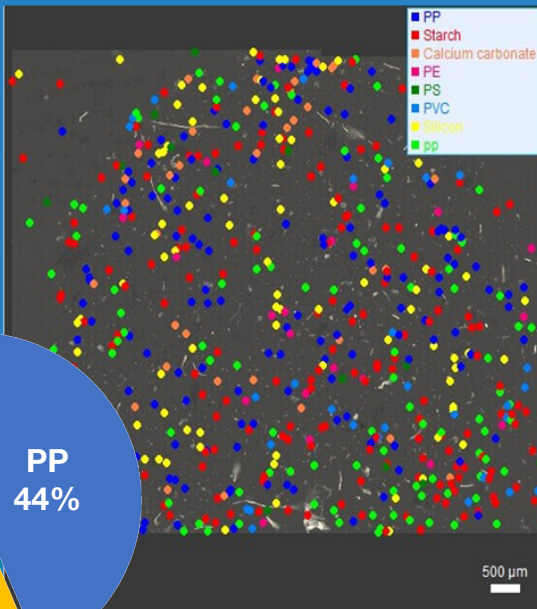## Microplastics identification & quantification

Microplastics identification and quantification represent a major issue for public health, and a true challenge for analytical laboratories. In fact, their analysis requires simultaneous morphological and chemical information.

XploRA PLUS combines a fully automated laser selection and **ParticleFinder™** in order to allow to access to a full characterization of microplastics particles, even the smaller ones around 1 μm diameter.
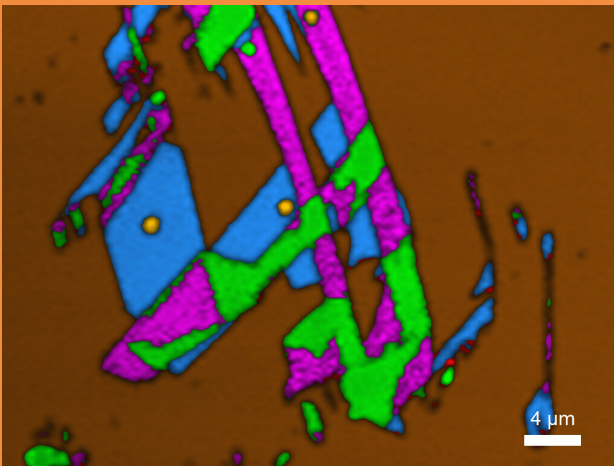
Reports can also be generated automatically to include all the parameter and the statistics you need.

Microplastics from water analysis locked on a filters analysis – All of them are detected, identified and sorted

500 μm

Legend: PP, Starch, Calcium carbonate, PE, PS, PVC, Silicon, pp

Pie chart:
- PP 44%
- Starch 29%
- PE 10%
- Calcium Carbonate 8%
- PVC 6%
- PS 3%

Graphene and carbon-based materials

Example of graphene multilayer analysis – Brown : Silicon; Orange: Amorphous carbon; Blue: Monolayer graphene; Purple: Bilayer graphene; Green: Trilayer graphene; Red: Defects

4 μm

Graphene is a fundamental material which may partially replace silicon in microcircuits and computer chips in the future. Moreover, it also is on of the base of the electrodes in batteries or fuel cells. As its properties are directly related to its structure, understanding layer micro or nano organization is the key for developers and producers.

With its high spatial resolution around 0.5 μm conjugate with its SWIFT™XS function, XploRA PLUS is able to provide fast Raman characterization of graphene layer (less than 1 ms/point).
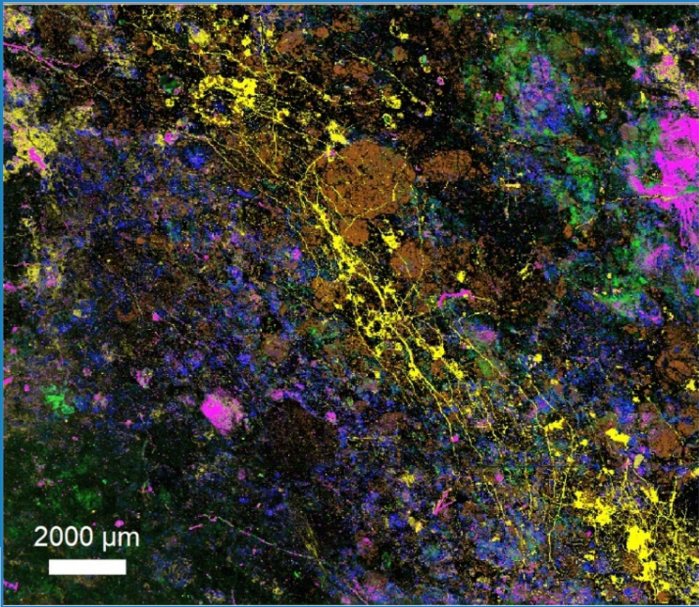
Gem investigation and mineral phases

As all luxury products, gems are victims to counterfeit and low-quality markets. Characterizing the gem quality becomes so critical to ensure their quality. As a non-destructive technique without sample preparation need, Raman microscopy is the ideal ally for this.

Moreover, the XploRA PLUS ease-of-use combines with its best compromise between spectral resolution and sensitivity makes this system perfect for gem and mineral phases investigation, in any kind of geological sample.

The confocality of the system also enables characterization of the presence of inclusions based on a fast-imaging strategy using SWIFT™.
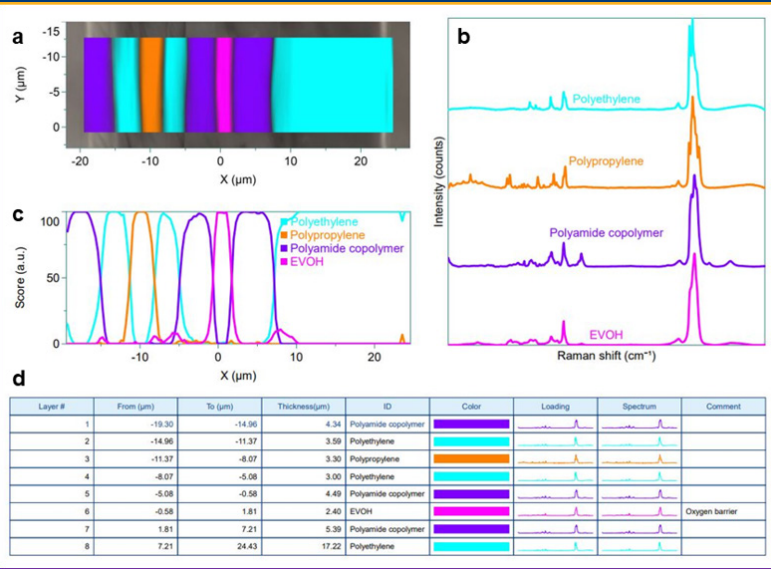
Meteorite chemical map highlighting the different mineral phases.

2000 μm

Polymers multilayers cross-section analysis

Polymer-based multilayers are fundamental in many applications like food or pharmaceutical packaging.

With its Multilayers dedicated application, XploRA PLUS is the perfect tool to fully characterize even the more complicated material. Even μm scale layers can be clearly identified and their thickness measured with high accuracy.

Multilayers cross section analysis results – all layers are identified as their thickness

LabSpec 6 Spectroscopy Suite: Raman imaging has never been so easy

Use XploRA PLUS full power with LabSpec 6 software: Solve all your analytical challenges and obtain the best possible results without needing to be an expert

One Click

Raman acquisition optimizes acquisition parameters and signal processing in OneClick including baseline corrections, fluorescence rejection and noise reduction.

Easy navigation package for advanced multimodal imaging

NavMap™ is an innovative video feature that shows the global sample and the zoomed region of interest within the sample, simultaneously, in real-time.

NavSharp™ technology delivers sharp and real-time navigation on a sample image with any topography. The surface focus is readjusted automatically with the use of an automated Z sample stage.
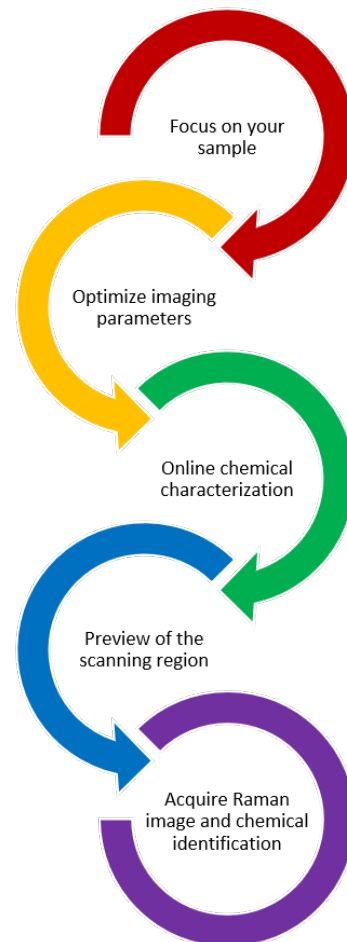
ViewSharp™ focus stacking constructs an image in which all surfaces are in focus simultaneously, and creates a 3D topography image. It guarantees the highest focal quality in hyperspectral images, by using the recorded topography which corresponds to the best focus of any pixel of the image.

EasyImage™
Perform perfect Raman image in one step

EasyImage™ is HORIBA's new imaging wizard for Raman microscopy. Allows quick and easy acquisition of meaningful chemical images of your samples without needing a high level of Raman expertise. Just select your targeted area and then, EasyImage does the job! It automatically optimizes measurements parameters, performs the chemical identification and edits the report.
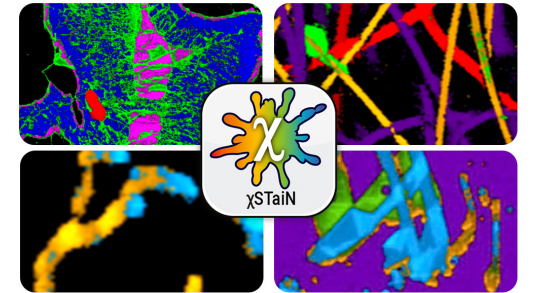
No need to be an expert to obtain perfect image.

- Focus on your sample
- Optimize imaging parameters
- Online chemical characterization
- Preview of the scanning region
- Acquire Raman image and chemical identification

χSTaiN™: Instant Raman Analysis

χSTaiN™ is HORIBA's innovative and intelligent tool for fully automated processing and analysis of Raman 2D images. It builds on HORIBA's multidecade expertise in the analysis of spectral images through our global network of partners.
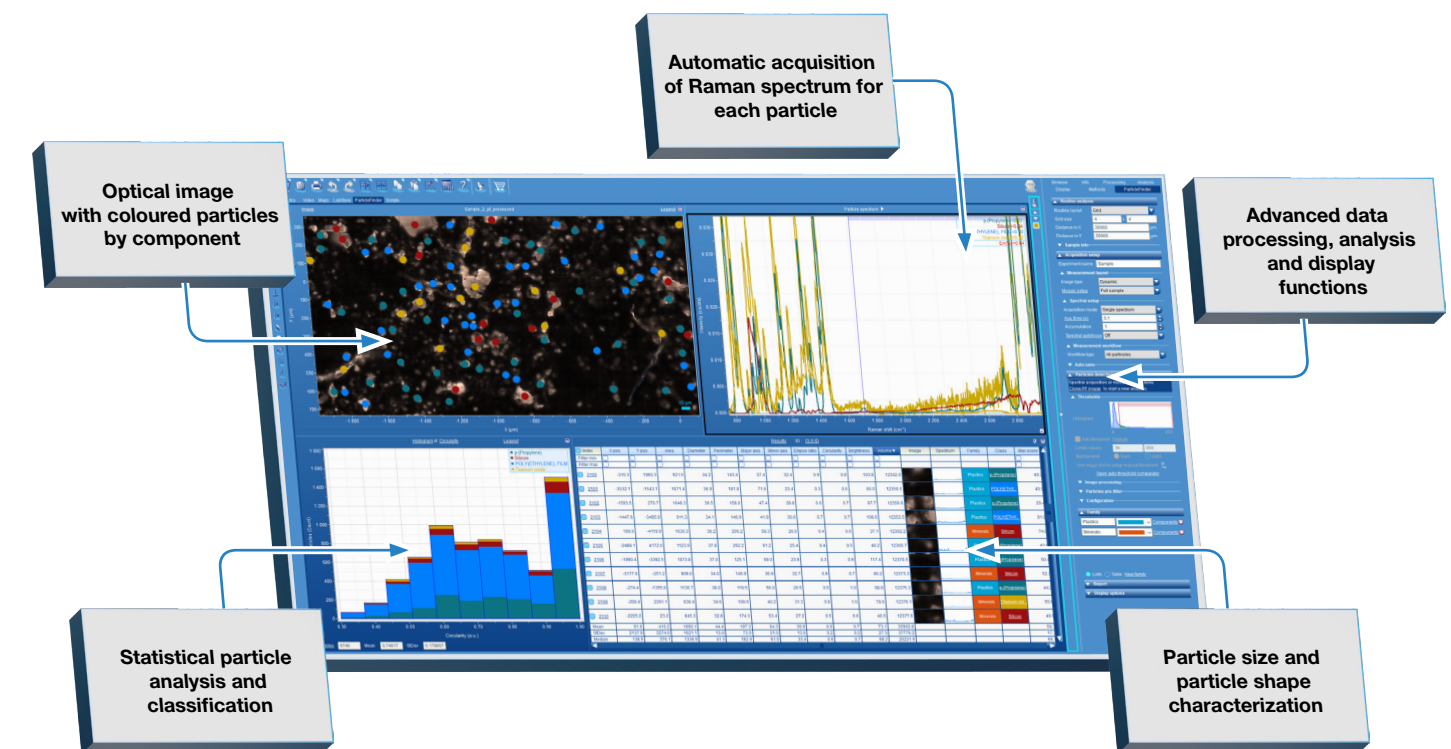
You are just one click away from obtaining the most relevant Raman image! Fast and easy-to-use application, χSTaiN processes the hyperspectral data and classifies compounds within a sample using intelligent chemometrics tools.

ParticleFinder™ for particle analysis

ParticleFinder performs a comprehensive classification of particles in seconds, combining morphological and chemical analysis.

Typical applications are rapid quality control of microplastics or pharmaceutical substances.

- Automatic acquisition of Raman spectrum for each particle
- Optical image with coloured particles by component
- Advanced data processing, analysis and display functions
- Statistical particle analysis and classification
- Particle size and particle shape characterization

ProtectionPlus™: User profile management and maximum data traceability

- User profiles can be configured and are password-protected
- *AuditTrail* guarantees data traceability at each step in the process
- *ProtectionPlus* assures compliance with FDA 21
- CFR Part 11 and GMP/GLP requirements

Worldwide Training and Technical Support

Jobin Yvon, established in 1819, and now part of the HORIBA Scientific is one of the world's largest manufacturers of analytical and spectroscopic systems and components.

The HORIBA Scientific teams are committed to serving our customers with high performance products and superior technical support.

Our staff of experienced application and service engineers, located around the world, provides full support for your instrument and its future upgrades.

Well-equipped application laboratories allow for sample analysis and hands-on training for new and experienced users.

HORIBA Worldwide

www.ramanacademy.com

Free learning tools for new and experienced Raman users.
Available to anyone who is interested in learning more about Raman.

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