

LabRAM Odyssey

Advancing knowledge further

**Ultra Flexibility and
High Performance
for Advanced Applications**



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LabRAM™ Odyssey: Get full Raman microscope power

LabRAM Odyssey perfectly combines high flexibility, automation and maximum performances to address the most advanced analytical challenges

High spectral and spatial resolution

The LabRAM Odyssey high throughput 800 mm single stage optimized spectrometer combines high sensitivity with high spectral and spatial resolution.

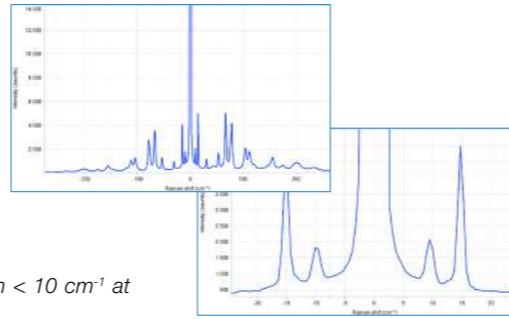


High quality and optimized design is essential to provide accurate results to study all kinds of samples.

Don't miss any information on the sample

With state-of-the-art notch and bandpass filters, access frequencies down to 5 cm⁻¹* on the LabRAM Odyssey and obtain ultra-low frequency spectral data.

**Depending on excitation wavelength, specification < 10 cm⁻¹ at 532 nm, 633 nm and 785 nm*



Advanced, yet easy to use intuitive software and automation

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

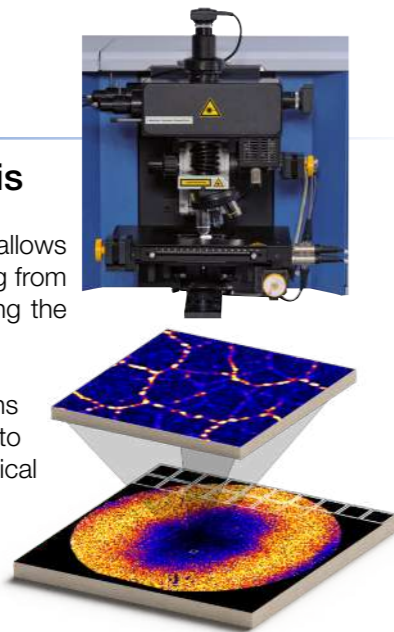


LabRAM Odyssey offers high level of automation like a laser switch, an automated objective turret or an automated spatial calibration with its VRM patented function.

Fast confocal analysis

DuoScan™ imaging technology allows high precision and fast mapping from deep UV to NIR, without moving the sample.

Patented SWIFT™ functions allow fast Raman imaging up to 10 times faster than a classical point-by-point measurement.



Ultra flexible platform

The design of the LabRAM Odyssey open space microscope makes it a true scalable system able to integrate various additional modules like large cryostats, broad travel range stages, etc.

The inverted microscope option allows you to illuminate the sample from below and gives you more free space on the top of the sample.

LabRAM Odyssey can also perform remote measurements with the SuperHead fiber optic probe.



From deep UV to NIR without compromise

The LabRAM Odyssey achieves a fully achromatic spectrometer spectral range from 200 nm to 2200 nm.

The availability of excitation lasers from deep UV to near IR measures both photoluminescence and Raman signals in the same spectrum.

Push the frontiers from microRaman to NanoRaman™

The LabRAM Odyssey can be coupled with the HORIBA AFM to achieve NanoRaman (TERS) high performance down to a 10 nm resolution.

The LabRAM Odyssey can also integrate our patented nanoGPS™ navYX function to achieve a full collaborative characterization with various other microscopy modalities like SEM, FTIR, and others.



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

Maximize the full power of the LabRAM Odyssey with LabSpec 6 software: Solve all your analytical challenges and obtain the best possible results.



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.

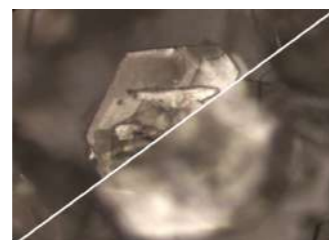


ViewSharp™* focus stacking constructs an image in which all surfaces are in focus simultaneously, and creates a 3D topography image. It guarantees the highest focal quality in hyperspectral images, by using the recorded topography which corresponds to the best focus of any pixel of the image.

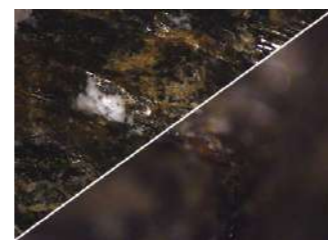
* Patented feature



NavMap™ View



With/Without NavSharp™



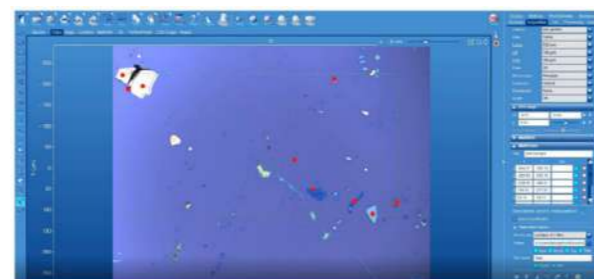
With/Without ViewSharp™



MultiPoints: Automatic Acquisition of Raman Spectra at Multiple Positions

The MultiPoints© App allows you to create your own recipe by selecting various points, at any location on a sample. Each position can be set in X, Y and Z dimensions and saved.

A load and launch of an acquisition list can be started after positioning your sample!



MVAPlus: Multivariate Raman analysis at your fingertips

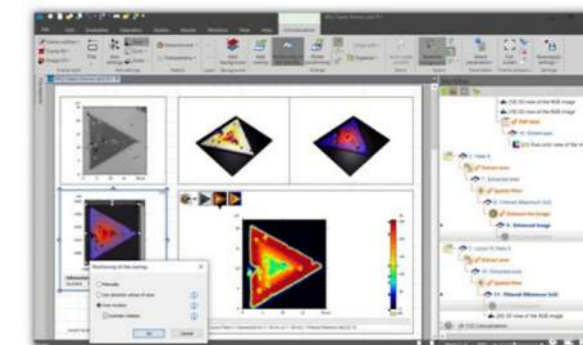
With MVAPlus, complex Raman chemical images can be processed and characterized rapidly and easily. MVAPlus has been tested and validated on a variety of datasets from small to large and with various Signal-Noise Ratios.

The intuitive interface requires minimal knowledge of multivariate techniques. Commonly used pre-processing functions for the included methods are available as part of MVAPlus and it is also possible to customize the analyses parameters.



GraphXY: Correlate multiple modalities with ease

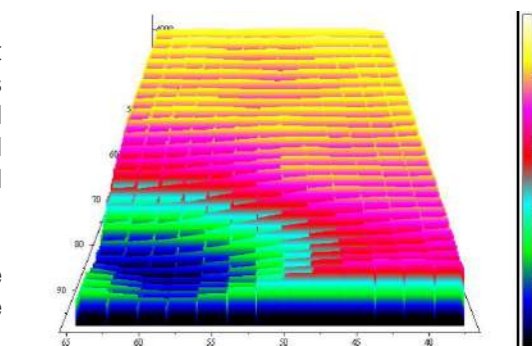
graphYX™ is a software app which enhances display and superimposes the position of several layers composing your image into a traceable workflow. It also includes sharing tools to streamline collaborative work and publishing functionalities to save your time generating papers and reports. Combine graphYX™ with nanoGPS™ navYX™ to quickly relocate your sample's points of interest, overlap map data and obtain the ultimate tool for correlated microscopy.



Si Stress: Automated silicon stress analysis

Raman Spectroscopy is particularly effective at establishing the characteristics of photovoltaic cells and microelectronic devices. Mechanical stress and strain can be detected by analyzing the spectral shift of the band position, thus allowing tensile and compressive stress to be quantified.

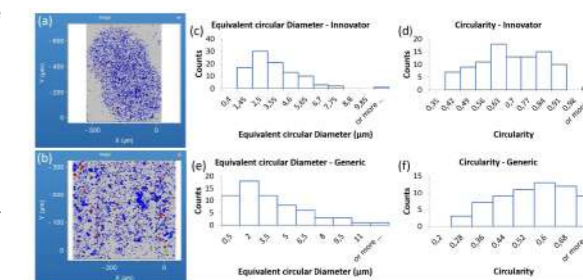
The Si Stress App joins the LabSpec 6 Software Suite for automated stress analysis of microcrystalline silicon with optimized analysis reports



ParticleFinder™: Measure, identify, and classify particles

ParticleFinder offers a user-friendly tool for automated location, characterization and Raman analysis of particles. Hundreds to thousands of particles can be quickly located on a video image, analyzed for size and shape descriptors, and then chemically characterized using Raman spectroscopy.

ParticleFinder is compatible with any HORIBA Raman spectrometer equipped with LabSpec 6 software, a video camera and motorized XY sample stage. With these requirements met, ParticleFinder's Raman analysis can fully exploit the unique capabilities of the LabRAM Odyssey to ensure the most appropriate chemical interrogation. This can range from routine identification of common particles and contaminants, to advanced characterization of polymorphism/phase, photoluminescence and stress/strain.



API distributions. (a) Spatial distribution of API (red) and excipient (blue) in the innovator spray area. (b) Spatial distribution of API (red) and excipient (blue) in the generic spray area. (c-f) Equivalent circular diameter and circularity distributions of API only in the innovator and generic sprays.

Discover all LabSpec6 Apps and features on our website

Solve the most advanced applications challenges with LabRAM™ Odyssey

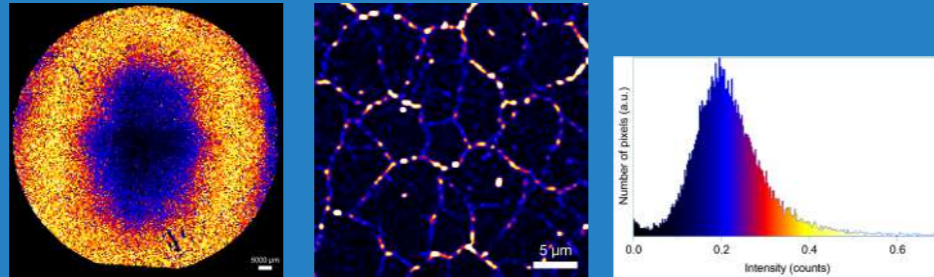
High flexibility and maximum performance ensure the best results

Semiconductors

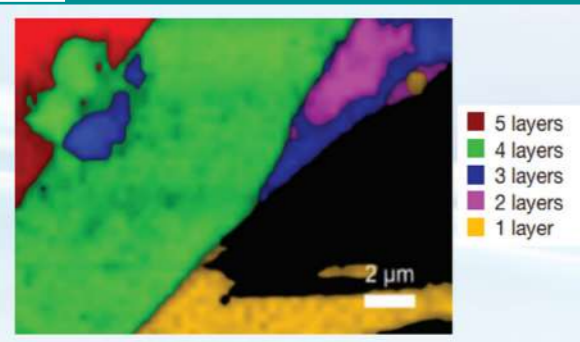
Stress/strain measurements, alloy composition, ultra-thin cap layer characterization, imaging of etched chip structures, band gap analysis.

Raman and photoluminescence (PL) studies of semiconductor materials enable specialists to collect crucial information about the composition and behavior of their components

Raman/PL characterization of Graphene and 2D semiconductors



Advanced and 2D Materials



Graphene and 2D materials, polymers and monomers, inorganics and metal oxides, ceramics, coatings and thin films, photovoltaics, catalysts: The LabRAM Odyssey contributes to a better knowledge of materials and is a reliable tool for routine analysis

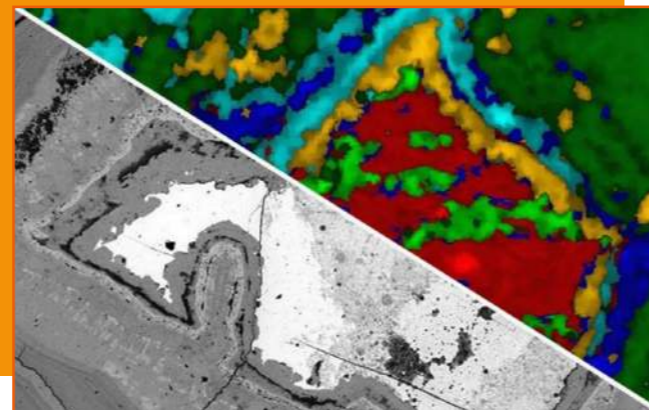
Raman image of MoS₂ flake with different number of layers distinguished based on MoS₂ band shift

Open new horizons with correlative imaging

Most complex samples like microplastics, geological or advanced materials samples cannot be fully characterized only by one analytical technique.

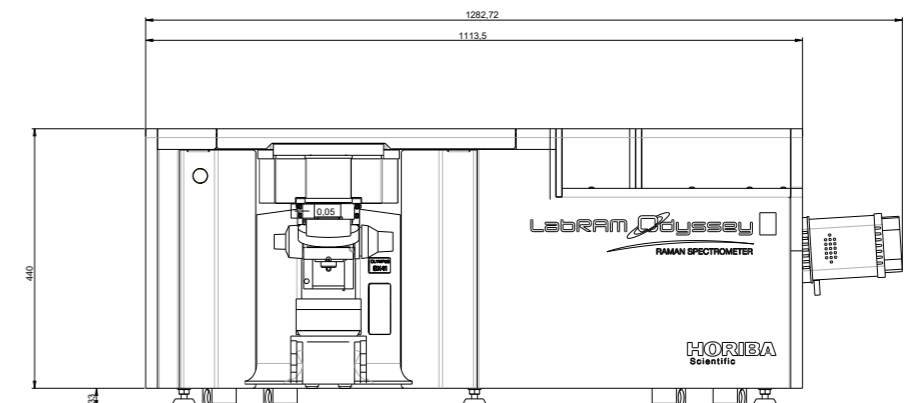
The NanoGPS Suite™ based on machine-pattern reading, permits the user to precisely relocalize the specific areas in the sample through a wide variety of optical and electron microscope instruments, rapidly and easily.

Distribution of the mineral phase for pyrite spatial characterization – Collaborative & correlative microscopy: SEM, SXES, EDS and Raman microscopy



LabRAM™ Odyssey: key specifications

| General Specifications | | |
|---|--|--|
| Wavelength range | Deep UV to VIS-NIR | Standard 200 nm - 2200 nm (achromatic, no change of optics required) |
| Imaging spectrometer | Czerny-Turner configuration | Focal length: 800 mm |
| Lasers | Up to 6 motorized | User selectable: 266 nm, 325 nm, 355 nm, 405 nm, 458 nm, 473 nm, 532 nm, 633 nm, 660 nm, 785 nm, 1064 nm Other wavelengths possible on request. |
| Laser filters | Unlimited | Various range of filters (Dielectric, Notch, ULF...) to cover all the applications. |
| Number of gratings | Unlimited | |
| Spectral resolution FWHM | @ 244 nm excitation wavelength $\leq 1.5 \text{ cm}^{-1}$ with 3600 gr/mm @ 532 nm excitation wavelength $\leq 0.6 \text{ cm}^{-1}$ with 1800 gr/mm and $\leq 0.3 \text{ cm}^{-1}$ with 3000 gr/mm @ 633 nm excitation wavelength $\leq 0.4 \text{ cm}^{-1}$ with 1800 gr/mm and $\leq 0.2 \text{ cm}^{-1}$ with 2400 gr/mm @ 785 nm excitation wavelength $\leq 0.2 \text{ cm}^{-1}$ with 1800 gr/mm | |
| Ultra Low Frequency (ULF) | < 10 cm^{-1} measured on sulfur | Based on Volume Bragg Filters (VBG). Available for 473, 532, 633 and 785 nm laser excitations. |
| Automated internal calibration functions | Built-in automatic AutoCAL & ICS methods, VRM & VRM OA as standard | Automated calibration of spectral intensity and range calibration. VRM ensures high spatial accuracy for Raman and microscopy mapping, VRM OA allows change of magnification without loss of spatial accuracy. |
| Fast Raman imaging | Patented SWIFT™ functions | Compatible with all objectives and all lasers. 3 available in standard: SWIFT™ imaging, repetitive imaging and XR high spectral resolution. SWIFT™ XS high speed imaging requires an optional EMCCD detector to be used. |
| AFM / SEM coupling | Yes | Compatible with NanoRaman module and with patented nanoGPS navYX™ for correlative microscopy measurements. |
| Dimensions W x H x D (mm) | 1300 x 1194 x 473 | The depth depends on the XY stage and the laser bench (optional). This value is for the 100 x 100 mm stage and with the laser bench-Class IIIb system - without optional CDRH. |
| Weight | ~100 kg | Depends on configuration. |
| Safety | Class IIIb | Optional CDRH Laser safety class 1 |



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