

# MonoVista CRS+

## Confocal Raman Microscopes



### MonoVista CSR+

#### Confocal Raman Microscopes System Features

- Advanced modular design with all versatile Raman technologies organically integrated in a single station
- All things automated from laser/optics selections, alignment/calibration, XYZ scanning to data mapping
- Lasers:
  - Deep UV and NIR wavelength range
  - up to 4 integrated multi-line lasers plus port for large external lasers
  - Dual beam path for UV and VIS/NIR lasers
- Spectrograph:
  - 500 mm or 750 mm focal length spectrograph
  - High spectral resolution, i.e., FWHM <math>< 0.2 \text{ cm}^{-1}</math> @ 633 nm
  - High frequency range up to 9000  $\text{cm}^{-1}$  (@532 nm), useful for photoluminescence for additional benefit
  - Low frequency range down to +/- 10  $\text{cm}^{-1}$  with ultra-narrow band notch filters
- Spectroscopy Detectors
  - Wide range of spectroscopy detection selection: Peltier and liquid nitrogen cooled detectors
  - CCD detectors; InGaAs array detectors; EMCCs; PMTs
- Microscopes:
  - Confocal microscopes with sub-micron spatial resolution
  - Upright or inverted, or dual upright/inverted microscopes
  - Wide choice of UV, VIS, and NIR objectives
  - Built-in polarizers with automated selection
- Sample Stages:
  - Stepper motor XYZ stages with resolution less than 50 nm
  - Piezo XYZ stages with resolution less than 1 nm
  - Heating/cooling stages and Helium temperature cryostats
- Plus option:
  - Combined AFM
- Software:
  - Automated hardware control at finger-tip for easy operation
  - Stokes Raman/Anti-Stokes Raman/Polarized Raman spectrum collection
  - Step-by-step and fast Raman mapping choices
  - Data preprocessing routines and spectral library module
  - AFM control

**W2 Innovations, Inc.**

364 Brighton Street, Belmont, MA 02478 USA Tel: (+1) 617.216.3606 [info@w2innovations.com](mailto:info@w2innovations.com)

[www.w2innovations.com](http://www.w2innovations.com)

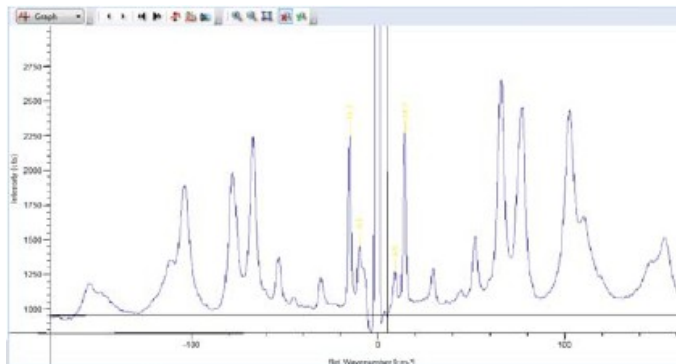
# MonoVista CSR+

## Confocal Raman Microscopes

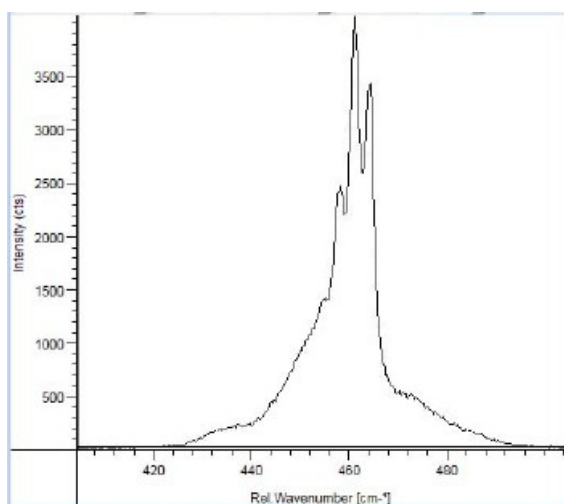
### Lasers and Filters

- Choices of deep UV to NIR lasers
- Up to 4 integrated multi-line lasers
- Additional port for external lasers
- Separated beam path for UV and VIS/NIR lasers
- Motorized laser selection
- Auto alignment and calibration
- Edge filters from UV to NIR
- Ultra-narrow band notch filters for 488, 514, 532, 633, 785, and 1064 nm lasers

### Stokes/Anti-Stokes spectrum from L-Cystine, Taken with Ultra Narrow Band Notch Filters



### Exceptional Resolution shown CCL<sub>4</sub> Spectrum



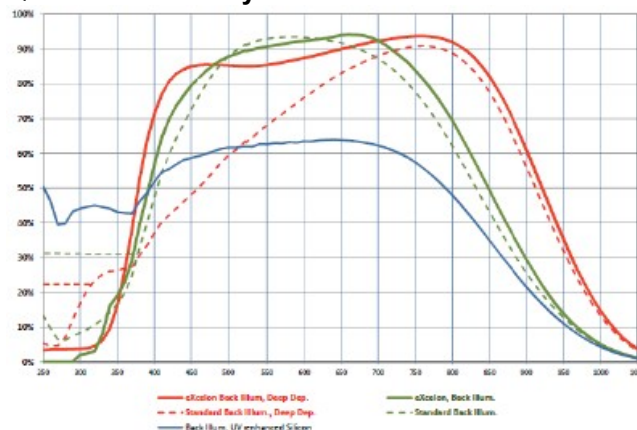
### Imaging corrected Spectrographs

- Long 500 or 750 nm focal length for high resolution
- Image corrected optics with superior imaging quality for high resolution and multi-track applications
- Dual entrance and dual exit ports
- Interchangeable 3 Grating Turrets with 3 gratings
- Motorized slits with 0 - 3 mm width
- Optional silver or gold coated mirrors
- Choice of more than 100 gratings available for the optimal spectral range, throughput, and dispersion
- Stepping motor scanning system with microprocessor control providing superior precision and repeatability of wavelength positioning

### Spectroscopy Detectors

- Deep Peltier cooled detectors (down to -75 °C)
- Liquid nitrogen cooled detectors
- InGaAs array detectors
- EMCCDs for fastest Raman mapping
- Back illuminated eXcelon CCD detectors with lowest etaloning
- Photon Counting PMT systems

### Quantum Efficiency Curves of Different CCD Detectors



**W2 Innovations, Inc.**

364 Brighton Street, Belmont, MA 02478 USA Tel: (+1) 617.216.3606 info@w2innovations.com

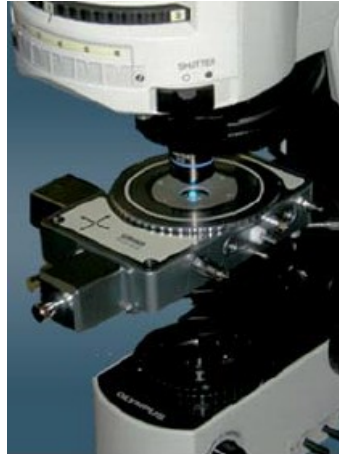
[www.w2innovations.com](http://www.w2innovations.com)

# MonoVista CSR+

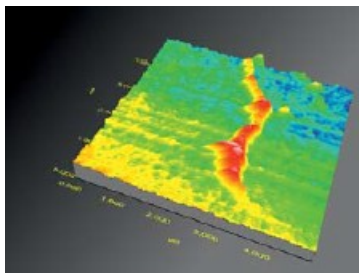
## Confocal Raman Microscopes

### Microscope Features

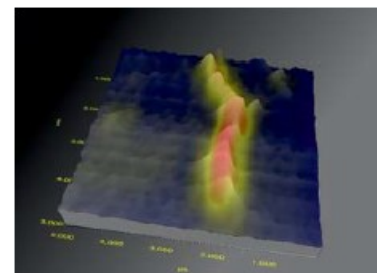
- Upright Olympus microscopes BX51WI
- Inverted Olympus microscopes IX71
- Dual (both upright and inverted) microscope
- Wide range of UV, VIS, and NIR objectives
- Long working distance objectives
- Motorized XYZ stages with resolution <50 nm
- Piezo XYZ stages with resolution <1 nm
- Heating stages up to 1500 °C
- Heating/cooling stages from -196 to 600 °C
- Helium temperature cryostats
- Combined Raman and AFM with Nanoics and JPK Instruments AFM systems
- Laser safety Class I option



Microscope Image



AFM Image of Carbon Nanotube

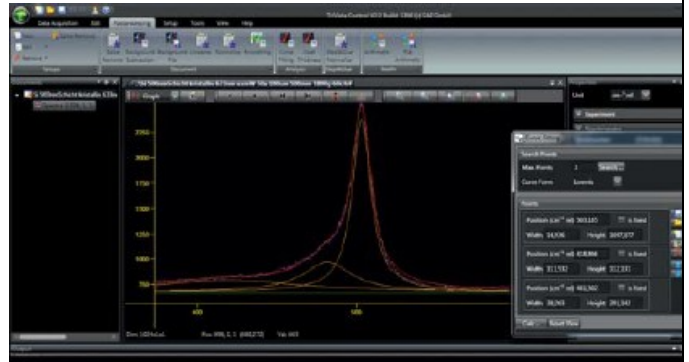


AFM plus Raman Image

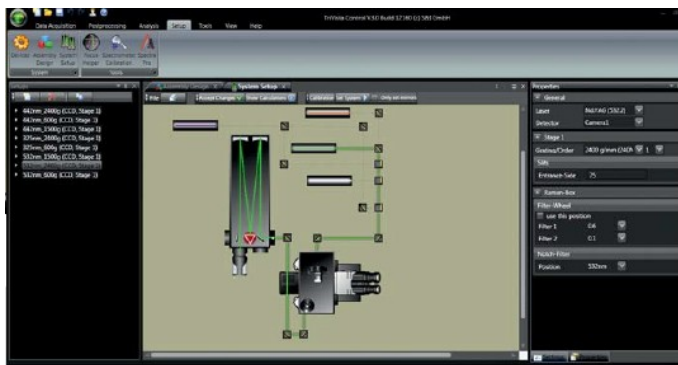
### Software Features

- Spectrograph setup
- Auto alignment for laser input and Raman signal
- Wavelength and intensity calibration
- Temperature control for heating, cooling stages and cryostats
- Raman mapping with auto focus
- Step-by-step and fast Raman mapping
- Various post-processing routines
- Fluorescence and background subtraction
- Spectral library module
- Choices of data import and export formats

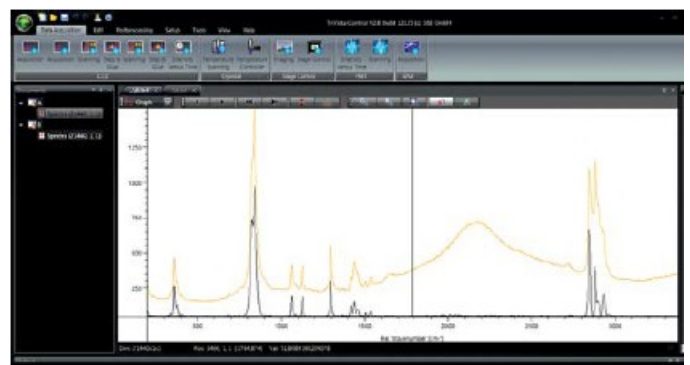
### Curve Fit and Deconvolution



### Hardware Setups and Laser Selection



### Fluorescence and Background Subtraction



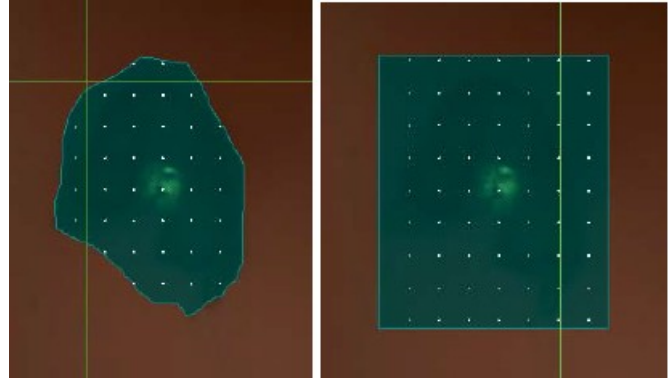
# MonoVista CSR+

## Confocal Raman Microscopes

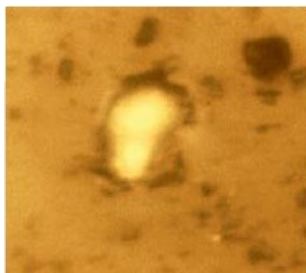
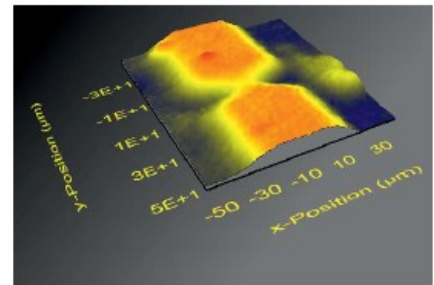
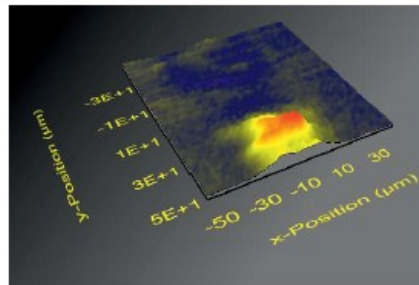
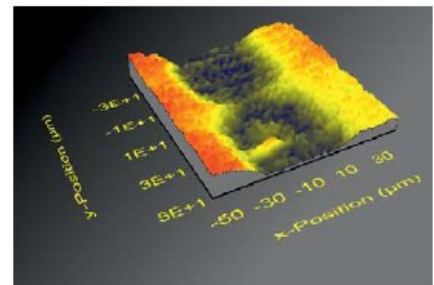
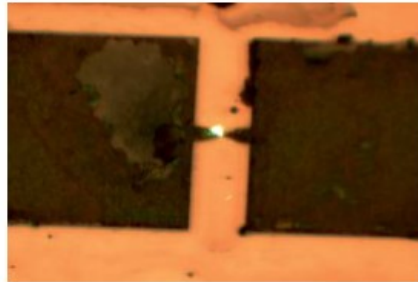
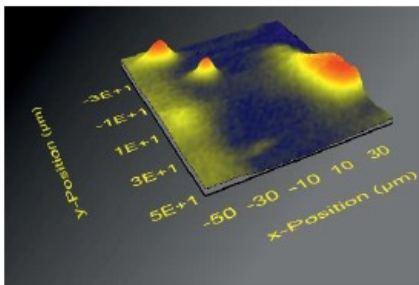
### Sample Mapping Features

- Line mapping in X, Y and Z dimensions
- XY mapping with autofocus
- XYZ mapping
- Point-by-point mapping
- Fast mapping
- Fast mapping with line focus
- Rectangular and free-hand mapping area selections
- Enhanced mapping analysis and display routines

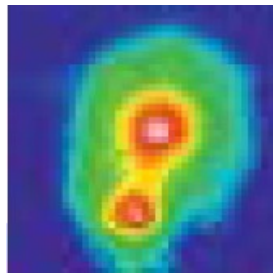
### Mapping area selection



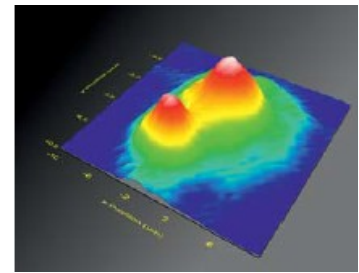
### 3D Raman images from different components on one sample



Microscope Image



2D Raman Image from an Enclosure



3D Raman Image

**W2 Innovations, Inc.**

364 Brighton Street, Belmont, MA 02478 USA Tel: (+1) 617.216.3606 info@w2innovations.com

[www.w2innovations.com](http://www.w2innovations.com)

**W2 Innovations (W2I) represents Spectroscopy & Imaging (S&I) GmbH in Germany for its Super High Resolution Confocal Raman Systems in North America and Asia.**