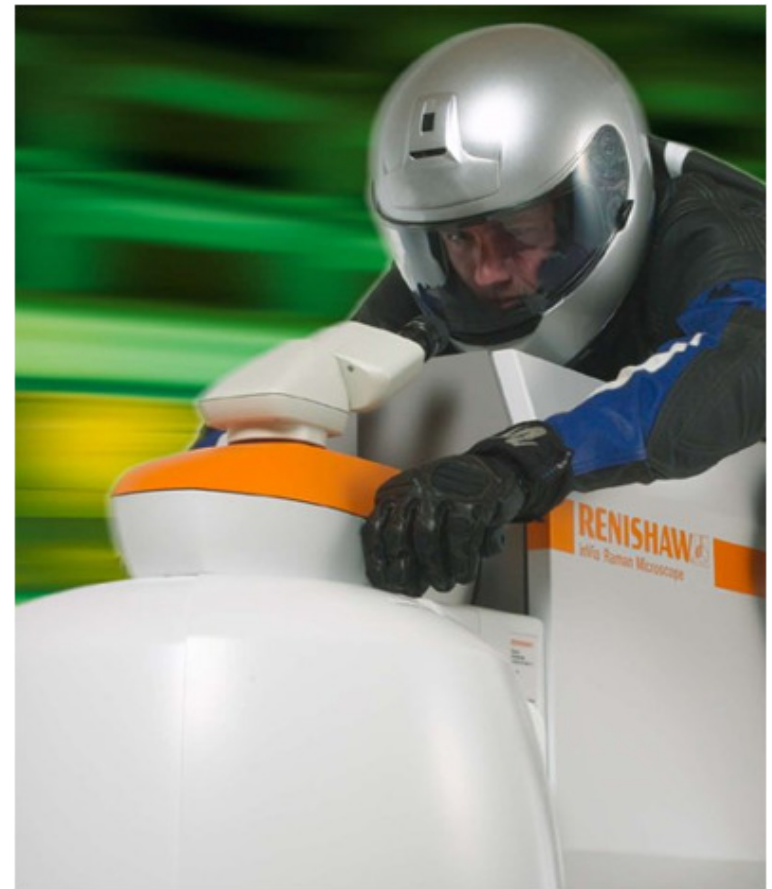
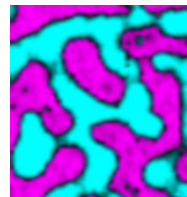
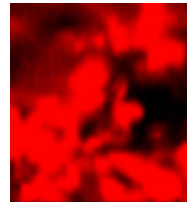
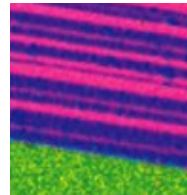
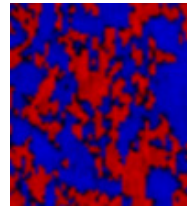


StreamLine™ - fast chemical & structural imaging

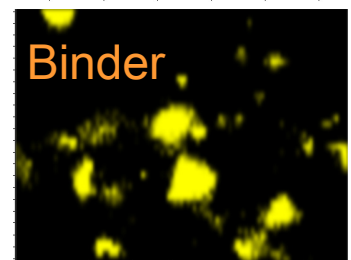
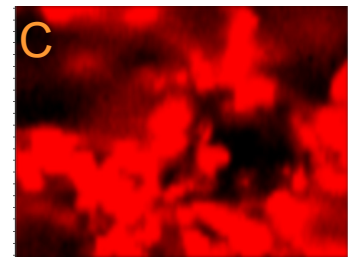
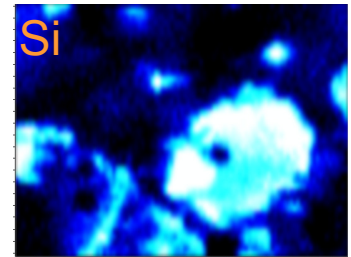
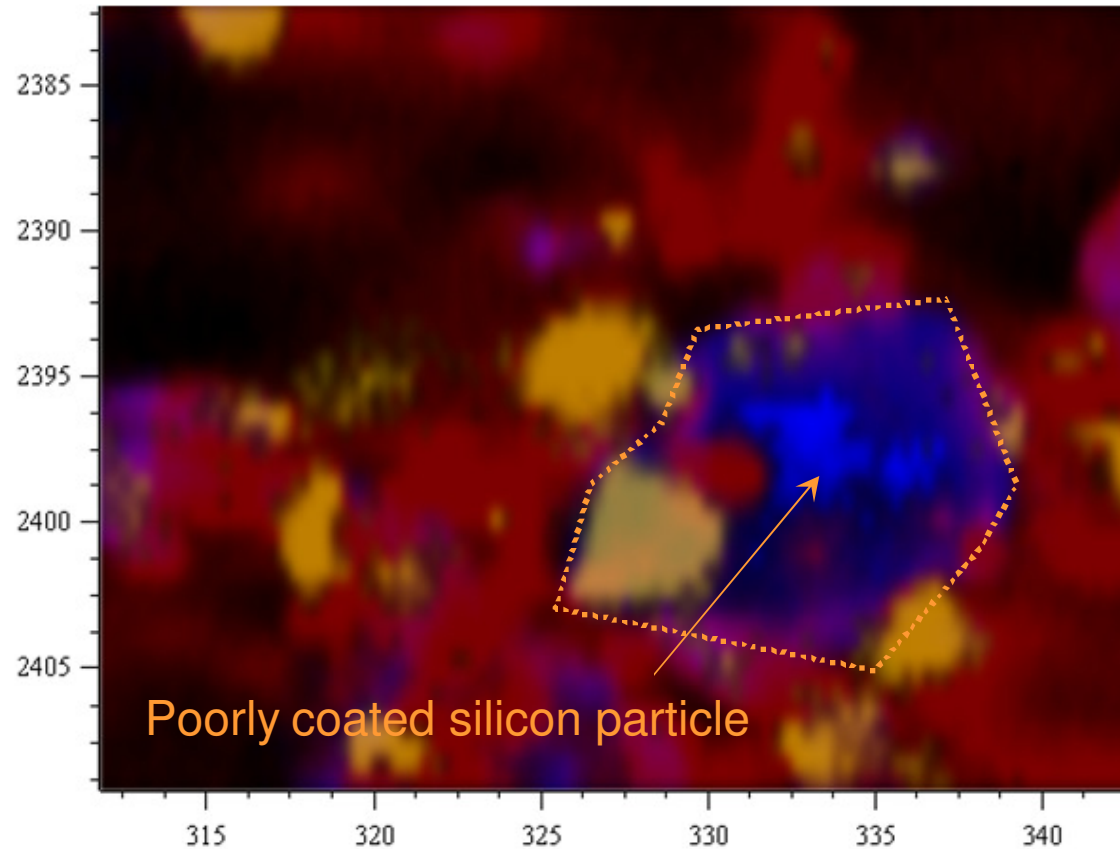
- StreamLine™ technology
 - Unique Renishaw technology (patented technique)
 - Enables very fast Raman imaging of samples
- Application areas
 - Materials science
 - Semiconductors
 - Polymers
 - Thin films & coatings
 - Biosciences



Carbon-coated silicon as anode material for next generation LIB



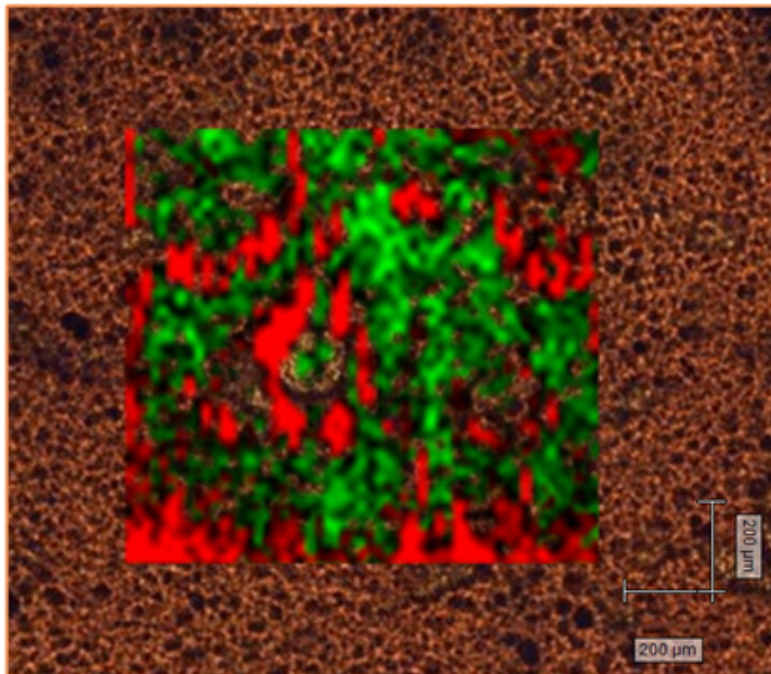
Renishaw in via Reflex
Streamline image
532nm
<0.02mW@sample
1800l/mm
[31x26 μ m]
4635 spectra



- Uniformity of the coating
- Crystal structure and structural disorder in silicon and carbon

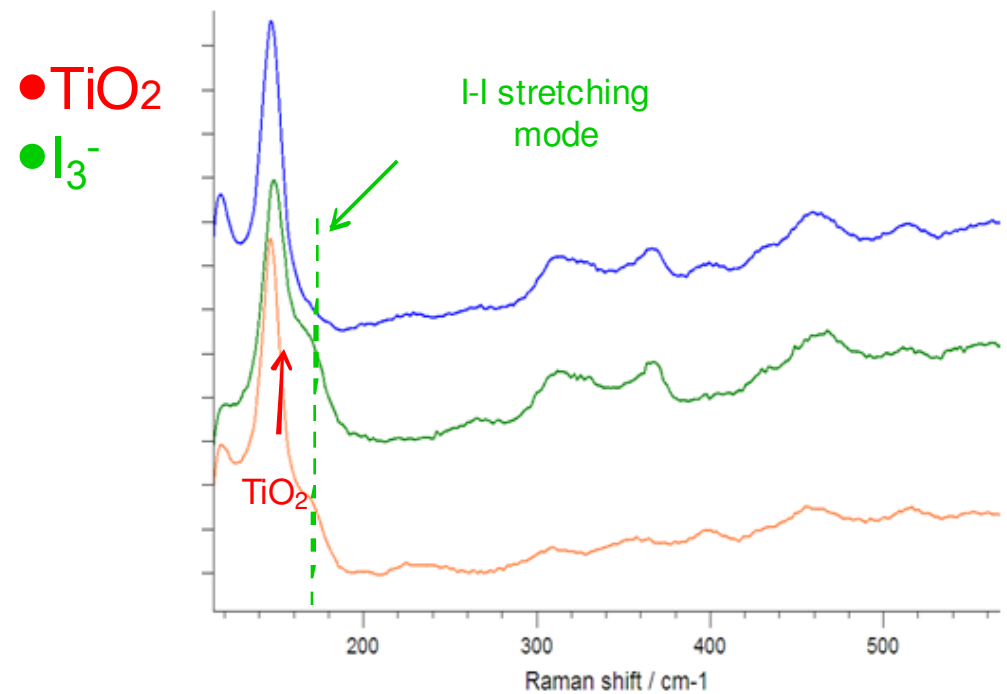
Analysis of dye-sensitized solar cells

Raman imaging of the surface layer of the electrode has been performed with the aim of visualization TiO_2 and I_3^- distribution.



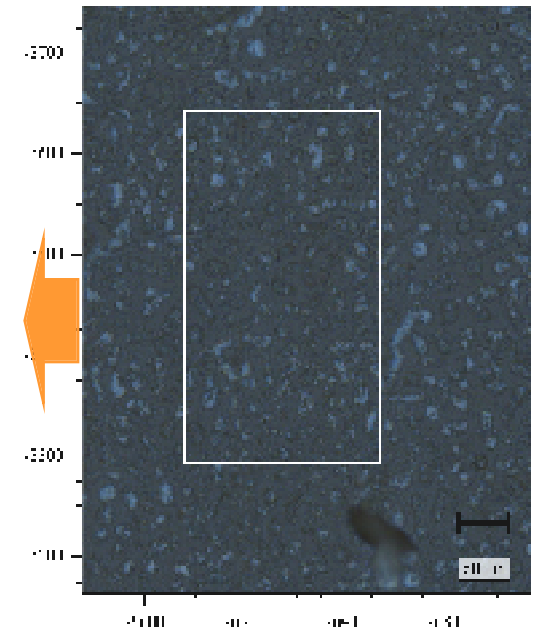
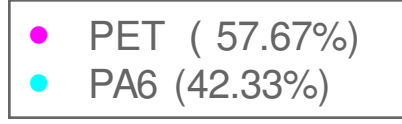
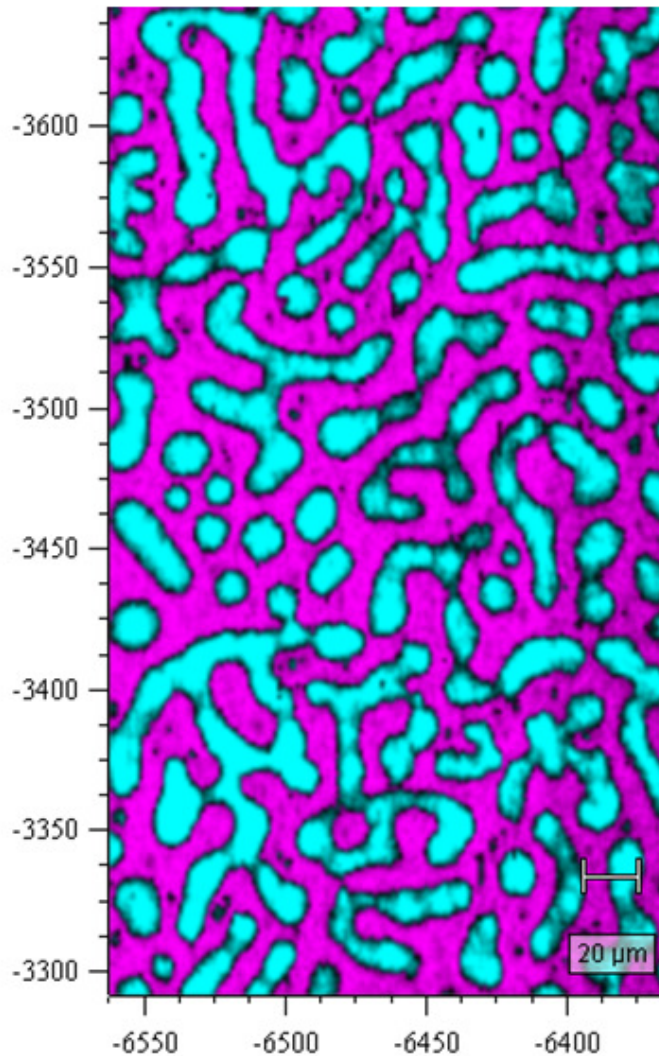
Distribution of components on the surface of the electrode

Streamline image acquisition, $1.0 \times 0.9 \text{ mm}$,
2,695 spectra



Examples of Raman spectra

Analysis of sea-island structure in polymer blend film

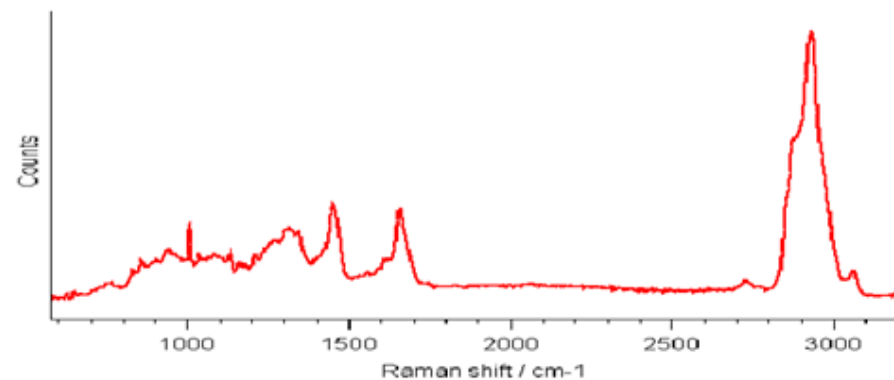
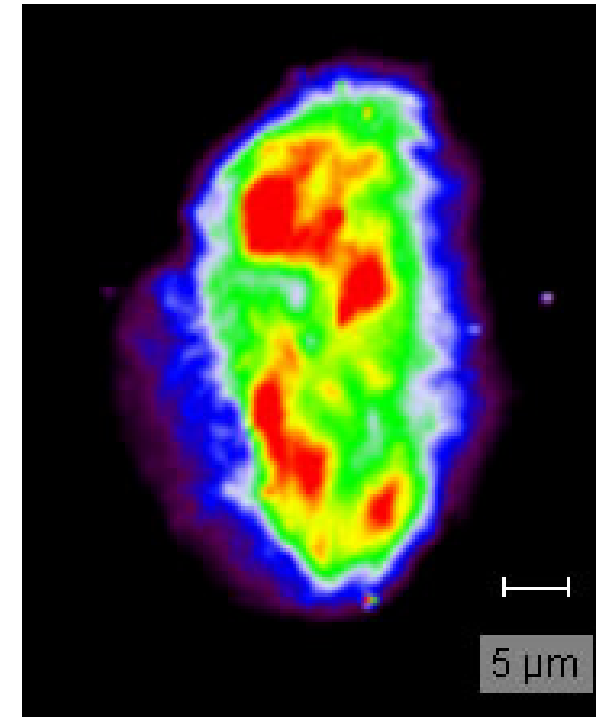
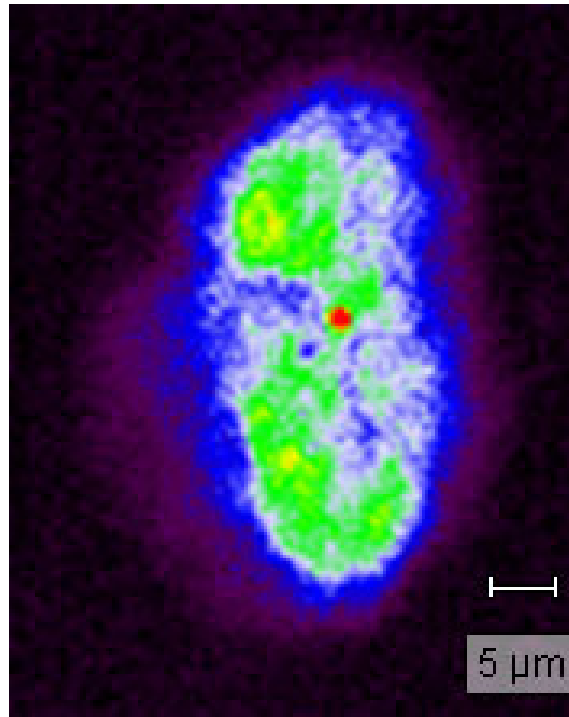


- Fast imaging of sea-island structure
- Macro to micro with high precision stage
- Semi-quantitative data analysis using chemometrics

Streamline image 532nm <0.6mW@sample
Grating: 1800 l/mm [196x351μm] [41192 spectra]

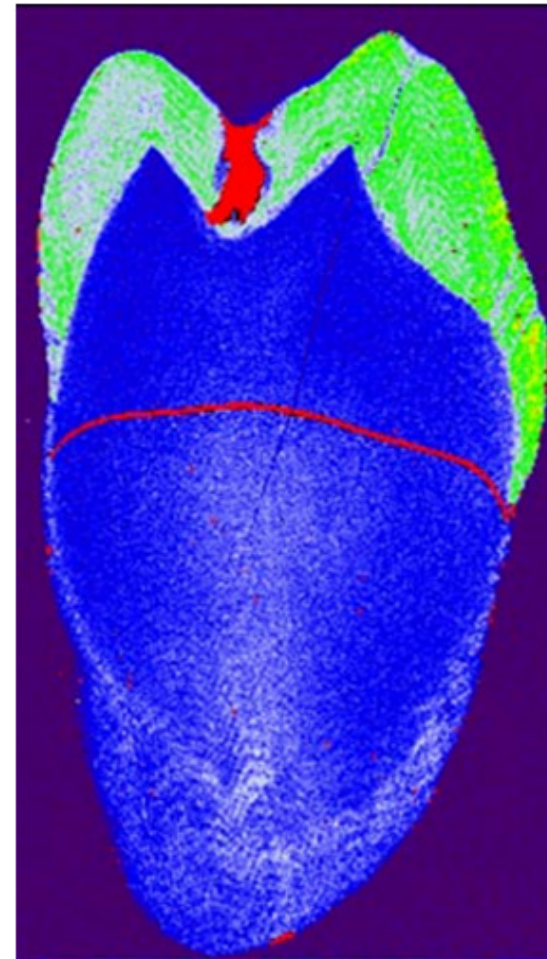
Cheek cell images in 7 minutes

- Cheek cell
- Cell size
 - 20 μm \times 42 μm
- Data set:
 - acquired in 7 minutes
 - 72 \times 111 data points
 - 7992 spectra
 - 50 ms per spectrum
- Analysis:
 - Left image: integrated signal between 770 cm^{-1} and 870 cm^{-1} associated with nucleic acids
 - Right image: integrated signal between 2700 cm^{-1} and 3100 cm^{-1}
 - sample thickness dominates



StreamLine™- whole tooth section in 58 minutes

- Tooth size
 - 16 mm × 9 mm
 - Sectioned down the centre
- Data set
 - acquired in 58 min
 - 216 x 389 spectra
 - 84000 spectra
- Image area
 - 16 mm × 9 mm
- Tooth containing:
 - Green: enamel
 - Blue: dentine
 - Red: areas of high fluorescence



StreamLine™ - speed comparisons

- Up to 100× faster than point-by-point mapping
 - Example: short exposure times per spectrum (seconds)
- Point-by-point imaging takes 100 minutes
- Rapid line-focus imaging takes 4 minutes
- **StreamLine™ imaging takes only 1 minute**



Renishaw inVia Raman microscope

- chemical & structural imaging, fast and easy!