

# Dragonfly Pro

Exclusive to ZEISS

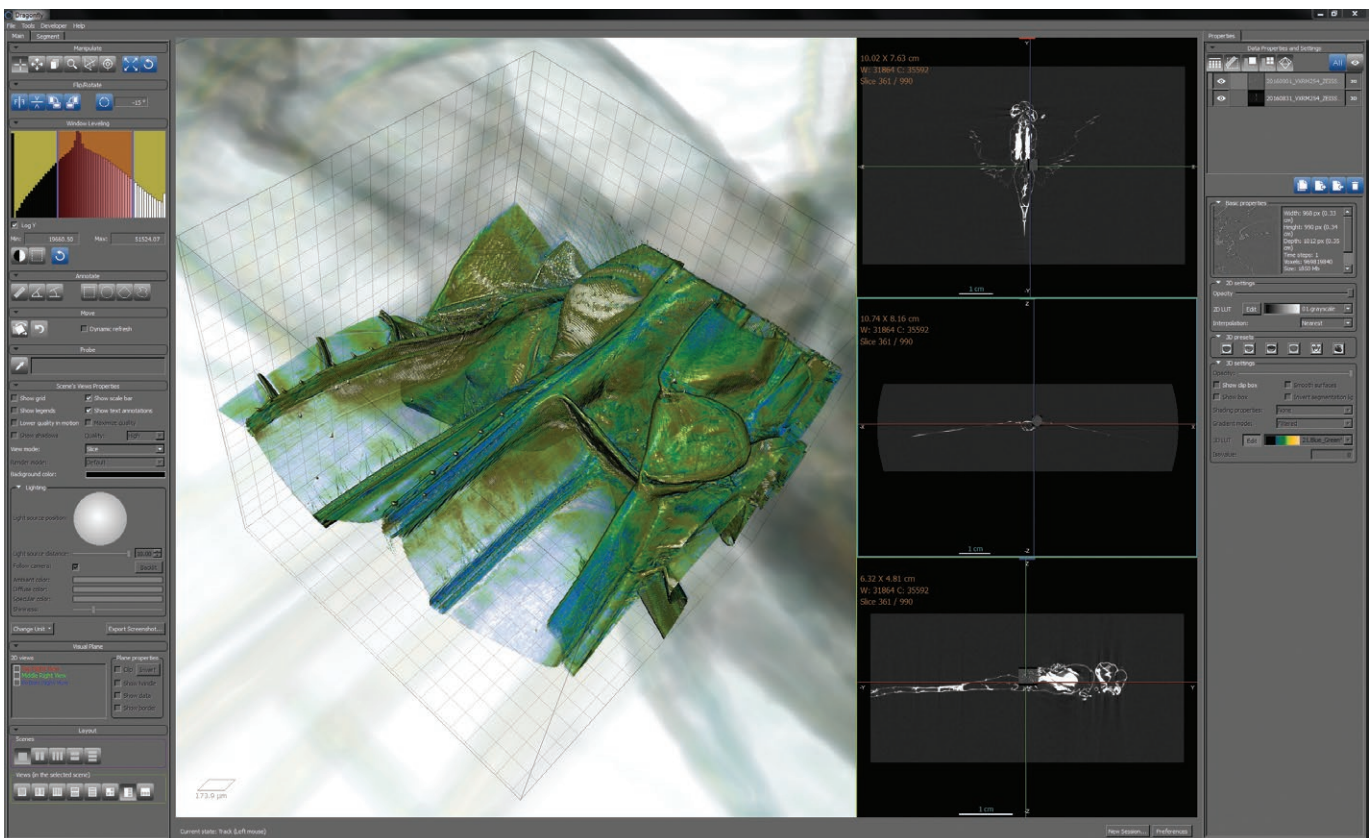
Visual Pathway to Quantitative Answers



# Visualization and analysis software without bounds

**Dragonfly Pro** by Object Research Systems (ORS) is an advanced visualization and analysis software solution for 3D data acquired by a variety of microscopy technologies, including X-ray, FIB-SEM, SEM and helium ion microscopes. Using advanced visualization techniques and state-of-the-art volume rendering, Dragonfly Pro enables high definition exploration into the details and properties of 3D datasets. It offers 2D and 3D image filtering modules and thresholding.

Dragonfly Pro has been built with an embedded Python engine, giving users customizable access and total control of their work environment. Create new features within the interface or add functions to tailor the software to the specific needs of your research. Segmentation within Dragonfly Pro can be performed in multiple ways. Innovative tools automatically and manually segment data. In addition, 2D histographic segmentation allows users to interact with multiple datasets mapped on a two-dimensional histogram for an enhanced ability to distinguish features of interest.



**Multi-dataset Scout-and-Zoom analysis of Spotted Skimmer Dragonfly.**  
Data captured by ZEISS Xradia 520 Versa FPX and 4x objectives

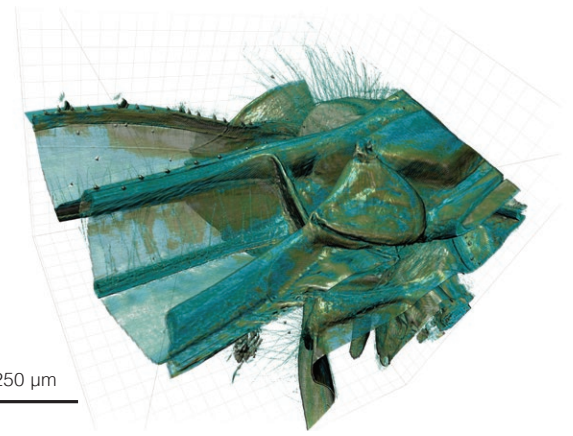
### Superior performance

Dragonfly Pro by ORS delivers advanced 3D imaging and analysis techniques with fast display speeds and the ability to handle large datasets.

### Flexible and configurable solution

Dragonfly Pro is a Python-configurable solution that allows you to tailor the tools that are optimal to your workflow.

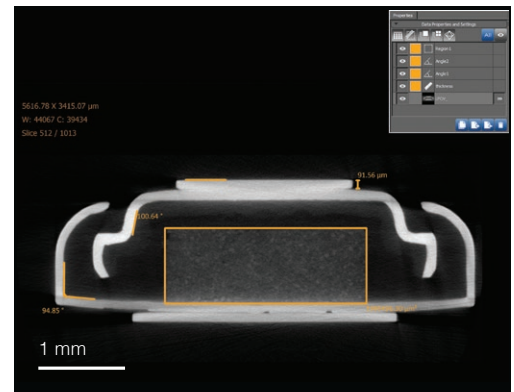
Dragonfly Pro also supports regular and unstructured surface meshes with a number of mesh plug-ins, as well as advanced editing tools to create a region of interest from a mesh and vice-versa. Meshes can be exported into industry-standard formats extending research to advanced physics and modeling software or 3D printing.



250 μm

**High definition visualization of Spotted Skimmer Dragonfly wing joint.**

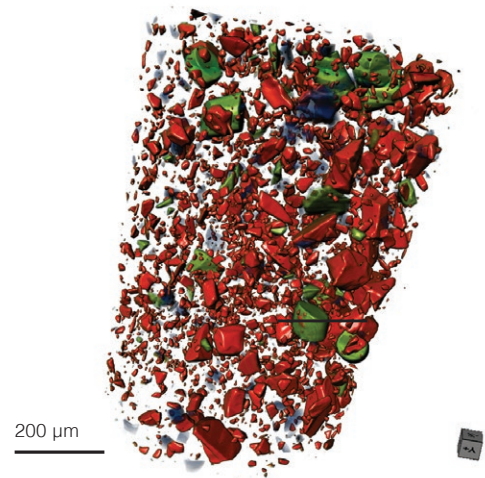
Imaged with ZEISS Xradia 520 Versa



**Measurement of a coin cell battery.**

Imaged by ZEISS Xradia 520 Versa

Courtesy: University College London, U.K.

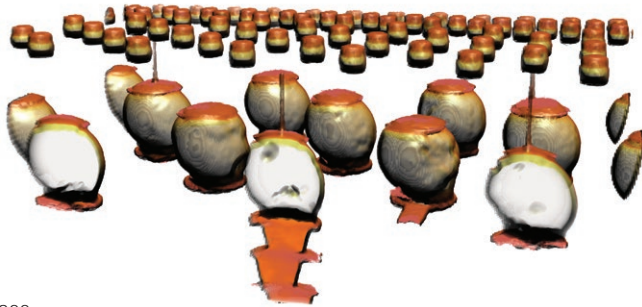


200 μm

**Segmentation of rock grains rendered by volume.**

Imaged by ZEISS Xradia 520 Versa

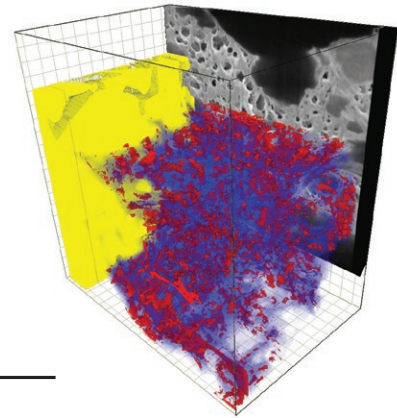
# Dragonfly Pro Applications & Examples



300  $\mu\text{m}$

**3D rendering of solderball interconnects, cross-sectioned to show voids/defect.**

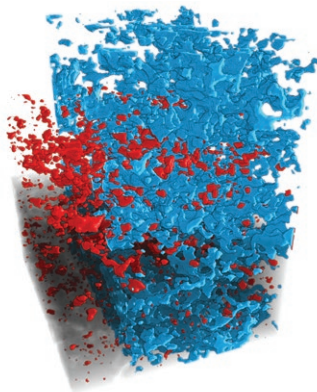
Imaged by ZEISS Xradia Versa



1  $\mu\text{m}$

**3D Helium-ion microscopy of segmented porosity (red) and organic material (blue).**

Imaged by ZEISS Orion Nanofab

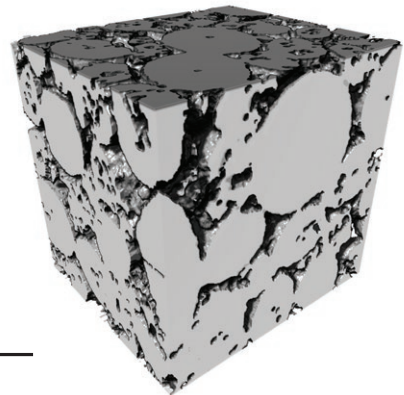


5  $\mu\text{m}$

**Visualization of connected (blue) and isolated (red) porosity of a thermal barrier coating.**

Imaged by ZEISS Xradia 810 Ultra.

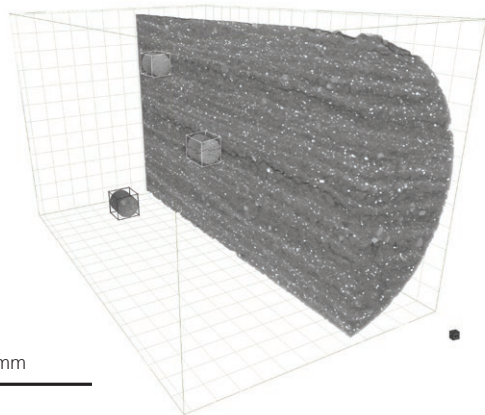
Courtesy: Chalmers University, Sweden



10  $\mu\text{m}$

**3D microstructure of a commercial Li-ion battery showing cracks and voids within the active particles.**

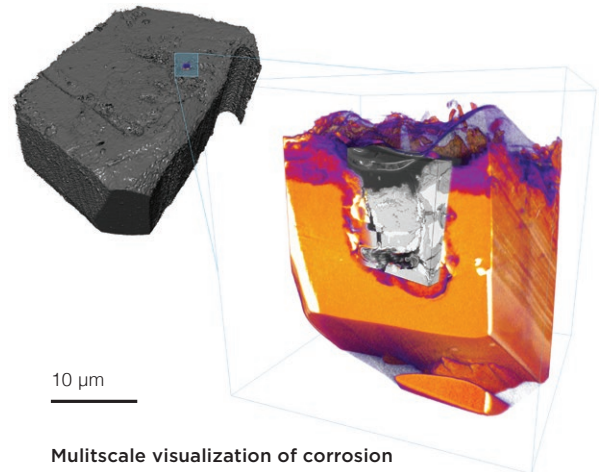
Imaged by ZEISS Xradia 810 Ultra



10 mm

**Scout-and-Zoom imaging performed on mudrock, identifying higher resolution regions of interest.**

Imaged by ZEISS Xradia 520 Versa



10  $\mu\text{m}$

**Multiscale visualization of corrosion damage of a magnesium alloy.**

Imaged using ZEISS Xradia 520 Versa, ZEISS Xradia 810 Ultra, and ZEISS Crossbeam 540  
Courtesy: The University of Manchester, U.K.

## Key Features / Benefits

### High-impact visualization

- Render volumes in high definition
- Flexibly inspect multi-planar slices
- Achieve high quality surface rendering
- Rapidly fuse and register multi-modal data to increase the information and accuracy of models

### Customize with Python

- Access the Python scripting console to make Dragonfly Pro your own
- Build new features
- Script routines
- Customize the environment to suit the needed workflows of your research

### User-interactive inspection

- Measure distances, angles, and paths
- Annotate features to highlight important findings
- Investigate intensity with spot-probes and line profiles
- Use histogram tools for statistical analysis
- Select magnifying glass for fast multi-scale visualization and inspection

### Analyze

- Study volume metrics including porosity, particle/void analysis
- Measure surface areas
- Measure min, max, and mean intensity values and standard deviation
- Profile intensity distribution within selected areas

### Image processing and segmentation

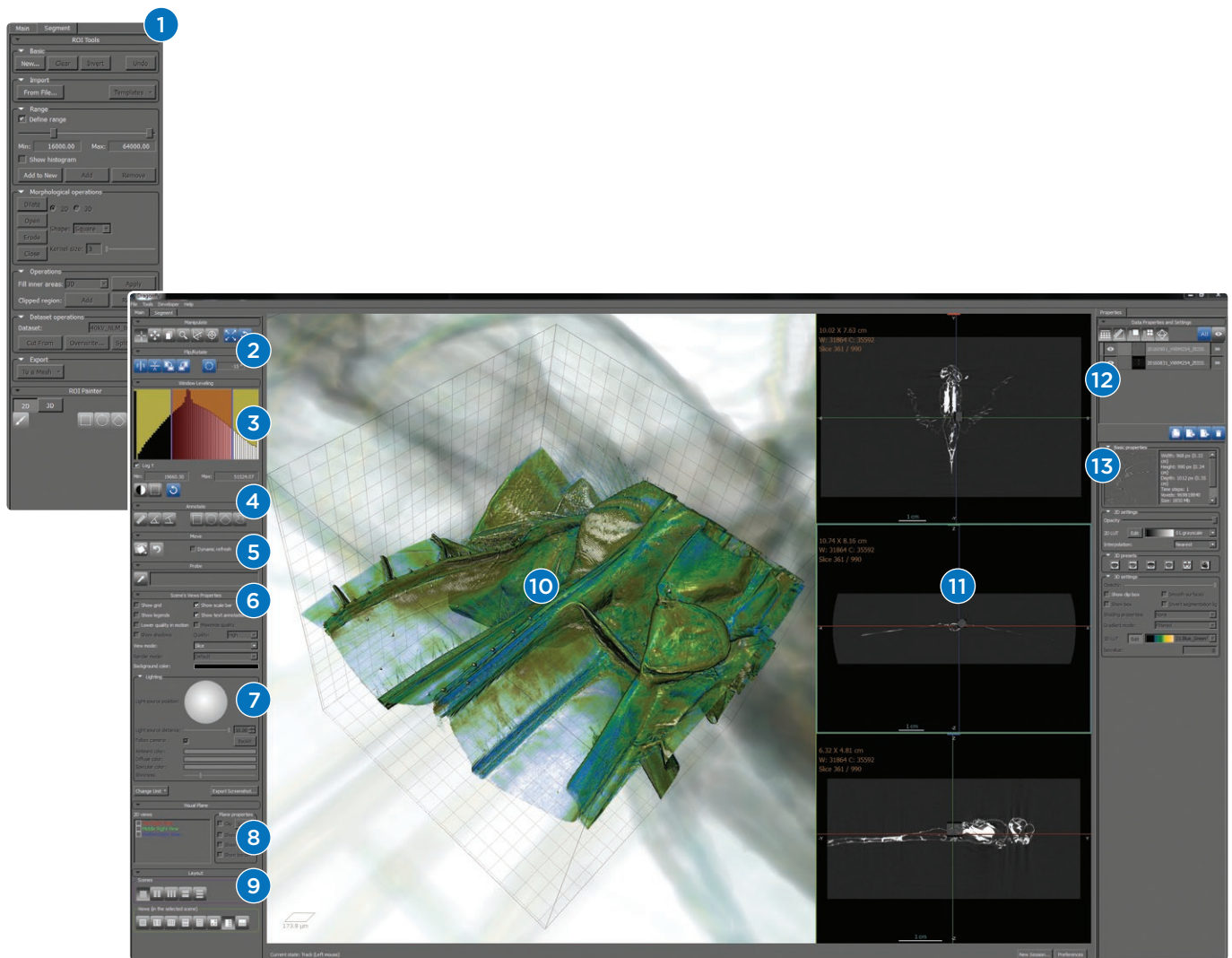
- Remove noise with state-of-the art algorithms
- Extensive image processing features
  - Arithmetic filters
  - Smoothing
  - Morphology
  - Edge detection
  - Shading correction
  - Contrast adjustment
  - Sharpening
  - Threshold techniques
  - Texture analysis
- Set thresholds based on intensity
- Apply intuitive masking operations
- Novel segmentation tool options, including interactive 2D histogrammic segmentation

### Showcase your results

- Reveal key insights with high-resolution screenshots
- On-screen playback directly within the application with an easy-to-edit timeline that shows the chronological arrangement of keyframes and events
  - On-screen playback directly within Dragonfly Pro
  - Captured in a stack of image files (JPG, BMP, TIFF, PNG)
  - Produced directly to an AVI file

# Intuitive Graphical User Interface

- 1 Advanced segmentation panel
- 2 Navigation tools
- 3 Brightness and contrast
- 4 Measure and annotate
- 5 Registration and alignment
- 6 Scene view tools
- 7 Environment lighting
- 8 Visual plane control
- 9 Series views and layout
- 10 3D Viewport
- 11 2D Viewports
- 12 Data properties and settings manager
- 13 Object information and action panel



## Technology and Details

For use with ZEISS SEM, FIB-SEM, X-ray, and helium ion microscopes

### Import data

Image formats

ZEISS TXM, TIFF, BMP, RAW, PNG, JPEG, REK, DAT, MRC, Analyze 7.5

Mesh formats

ASCII, BREP, CS FDB, DirectX, IGES, OBJ, PLY, STEP, STL, VRML, VTK polydata (VTK), VTK polydata XML (VTP), VTK unstructured grid (VTK), MESH, ORS Binary, 3D Studio Max

### Export data

Image formats

TIFF, BMP, RAW, PNG, JPEG, Analyze 7.5, DDS, DIB

Movie formats

AVI (various aspect ratios)

Mesh formats

OpenInventor 2.0, STL, VRML, WaveFront, VTK, MESH, ORS Binary, PLY

Save session

ORS Session

### Hardware recommendations

Windows 7 or greater (64-bit versions)

Multi-core CPU

Workstation-class dedicated 3D graphics card (Nvidia Quadro or ATI FireGL)

RAM sized at >2X typical dataset size



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[info.dragonfly-pro.com/home.html](http://info.dragonfly-pro.com/home.html)