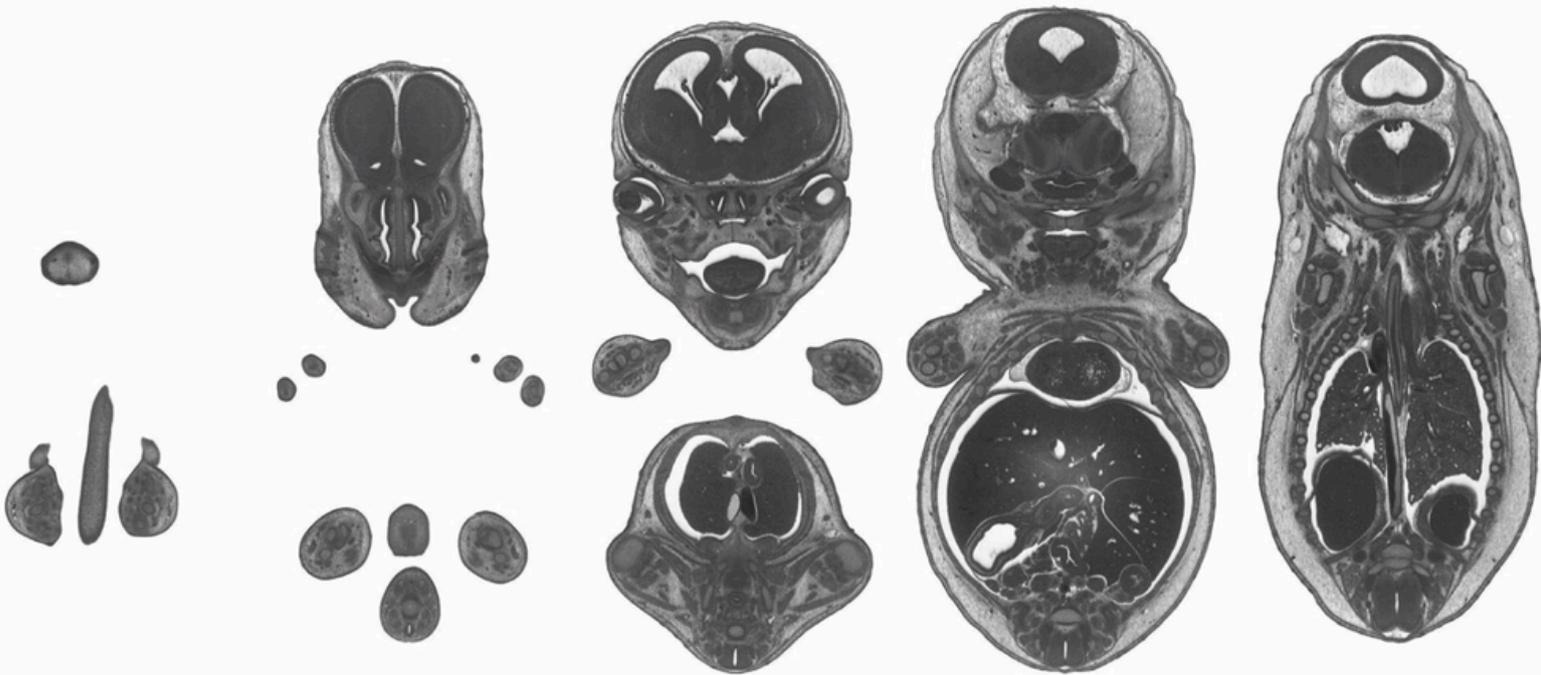


Optical High Resolution Episcopic Microscope (OHREM)



Visualise Detail in Larger, Denser, Samples in 3D with OHREM Instruments

OHREM 3D Imaging Systems



High-Resolution Episcopic Microscopy (HREM)

Advanced 3D Imaging for Biological and Medical Research

❖ About Indigo Scientific

Indigo Scientific is a UK-based **imaging systems company** with over 20 years' experience in optical solutions. We specialise in HREM imaging instruments, delivering advanced **3D analysis technology** worldwide.

► Introduction to HREM

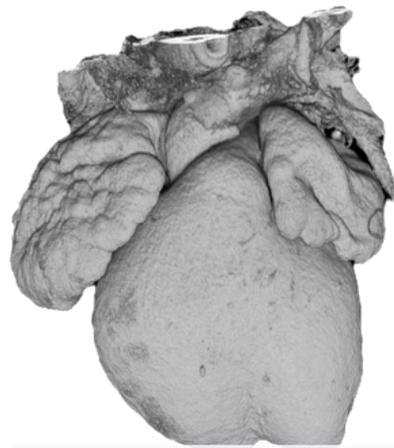
HREM generates **full histology detail 2D datasets** of perfectly aligned images that create **3D morphological data** with voxel sizes below 1 micron. Whole samples can be imaged, from **individual organs** to structures **up to 25 mm**, in a single dataset.

► How HREM Works

The HREM technique works by capturing the block's surface and combining the images into equally spaced sections that form a volume. These volumes can then be measured and analysed down to **1-micron voxel sizes**.

∴ Advantages to HREM

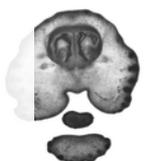
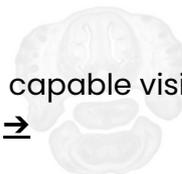
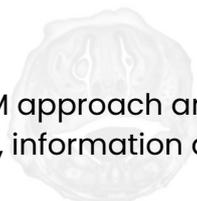
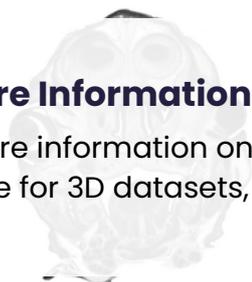
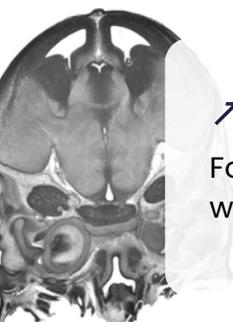
- **No clearing** required and no image interpolation or distortion
- Capture **dense tissue and bone** with high contrast and clarity
- Produce aligned 3D datasets with **1–8 micron voxel sizes**
- Easily manipulate image datasets



👁 Mouse heart (credit: Dr Aseel Abbad)

↗ More Information

For more information on the HREM approach and what is capable visit our website for 3D datasets, example, information and more ➔



HREM Applications

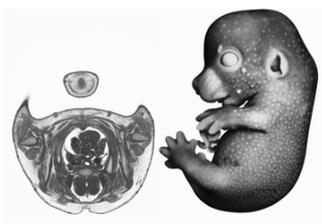
Proven in Applications from Mice to Plant Structures

HREM is widely used in **publications worldwide** to study a broad range of specimens. From **mice to plants**, it has many applications, and its high contrast on dense, complex samples often makes it the preferred choice over conventional techniques.

Sample sizes can range from under 1 mm to as large as 25 mm, with even larger experimental samples possible using imaging capabilities of **up to 60 mm**.

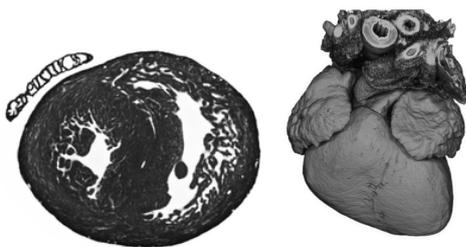
► Embryonic Mice

HREM has been used to study **whole embryonic mice** in many publications, highlighting subtle morphological changes that are often unseen with other techniques.



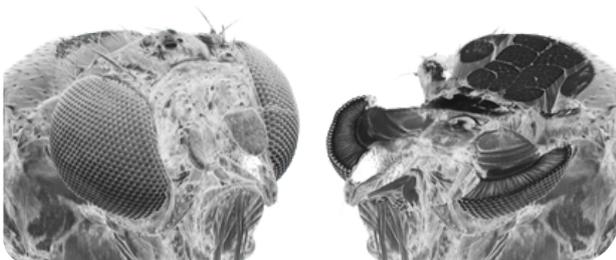
► Mouse Organs

Image **mouse hearts** and other organs at various stages of development, a popular sample type for HREM. As well as kidneys, placenta and more.



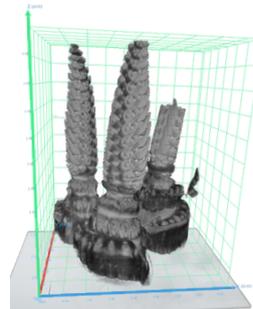
► Insects

Image dense **insect structures** with ease, including the Drosophila fly.



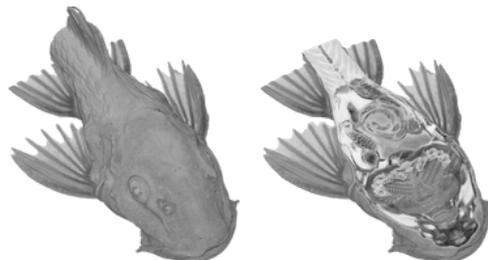
► Plant Matter

Study whole **plant morphology** in samples such as barley, citrus fruit, and seeds.



► Fish

Whole **zebrafish, catfish**, and other common study specimens, imaged as whole organisms or as extracted organs.



∴ Much More

Examples include crocodile skin, chicken embryos, mouse brains, tumours, human skin, and more.

For video examples and additional samples, visit:
<https://www.indigo-scientific.co.uk/3d-optical-hrem-imaging/hrem-examples>

Optical HREM Products

Products Custom Built and Tailored to Application

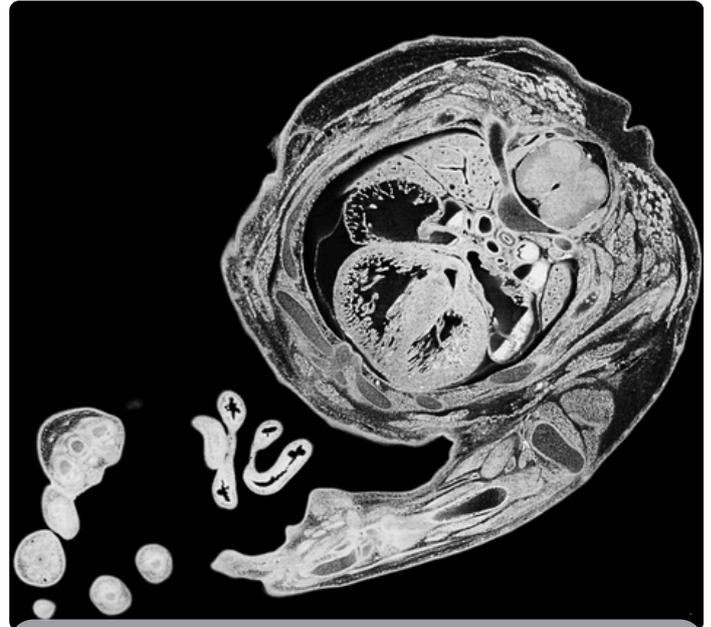
Indigo Scientific produces complete High-Resolution Electron Microscopy (HREM) setups, including consumables and imaging instruments, all assembled in the UK. They offer two systems: Micro and Ultra, both providing high-quality 3D image stacks.

OHREM Micro

The Micro offers **3D image generation** in a compact, simple form factor with a small footprint. It is designed for throughput operations, providing **single-shot** imaging of whole samples.

Micro systems offer the same OHREM image quality while making the technology more accessible to all labs and settings. With a monochrome 20-megapixel output, the Micro delivers single-shot, high-resolution images ideal for 2D and 3D analysis of dense, complex structures.

The instrument features a highly accurate encoded Z-stage that supports sample heights **up to 25 mm**, enabling block imaging at 1-micron section spacing.



Embryonic Mouse Section Captured with HREM Micro

∴ Micro Summary

- Fast, high-resolution **20-megapixel imaging**
- Compact and economical form factor for smaller labs
- Ideal for labs starting with HREM imaging workflows
- Simple **front-facing design** for easy setup
- Upgradeable to **multiple fluorescence channels**



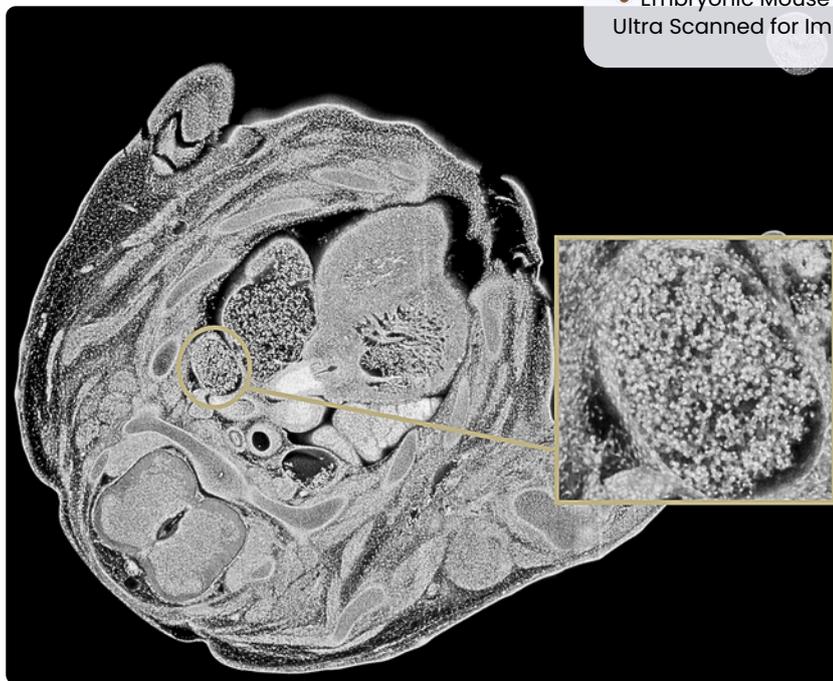
OHREM Ultra

Ultra systems offer **flexible imaging modes**, supporting both **multiple fluorescence channels**, with a wide range of additions and options for enhanced imaging.

Ultra features a larger form factor that accommodates an **automated XY scanning stage**, enabling scans of up to 60 mm using various magnifications. This also allows **multiple blocks** to be imaged in a single run.

With the Ultra system, experiments can be driven by the resolution required rather than the size of the sample. Throughput can be increased by imaging several samples in one run.

Ultra systems come standard with a **30 mm Z-range**, which can be extended to 50 mm to support larger samples.



Embryonic Mouse Section Captured with HREM Ultra Scanned for Improved Resolution

∴ Ultra Summary

- Imaging for samples up to a **60 mm FOV** with scanning
- Designed for **multiple fluorescence** applications as well as standard HREM
- Compatible with 60 mm, 80 mm, and 160 mm blades
- Simultaneously image **up to 4 samples** in one run

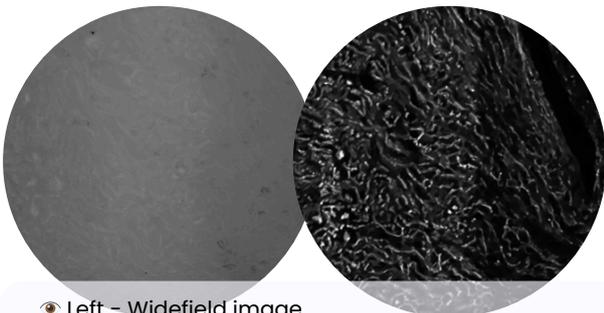


Consumables, Options & Upgrades

Our HREM systems offer various upgrades and workflow options to **enhance capabilities** for specialized applications, including increased contrast, fluorescence imaging, improved optical performance, and integration of custom hardware.

Structured Illumination

Enhance image clarity and contrast for stained samples by reducing out-of-focus information with a structured illumination upgrade.



- Left - Widefield image
- Right - Structured illumination enhanced image

Multi-channel

Add custom illumination channel configurations for **dye-based experiments** and labelling to enhance block-face imaging.



- Embryo with Lac-Z

↗ Further Upgrades

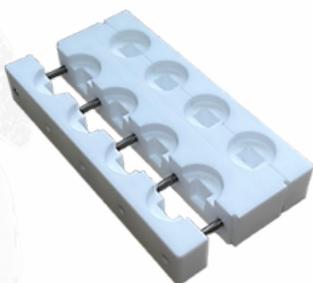
We offer a range of **additional options** to tailor the system to your imaging needs, including upright optics and alternative camera sensors. For more advice, please **contact us**.



- HREM Ultra Scanning Upright Upgrade

Split Moulds

Split moulds offer advantages over traditional moulds, including **heat resistance** for thermal processes, full customizability in size, and an easy extraction process for taller blocks due to their split design.



Sample Bases

Sample bases, made from **bondable plastics** for OHREM instruments, fit into the holder and feature a grooved design that enhances surface adhesion, resulting in a stronger, more stable structure during cutting.



HREM Software

Software for HREM Datasets

We provide a strong **starting point** for HREM images, enabling most of the functions and manipulations researchers require. Our image stacks are compatible with 3D software packages such as Imaris, Dragonfly, Fiji, and others.

► OHREM Acquire

Optical HREM Acquire is included with every system, providing full control of the Optical HREM platform. With dedicated tools designed to make HREM imaging easy, the software.

- Control of both Micro and Ultra systems with tools for improving efficiency and ease of use
- Integrated stitching for larger fields of view
- Directory management and saving tools
- Feature requests and updates from users

► Translation Tools

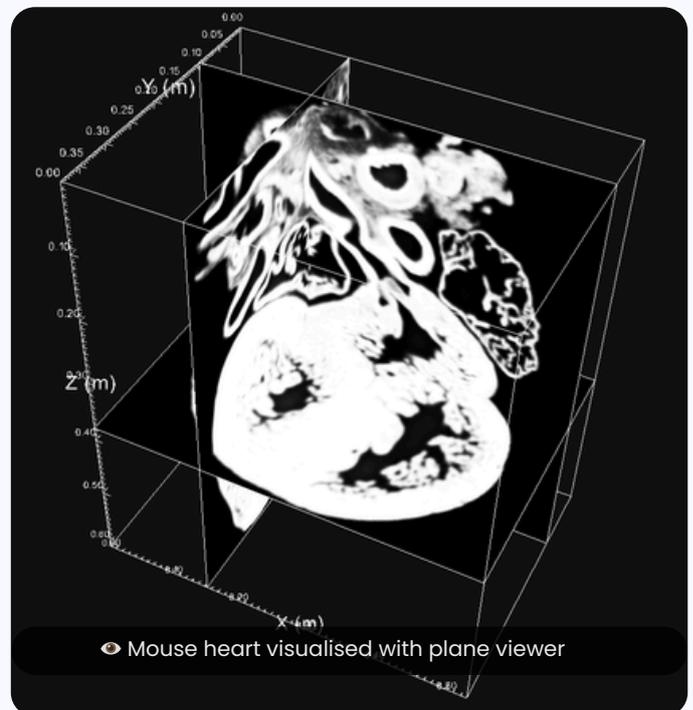
Combine whole stacks or **individual images** using the translation tool's stitching wizard, offering flexible methods for assembling HREM or other biological images.

- Montage large images with manual or automated tools
- Apply montages across entire stacks
- Save magnification pre-sets (1x, 2x, 5x, 10x)
- Align mismatched stacks using the overlay tool

► 3D Viewer

Easily transform **2D image stacks into 3D data** with a lightweight, license-free viewer designed for effortless sharing and fast HREM processing. You can try a HREM dataset in the 3D viewer on our [website](#).

- Generate 3D models
- Built-in fast HREM inversion pipeline
- Live window and level adjustment
- Crop models on the fly to reveal fine detail
- Video creation present and share with colleagues
- STL Wizard for creating 3D printable models from stacks, without holes



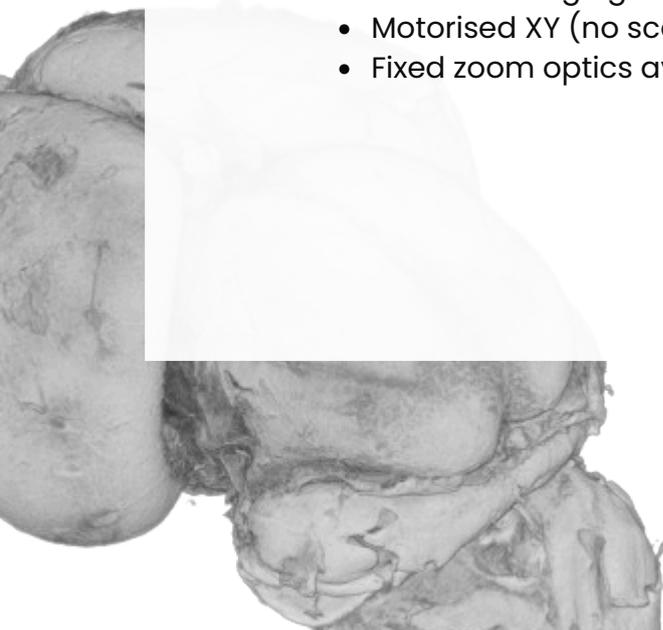
More Information

For more information on our custom software, for use with HREM systems visit: <https://www.indigo-scientific.co.uk/software>

Specifications

Specifications for HREM Systems

	Optical HREM Micro	Optical HREM Ultra
Overview	Smaller form factor HREM imaging instrument with single shot capabilities	Flagship model with dual channel and XY scanning stage for flexible HREM imaging
Optics	Zoom optics (FOV: ~2mm - ~25mm) or fixed objective	Zoom optics (FOV: ~2mm - ~25mm) or fixed objective
XY	Fixed XY Stage with slight XY adjustments for sample centering.	XY Stage for scanning, multiple samples, positioning with range of 80mm
Max Sample Size/FOV	25 x 25 x 25	60 x 60 x 30 (with scanning)
Digital Output	20 Megapixel, 12-bit monochrome, tif/tiff/jpg/jpeg etc.	20 Megapixel, 12-bit monochrome, tif/tiff/jpg/jpeg etc. Higher sensitivity/lower resolution available on request.
Channels	1 Morphology channel	2 Channels including morphology channel
Options/Extras	<ul style="list-style-type: none"> • Dual/multi-fluorescence and focus adjustment, • Different imaging capabilities • Motorised XY (no scanning) • Fixed zoom optics available 	<ul style="list-style-type: none"> • 2 position sample holder • 4 position sample holder • Dual extraction for multi-samples • Dual/multi-fluorescence and focus adjustment • Different imaging capabilities • Structured Illumination • Increased Z height to 50mm • Upright compound optics available • Whole system desk controller



Get In Touch

Contact Our Team

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