

# DoubleHelix<sup>®</sup>

Lorem ipsum

## Introducing the SPINDLE<sup>®</sup>

3D imaging and tracking with unrivaled precision

### Select from a range of advanced applications

#### Super-resolution:

Reconstruct 3D super-resolution images with the best precision-depth combination and no axial stitching,

Nanoscale precision for both axial and lateral localization.

#### 3D particle tracking:

Extended depth enables capture of longer particle tracks and faster acquisition.

#### Extended depth of field:

Single-shot depth range up to 20x clear aperture

#### Spatial omics:

Maximize signal, minimize scanning, and increase throughput

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*We expect that the DH-PSF optics will become a regular attachment on advanced microscopes, either for super-resolution 3D imaging of structures, or for 3D super-resolution tracking of individually labelled bio-molecules in cells or other environments.*

*Professor W.E. Moerner, Nobel Laureate  
Stanford University*

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Double Helix's SPINDLE<sup>®</sup> gives researchers the ability to easily capture and analyze 3D images of cellular structures down to the single molecule level.

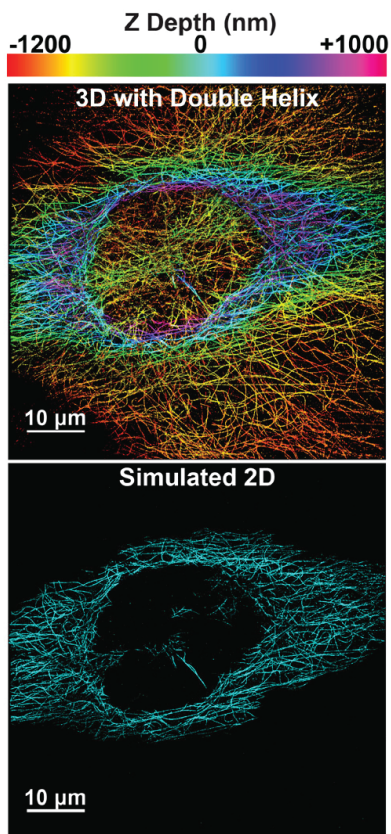
Using Double Helix's patented technology as its foundation, the SPINDLE<sup>®</sup> can be easily installed on existing microscopes to enable advanced 3D imaging and tracking with super-resolution capabilities. Built-in bypass mode allows for easy return to non-3D experiments.

### Transform your R&D with instant, advanced 3D capabilities

- **Patented phase mask** design overcomes traditional limitations enabling 3D imaging with unparalleled depth and axial precision
- **Select from a library of masks** optimized to the emission wavelength needed for your 3D experiment.
- **Compatible with a wide range** of microscopes, objectives and cameras



Replaceable mask to fit with your wavelength and application needs



**3D Double Helix super-resolution reconstruction of microtubules labeled with AlexFluor 647.** D3D with Double Helix ePSF and simulated 2D reconstructions showing z depth encoded in color. The Double Helix 3D image captures a depth of 2.2 µm. The simulated 2D reconstruction of the same image shows 1 µm of z depth (-500 to +500 nm) and does not contain axial localization information.

## Affordable and adaptable

**Small footprint** allows easy installation even in space-constrained environments

**Input and output F- and C-mount adapters** provide easy support for commercial and custom-built microscopes and cameras

**Highly reliable system** with no moving parts. Switchable phase mask cartridges, auxiliary emission filter holders or maximum experiment flexibility

**Modular design** evolves your existing system into an advanced 3D imaging system with super-resolution capabilities

## Intelligent data analysis

### 3DTRAX® software, a FIJI plugin provides

- Modules available for 3D SMLM, 3D tracking, and extended depth whole-cell imaging
- SMLM module calculates the position of every particle
- 3D tracking localizes and tracks particles over entire depth range of PSF
- Whole cell extended depth of field imaging sees deeper into sample without scanning
- Automated drift correction available in all modules
- **Intuitive plots** help ensure quality data throughout the analysis process
- **Flexible file export** for extended analysis
- **Quantitative analysis**

## Specifications

Dimensions	200 mm x 84 mm x 84 mm
Single Shot Depth Range	2-20x clear aperture
Field of View (FOV)	Up to 25 mm diagonal
Precision	Up to 15 nm
Light efficiency	> 95%
Mask library wavelength range	UV to near-IR

\*Custom masks available upon request

Precision specifications listed are based on results generated using Double Helix mask library and will vary according to NA of the objective used and the photon count of the specific experiment. Precision may be better than indicated.

## About Double Helix Optics

Double Helix Optics enables visualization and data capture of objects at an unmatched depth and precision quality. Its engineered point-spread function-based technology is advancing the field of 3D imaging, allowing for new discoveries in research and new capabilities of promise to a range of applications. The SPINDLE<sup>2</sup>, SPINDLE<sup>®</sup>, engineered phase masks, and 3DTRAX<sup>®</sup> software are currently in use by globally recognized scientists.

To learn more contact us at [imaging@doublehelixoptics.com](mailto:imaging@doublehelixoptics.com) | [doublehelixoptics.com](http://doublehelixoptics.com)