



# PlantScope

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Plant Microscopy System with  
Automated Root Tip Tracking



## PlantScope Vertical

PlantScope is the ideal turnkey microscopy system for plant research. Live tracking while imaging enables the study of dynamic biological processes such as cell growth, cell division, organ development and organ tropisms. PlantScope Vertical features a lateral microscope stand that preserves microscope functionality and optimizes the optical path for imaging plants in a natural, vertical orientation.



### Fully Automated Research Microscope

Custom-designed lateral stand retains all standard functionality  
Motorized objective and path selection  
PSF-optimized objectives

## PlantScope Xero

Maximize light efficiency with optional full-system-rotation 90 degrees for imaging specimens in vertical and horizontal orientation.



### Spinning Disk Confocal

Live cell 3D confocal imaging up to 200fps with wide field of view 16mm x 17mm  
Motorization including disk exchange, disk bypass, variable aperture, camera port selection and camera port magnification  
Options for split-view imaging, NIR imaging, illumination field flattening and super-resolution imaging

### Motorized Vertical Stage

Plants grow in a natural upright position  
Motorized X,Y translation

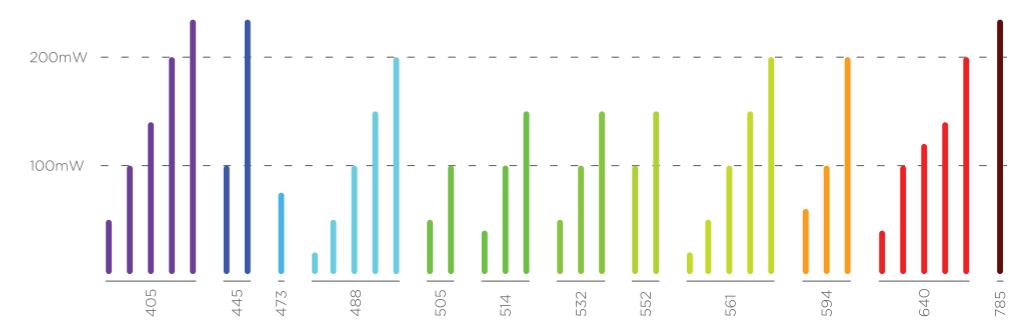
### NIR LED and Finder Camera

850nm LED ring light for transmitted light imaging  
Finder camera for easy sample location



### LaserStack with Fiber Switcher

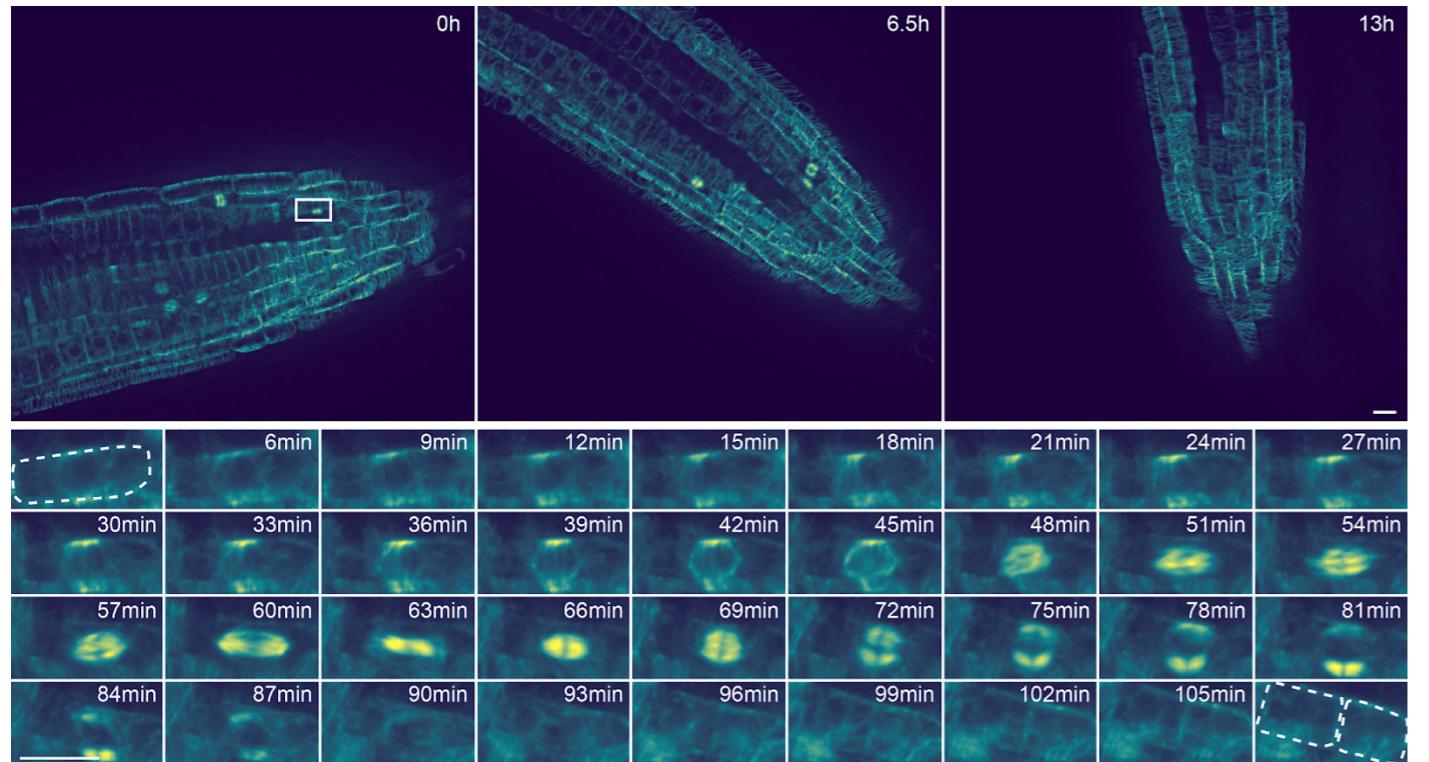
Modular laser combiner with up to eight lasers  
Up to four fiber outputs with millisecond path switching



# Uncovering the Dynamics of Plant Development

## Automated Root Tip Tracking

SlideBook's automated root tip tracking allows you to follow root tips while imaging for hours or even days. Root growth can also be captured as a montage so that at each time point the tip, meristem, elongation and differentiation zones are captured, resulting in complete developmental trajectories.



### ARABIDOPSIS ROOT

Gravitropic experiment of an *Arabidopsis* root expressing microtubule marker (MAP4-GFP). Courtesy of the Fendrych laboratory, Institute of Experimental Botany of the Czech Academy of Sciences Prague.



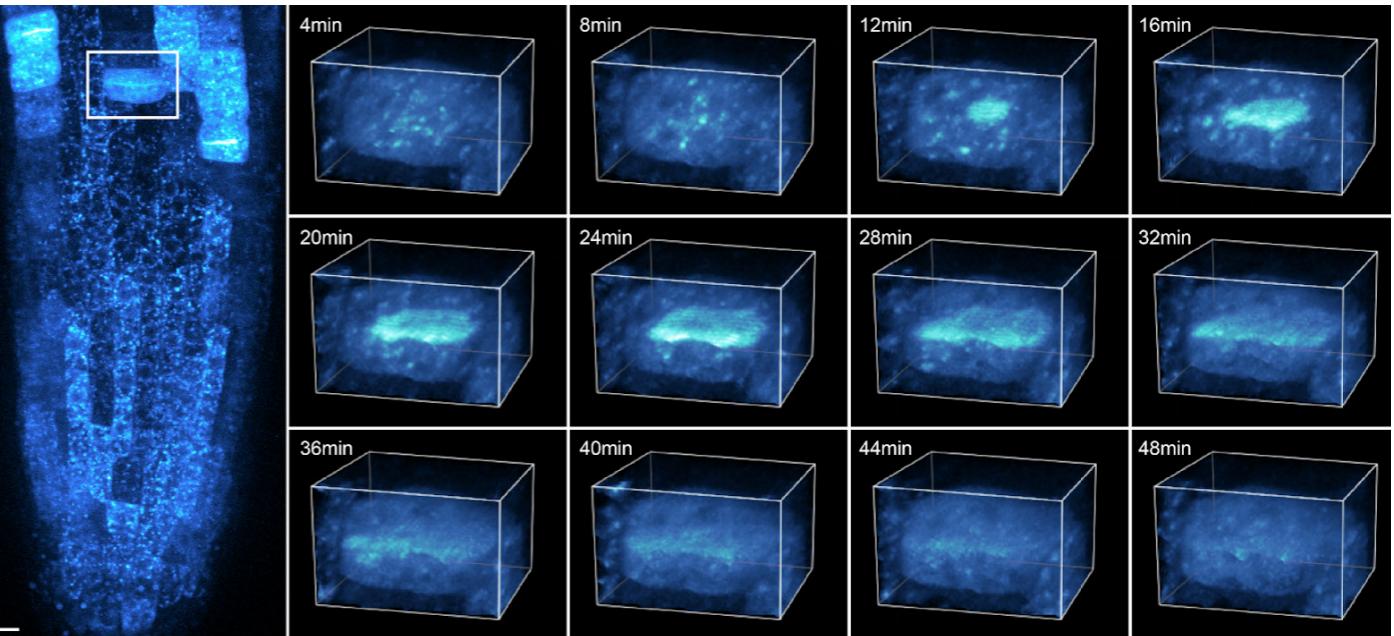
## Natural Growth and Lighting

The vertical stage allows plants to grow upright in their natural orientation, ensuring physiological relevance and authentic developmental processes. Controllable day/night grow light cycles stimulate natural photosynthetic activity, keeping your plants healthy throughout long-term imaging experiments. A near-infrared transmission ring light provides transmission imaging without interfering with plant biology.



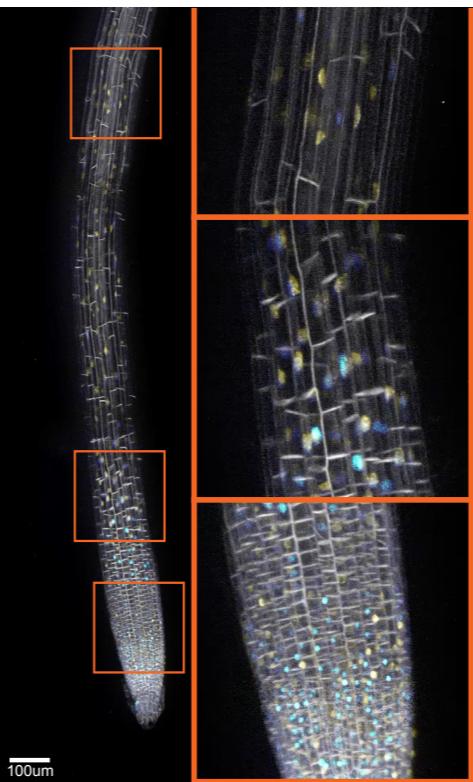
## 4D Spinning Disk Confocal Imaging

At the heart of PlantScope, a spinning disk confocal provides high-resolution, high-speed multicolor imaging with exceptional sensitivity. As a result, the dynamics of cellular development can be seen in real-time and in 3D at sub-cellular resolution. PlantScope also supports a wide range of other imaging modalities including transmitted light, epifluorescence, photomanipulation, laser ablation, TIRF and adaptive optics.



### SUB-CELLULAR AND IN 3D

Endosomal GFP-tagged protein. Courtesy of Dr. Michael Sauer, University of Potsdam.



### (LEFT) ARABIDOPSIS ROOT

PlantScope uses tip tracking while acquiring a tiling montage of the entire root, capturing simultaneous dynamics from cell division at the tip to differentiation further up. Courtesy of Nolan Laboratory, California Institute of Technology.



**(ABOVE) BARLEY SHOOT APICAL MERISTEM**  
Courtesy of Dr. Beáta Strajčková, Centre of Plant Structural and Functional Genomics Institute of Experimental Botany of the Czech Academy of Sciences Olomouc.



SlideBook software supports research microscopy through the entire experimental process. By managing everything from instrument control to image processing and data analysis, SlideBook allows scientists to focus on investigation rather than instrumentation. SlideBook controls hundreds of instruments in and around the microscope from dozens of manufacturers enabling researchers to integrate their preferred components and upgrade to the latest devices once available.

## User-Selectable App Appearance

Select a color scheme from dozens of options  
Switch on-the-fly from dark to light themes

## SlideBook Open File Format

Directory-based open file format for big data and high performance computing applications

## Volume Rendering

3D and 4D volume view visualization tools support a user-specified bounding box and a storyboard interface where multiple perspectives can be assembled into a single movie



## NVIDIA CUDA GPU Acceleration

GPU acceleration of computationally-intensive operations such as deconvolution

## Montage and Multipoint Capture

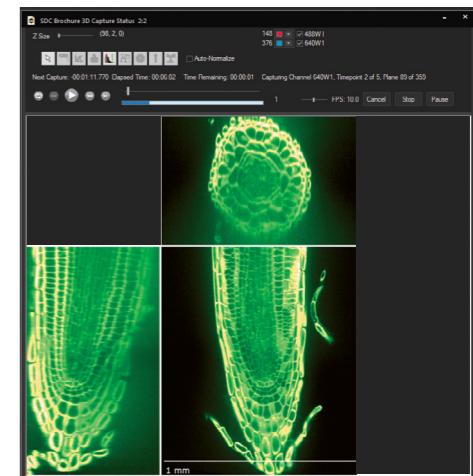
Streamlined montage and multipoint capture interfaces  
Automated montage/stitching with a variety of methods

## Automated Root Tip Tracking

Automatically follow root tips while imaging  
powered by SlideBook Synergy

## 3D Capture Status

Volumetric projection during 4D capture supported  
across all instruments



## Capabilities

### Capture

Control hundreds of devices including microscopes, stages, lasers, wheels, piezos, scanners, shutters and much more.

### View

Visualize data through any numbers of portals, from single images to z-stacks, time lapse, color channels and 4D views.

### Analyze

Analyze images and extract statistical data via a wide variety of algorithms while maintaining original data integrity.

### Scripting

Macro scripting for capture and analysis enhances the flexibility and power available to users.

### Communicate

Present and export data easily as 16-bit TIFFs, 3D movies, graphs or spreadsheets. Data is directly portable to MATLAB and Excel and adheres to Open Microscopy Environment (OME) standards.

### MATLAB

Through hierarchical and conditional capture, user-supplied MATLAB programs can control experimental workflows.

### Aivia

Aivia is an innovative and complete 2D-to-5D image visualization, analysis and interpretation platform with artificial intelligence-guided image analysis.

## Partners

### Microvolution

Microvolution® software delivers nearly instantaneous deconvolution by combining intelligent software programming with the power of a GPU.

### Dell

The latest high-power computer workstations control all microscope hardware and enable high-speed processing, segmentation and volume rendering of terabyte (TB) datasets.

# Support and Maintenance

A variety of software and equipment support levels help keep systems running well for years. A Software Support Agreement allows labs to run the latest version of SlideBook with new acquisition and analysis features. It includes direct access to 3i staff via email, phone and video chat. A System Maintenance Agreement adds an annual preventative maintenance visit, 3i service visits and 3i coordination of any repairs, although repair and replacement parts are not included. A System Extended Warranty adds full coverage for repairs and replacement parts. Additionally, 3i application scientists may provide in-person and webinar-based application training.

	Software Maintenance	System Maintenance	System Warranty
Phone, Email and Video Chat Support			
SlideBook Software Releases	 	 	 
Service Visits and Annual PM Visit			
Repairs Coordinated by 3i			
Application Training   In-Person or Online			
Full Warranty Coverage of all System Hardware			

## BUILT BY SCIENTISTS FOR SCIENTISTS

3i designs and manufactures technologies for living cell, live cell, and intravital fluorescence microscopy including superresolution, computer-generated holography, spinning disk confocal, multi-photon and lightsheet. SlideBook software manages everything from instrument control to image capture, processing and data analysis. 3i was established in 1995 by a group of cell biologists, neuroscientists, and computer scientists to provide advanced multi-dimensional microscopy platforms that are intuitive to use, modular in design, and meet the evolving needs of investigators in the biological research community.



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