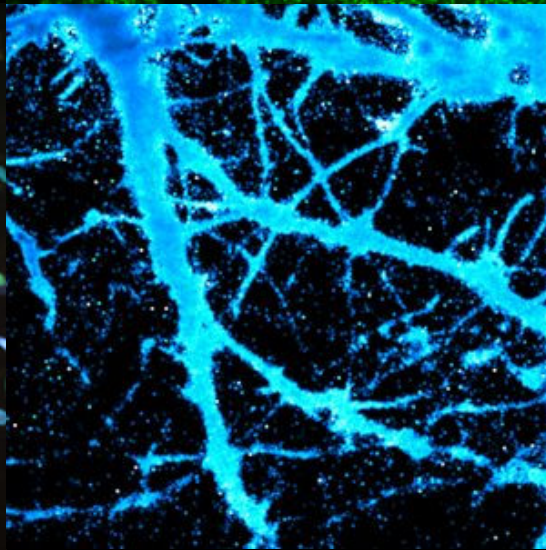
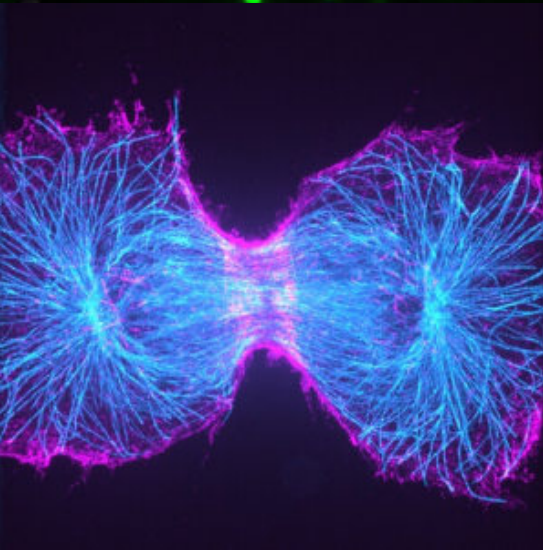
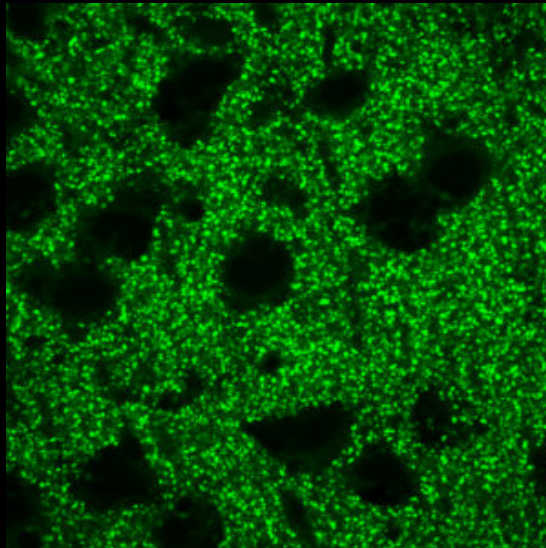
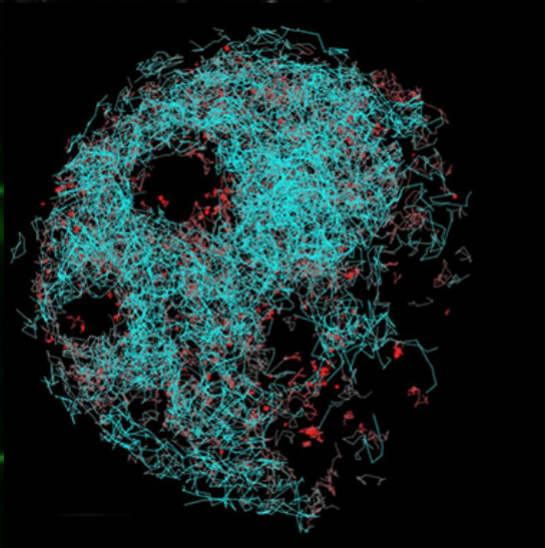
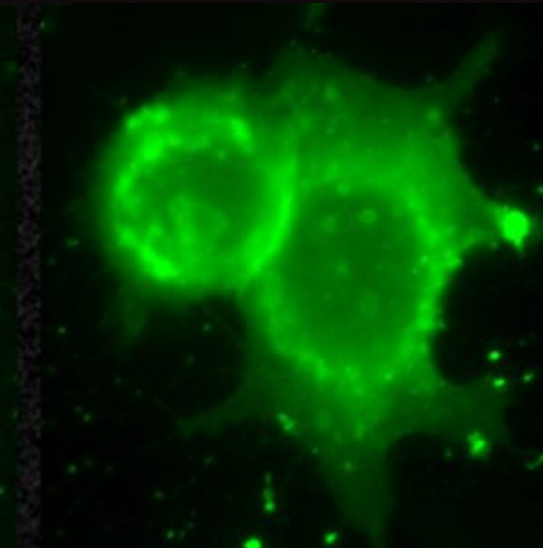
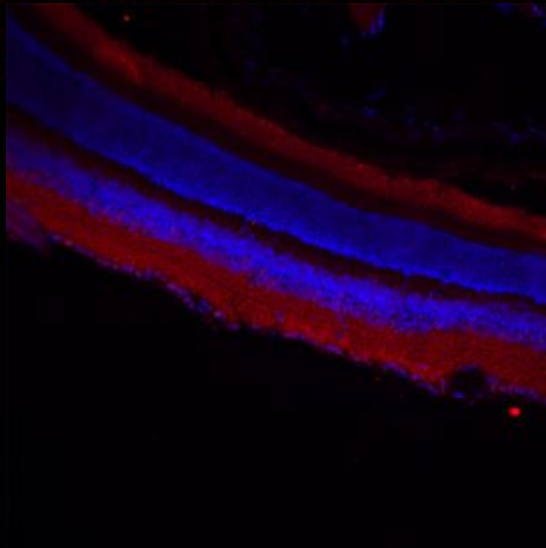
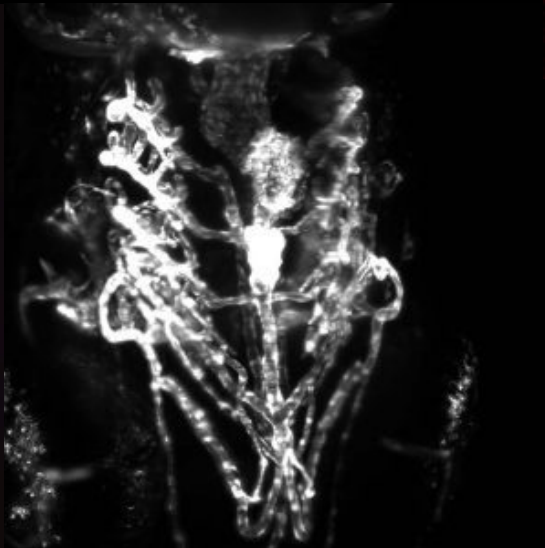
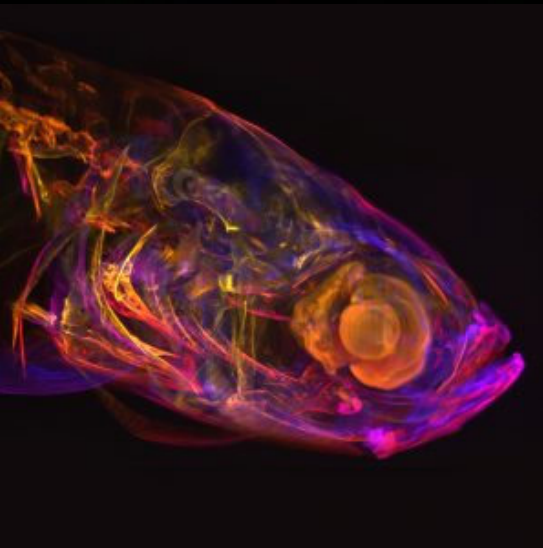
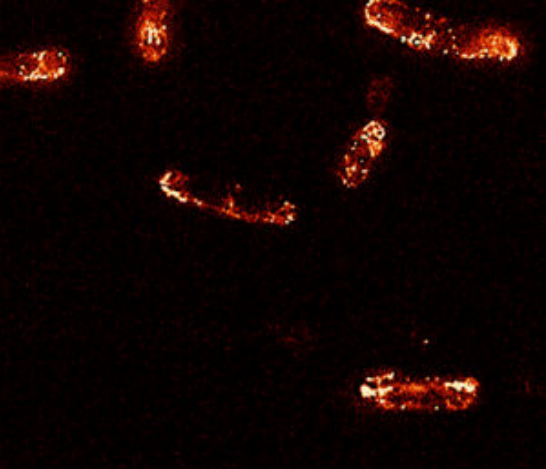
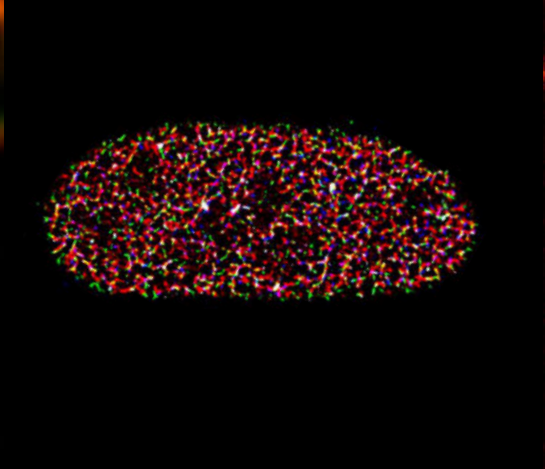
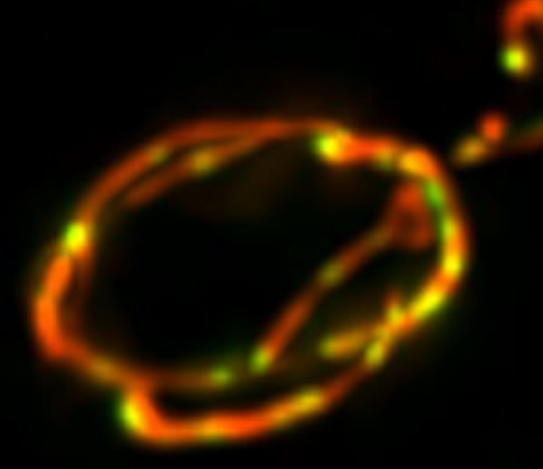


# Teledyne Photometrics

Advanced Imaging Camera Technology

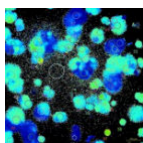


# Teledyne Photometrics: Product Overview

At Teledyne Photometrics, we develop and manufacture cutting-edge scientific cameras. Our camera range contains options for every scientific application, from single-molecule fluorescence microscopy to high-content screening, and across life sciences, physical sciences and engineering.

This short brochure offers an introduction to the world-leading research performed with our cameras, and an overview of our product range.

For more detailed information, visit our website at [www.photometrics.com](http://www.photometrics.com).



## Our Customer Stories: Page 3

Read about what researchers are doing with our products. Alternatively, check out our Customer Stories [website page](#).



## HIGHLIGHT: Kinetix sCMOS: Page 4

The highest speeds, highest sensitivity and largest field of view in low light imaging. Read more about the Kinetix [here](#).



## Prime 95B: Page 5

The first Back-illuminated CMOS camera with 95% QE, the Prime 95B uses large pixels for incredible sensitivity. Read more [here](#).



## Prime BSI Express: Page 6

Combining high speed, high resolution and high sensitivity in a compact package. Read more about the Prime BSI Express [here](#).



## Evolve EMCCD: Page 7

For the lowest of the low-light signals, EMCCDs offer sensitivity down to the single photon level. Read more [here](#).



## Iris Family: Page 8

The Iris family offers incredible resolution and massive field of view for high content, light sheet and more. Read more [here](#).



## Moment: Page 9

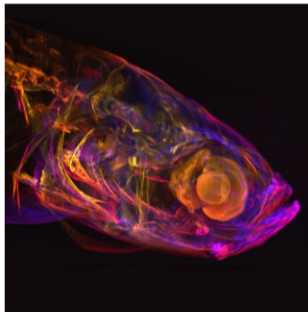
Ultra-compact, fast and simple, the Moment offers high speed with a true global shutter. Read more [here](#).

# Our Customer Stories

Our customers tell the story of Teledyne Photometrics best. Each image below represents a researcher's story, introducing their imaging challenges and how our products met their needs. Click the images to read their stories.

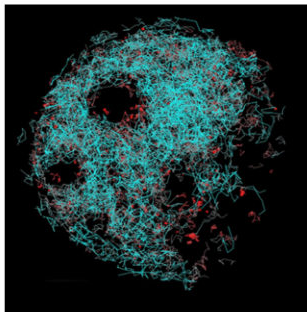
[Check our website](#) for dozens more researchers' accounts in their own words.

Light Sheet Microscopy



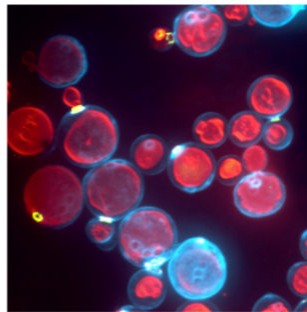
Dr Jan Huisken  
Morgridge Institute for Research

Single Molecule Tracking PALM



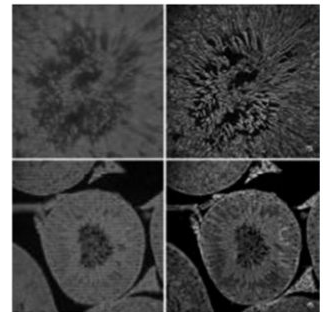
Antony Carr Group  
University of Sussex

Live Cell Imaging of Yeast Vacuoles



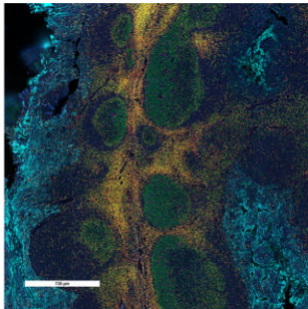
Prof. Andreas Mayer  
Universite de Lausanne

Structured Illumination Microscopy



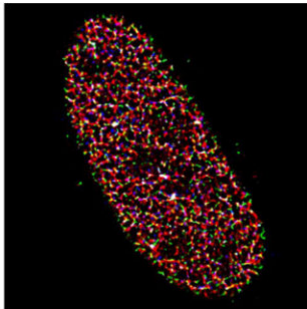
Dr. Guy Hagen  
University of Colorado

High Content Multiplex Fluorescence



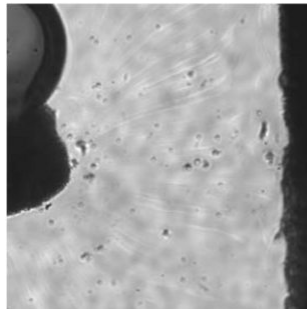
Dr. Sonia Leonardelli  
University of Bonn, Germany

STORM Super Resolution Microscopy



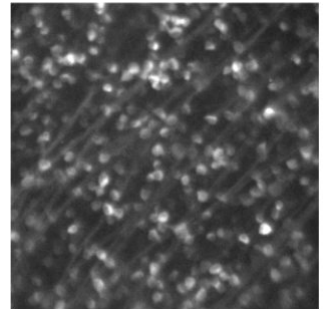
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New York University, School  
of Medicine

Single Molecule Biophysics



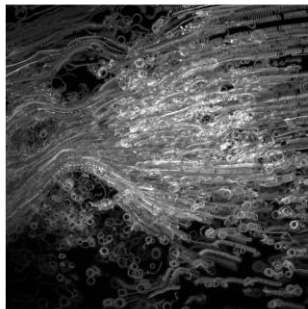
Dr. Kevin Freedman  
University of California Riverside

Functional Calcium Retinal Imaging



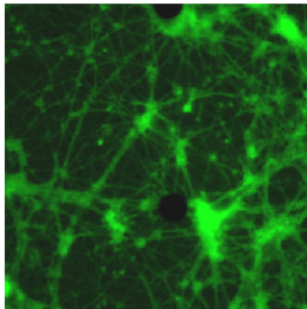
Prof. Maximilian Jösch  
IST Austria

Live Cell Imaging



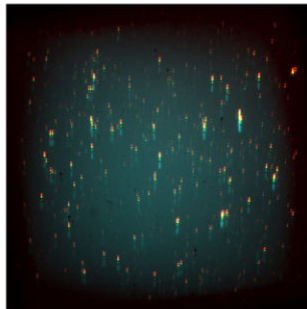
Friedrich Frischknecht Group  
Heidelberg University Medical  
School

Voltage Imaging



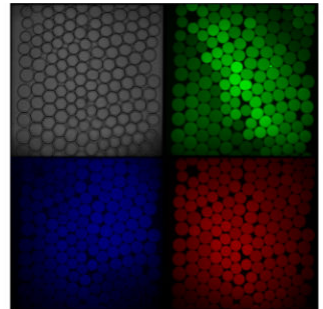
Dr. Miguel Aroso  
University of Porto

Single Molecule DNA Imaging



Jonathan Jeffet  
University of Tel-Aviv, Israel

Dynamic Microfluidic Imaging



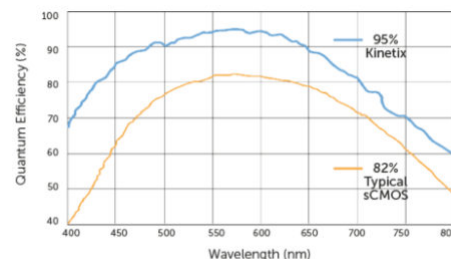
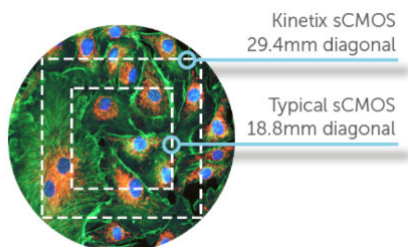
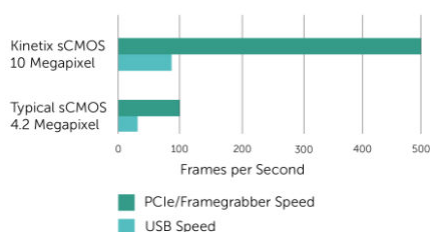
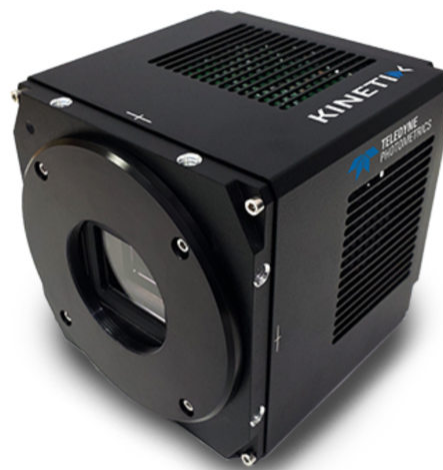
Dr. Georg Krainer  
University of Cambridge

# Product Overview: Kinetix

## KINETIX

The back-illuminated Kinetix Scientific CMOS (sCMOS) camera delivers the fastest speed and the largest field of view with the most balanced pixel size and near perfect 95% quantum efficiency. Adding to this a 0.7e- read noise mode makes the Kinetix the most versatile low-light imaging camera ever made.

- **500 Frames per Second**
- **29.4 mm Diagonal Field of View**
- **95% Quantum Efficiency**
- **6.5  $\mu\text{m}$  x 6.5  $\mu\text{m}$  Pixel Area**
- **Now with 0.7e- Read Noise mode**



### Extreme Speed

Taking advantage of an 8-bit readout mode, the Kinetix sCMOS delivers a tremendous 500 frames per second (fps), full frame with a 29.4 mm diagonal field of view.

The optimized line time allows the speed to significantly outperform typical sCMOS devices, delivering over 5000 megapixels/second – over a 10-fold improvement.

### Large Field Of View

The 29.4 mm square sensor of the Kinetix is designed to increase throughput, maximize the amount of data captured in a single frame and take full advantage of new, larger field of view microscopes.

At 29.4 mm diagonal, the Kinetix sensor has a 2.4x larger imaging area than typical sCMOS cameras allowing the user to significantly speed up data acquisition.

### High Sensitivity

The Kinetix back-illuminated sCMOS camera achieves a near-perfect 95% quantum efficiency.

By bringing the light in from the back of the sensor, photons land directly onto the light receiving surface, maximizing light collecting capability.

The Kinetix combines 95% quantum efficiency with the new 'Sub-Electron' mode delivering 0.7e- of read noise.

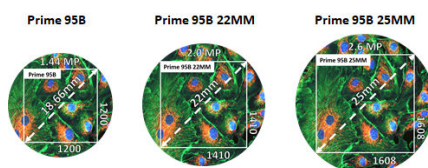
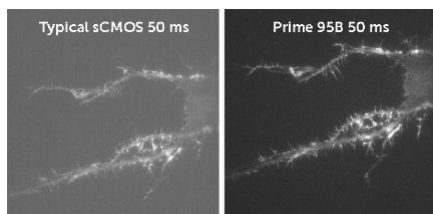
[Click here](#) to learn more about the Kinetix sCMOS!

# Product Overview: Prime 95B



Outperforming EMCCD cameras, the Prime 95B Scientific CMOS (sCMOS) camera series includes several back illuminated sCMOS cameras that offer 95% QE with extreme sensitivity and high frame rates.

- 95% Quantum Efficiency
- 11  $\mu\text{m}$  x 11  $\mu\text{m}$  Pixel Area
- 3 Field of View Options



## Sensitivity

The Prime 95B back-illuminated sCMOS camera achieves a near-perfect 95% quantum efficiency.

By bringing the light in from the back of the sensor, photons land directly onto the light receiving surface, maximizing light collecting capability. Combining this with large, 11  $\mu\text{m}$  pixels results in a camera technology as sensitive as EMCCD with greater stability, faster speeds and no gain aging.

## Multiple Fields of View

The Prime 95B is available with an 18.8, 22 or 25 mm diagonal field of view. The larger format sensors are designed to increase throughput, maximize the amount of data captured and take full advantage of new, larger field of view microscopes.

## Advanced Triggering

Sequenced Multiple Acquisition Real Time (SMART) Streaming enables the Prime 95B to capture a continuous sequence of images while cycling through 16 pre-programmed exposure time values, delivering the fastest multi-channel acquisition times.

The Prime 95B also supports up to four expose-out signals and has the capability for an effective global shutter.

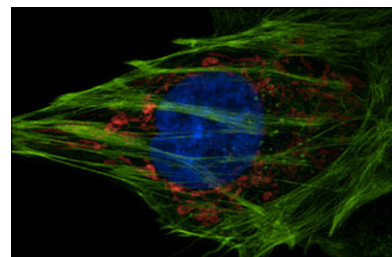
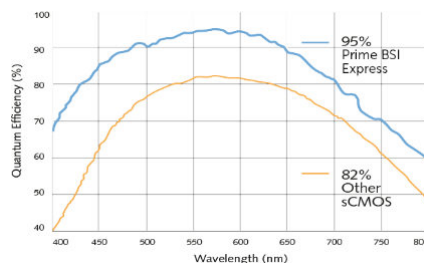
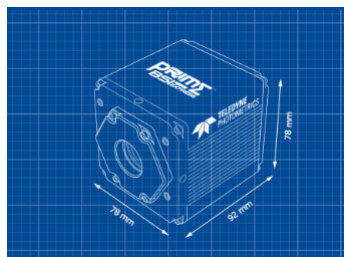
[Click here](#) to learn more about the Prime 95B!

# Product Overview: Prime BSI Express



The Prime BSI Express Scientific CMOS (sCMOS) is designed on a compact platform optimized for integration and delivers the perfect balance between high resolution imaging and sensitivity with an optimized pixel design, USB 3.2 Gen 2 connectivity and near perfect 95% Quantum Efficiency to maximize signal detection.

- **95% Quantum Efficiency**
- **1.0e- Read Noise**
- **6.5  $\mu\text{m}$  x 6.5  $\mu\text{m}$  Pixel Area**
- **95 Frames Per Second over USB 3.2 Gen 2**



## Compact Form Factor

The Prime BSI Express is a compact 78mm x 78mm x 90mm with optimized cooling for the size, ideal for integration into new or existing configurations.

## Sensitivity

By bringing the light in from the back of the sensor, photons land directly onto the light receiving surface, maximizing light collecting capability.

The Prime BSI Express combines 95% quantum efficiency with the low 1.0 e-read noise CMS mode to deliver the most sensitive camera based on sCMOS technology at over 40 frames per second.

## Resolution and Pixel Size

The Prime BSI Express features 6.5  $\mu\text{m}$  pixels, the accepted standard for most live cell applications.

This pixel size provides highly detailed images across the imaging plane and is most suitable for the broadest range of magnifications.

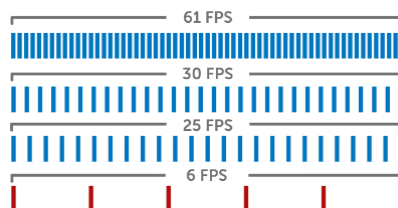
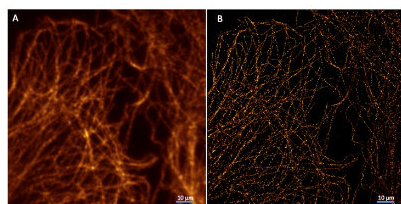
[Click here](#) to learn more about the Prime BSI Express!

# Product Overview: Evolve EMCCD

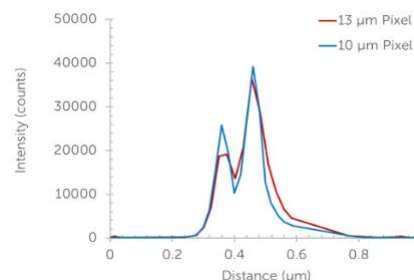
## evolve<sup>®</sup>

The Evolve<sup>®</sup> is a high-resolution, back-illuminated EMCCD providing high sensitivity for the lowest light applications. With proprietary Teledyne technology throughout, the Evolve provides a new standard in EMCCD performance and reliability.

- >95% quantum efficiency
- 10, 13 and 16  $\mu\text{m}$  pixel size options
- Ultra-high-speed readout
- Highly stabilized deep cooling
- Featuring Teledyne EMCCD technology



Resolution Comparison: 10  $\mu\text{m}$  vs 13  $\mu\text{m}$  Pixel



## Superior Signal to Noise for Faint Signals

When you can count your photons on one hand, you need the lowest noise possible. Alongside back-illumination for maximum quantum efficiency, the Evolve series uses Electron Multiplication to achieve a read noise as low as 0.25e<sup>-</sup> without sacrificing frame rate.

## Frame Rate Flexibility

Full-frame imaging rates of up to 61 fps can be sustained in high speed readout mode, with frame rates greater than 4,000fps available when imaging with regions of interest.

## Pixel Size Options To Match Your Optics

Pixel size choice is a balance of resolution and sensitivity – larger pixel areas collect more photons. The Evolve range includes 13 and 16  $\mu\text{m}$  pixel cameras to provide optimum sensitivity. However, resolution was previously limited for EMCCDs due to a lack of smaller pixel size options.

Now with sensor manufacture taking place in-house, Teledyne is able to offer a 10  $\mu\text{m}$  pixel back-illuminated EMCCD, matching the required pixel size for 100x oil immersion microscope objectives.

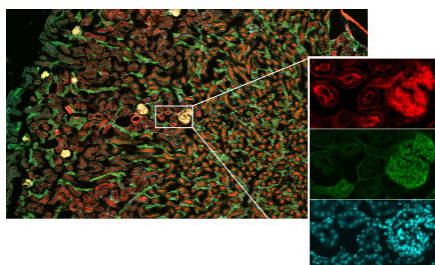
[Click here](#) to learn more about the Evolve Series!

# Product Overview: Iris Family



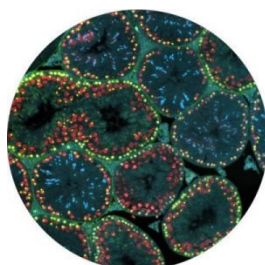
The Iris 15 Scientific CMOS (sCMOS) camera provides a very large field of view and the highest resolution with its 15 Megapixel design. The Iris 9 provides the same resolution benefits but for a wider range of microscopes.

- 15 or 9 Megapixel Camera
- 4.25  $\mu\text{m}$  x 4.25  $\mu\text{m}$  Pixel Area
- Large 25 mm Diagonal Field of View



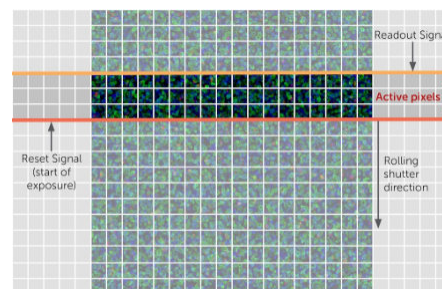
## Large Field of View

The larger format 25 mm sensor of the Iris 15 is designed to increase throughput, maximize the amount of data captured and take full advantage of new, larger field of view microscopes.



## High Resolution

The small, 4.25  $\mu\text{m}$  pixels provide highly detailed images across the imaging plane, which allows for the highest resolution when using lower magnification objectives.



## Advanced Triggering

Programmable Scan Mode provides increased control over the rolling shutter exposure and read-out functionality of CMOS sensors by providing access to the sensor timing settings to allow optimization around applications that require control over the line time.

[Click here](#) to learn more about the Iris Family!

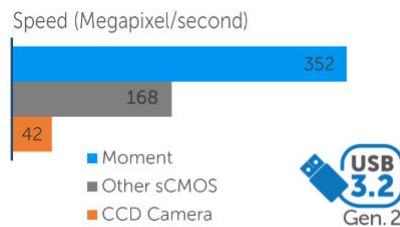
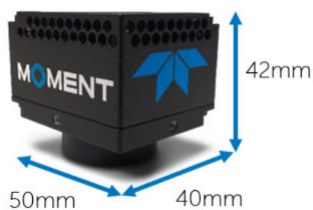
# Product Overview: Moment

## MOMENT

Capture the Moment with this ultra-compact, 7 Megapixel CMOS camera. This camera uses a true global shutter, freezing moving objects in time. With both data and power over a single USB3.2 Gen 2 cable, the Moment is optimized for easy integration, and capturing a 17.5 mm sensor diagonal at 50 frames per second, the Moment shows you exactly what's happening.



- 7 Megapixel
- 50fps over USB3.2 Gen 2
- Global Shutter
- Low Noise
- 73% QE



### Ultra-compact Form Factor

Measuring just 50mm x 40mm x 42 mm, the Moment can fit into virtually any instrument. Over 3 times smaller than other sCMOS devices on the market, the Moment can fit easily into existing instruments, or minimize the footprint of your new device.

### Speed and Simplicity

The Moment utilizes the simple, versatile and high-speed USB 3.2 Gen 2 – 10 GBit/s interface to deliver 50fps full frame. What's more, both data and power are provided by the same cable, simplifying integration.

### Global Shutter Snapshot

Global shutter minimizes complexity of illumination control, simplifying your imaging setup. Collect all the light that comes your way without the dead time, artefacts and synchronization issues of a rolling shutter device..

[Click here](#) to learn more about the Moment CMOS!

# About Teledyne Photometrics

## World-Leaders in Scientific CMOS & EMCCD

Teledyne Photometrics is **the established leader in the global scientific community** for high performance CMOS, CCD and EMCCD cameras that support demanding, quantitative bio-research. The original architect of the first scientific-grade EMCCD, Photometrics maintained its leadership role with the Prime 95B, the first Scientific CMOS camera with 95% QE for the highest sensitivity available. In 2020, Teledyne Photometrics launched **the Kinetix, which redefines scientific CMOS performance capability with an unmatched combination of speed, sensitivity, and field of view.**

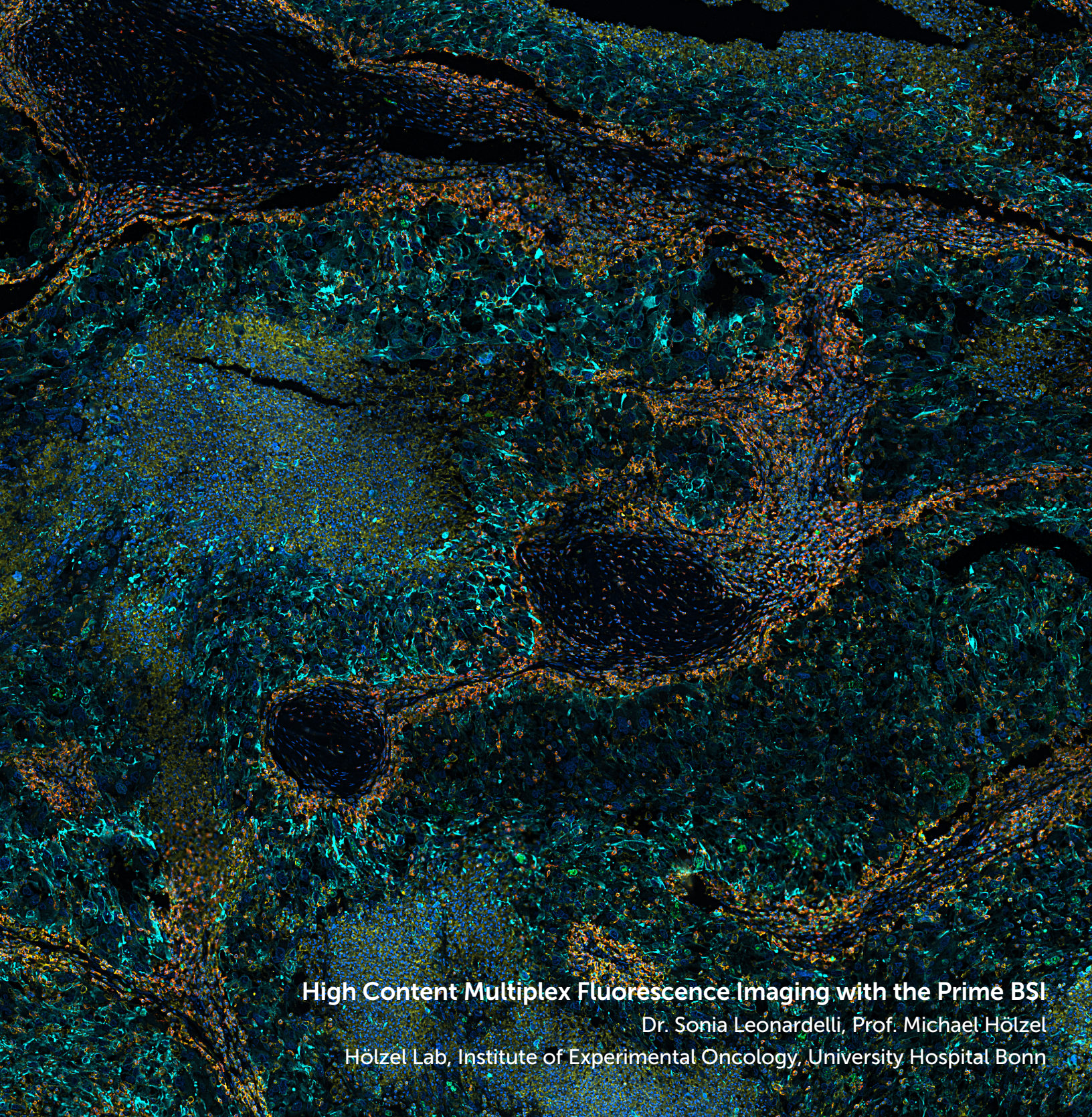
Teledyne Photometrics also offers a **comprehensive OEM program** that enables customers to integrate cameras in a wide variety of configurations, from complete, ready-to-run camera systems to component level, single-board cameras. A dedicated team ensures rapid integration with software, optical, electrical and mechanical elements.

Founded in 1978, Teledyne Photometrics is headquartered in Tucson, Arizona in the US and is a registered ISO 9001:2008 company. Teledyne Photometrics has been a part of the Teledyne Imaging Group since 2019.

## Part of the Teledyne Imaging Group

Teledyne Imaging is a group of leading-edge companies aligned under the Teledyne umbrella. Teledyne Imaging forms an unrivalled collective of expertise across the spectrum and decades of experience. Individually, each company offers best-in-class solutions. Together, they combine and leverage each other's strengths to provide the deepest, widest imaging and related technology portfolio in the world. From aerospace through industrial inspection, radiography and radiotherapy, geospatial surveying, and advanced MEMS and semiconductor solutions, Teledyne Imaging offers world-wide customer support and the technical expertise to handle the toughest tasks. Their tools, technologies, and vision solutions are built to deliver to their customers a unique and competitive advantage.





**High Content Multiplex Fluorescence Imaging with the Prime BSI**

Dr. Sonia Leonardelli, Prof. Michael Hötzl

Hötzl Lab, Institute of Experimental Oncology, University Hospital Bonn



**TELEDYNE IMAGING**  
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