



Product comparison:

JENOPTIK GRYPHAX® RIGEL vs. ProgRes® MFcool

GRYPHAX® RIGEL



Explore the micro universe
monochrome in low light.

The **premium solution**
for low light research microscope applications

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JENOPTIK GRYPHAX® – comparison

All camera comparisons are based on results of our JENOPTIK digital image laboratory. The quality of our cameras is proven by spectral measurement at our laboratory and is based on guidelines of EMVA 1288 standard.

Comparison of JENOPTIK GRYPHAX® RIGEL



Refine every microscope workstation

JENOPTIK GRYPHAX® RIGEL replaces all monochrome research CCD cameras.

JENOPTIK GRYPHAX® RIGEL is the **premium solution** for low light research microscope applications. It is powered by a **1/1.2" back-illuminated CMOS sensor made by SONY**.

This camera provides fast live images, with **global shutter** technology, **high dynamic range** and **non-visible noise**. Reach up to **120 fps** in full sensor resolution combined with the brilliant Jenoptik image quality. **Collect information beyond visible light**.

Within this comparison we take a look at the ProgRes® MFcool compared to JENOPTIK GRYPHAX® RIGEL, the successor of all monochrome research ProgRes® CCD cameras.

Sensor/Camera	ProgRes® MFcool with clear glass filter	JENOPTIK GRYPHAX® RIGEL with clear glass filter
Utilized sensor diagonal	10,9 mm	13,3 mm
FPS	13 (1360 x 1024)	120 (1920 x 1200)
Quantum Efficiency [N(e-)/N(p)] @ 532nm (green)	0.54 QE(λ) see spectral data	0.66 QE(λ) see spectral data
Dark Noise [DN/e-]	7 DN (at 14 bit); 9e-	0.8 DN (at 12 bit); 6e-
Dynamic Range (DR)	66 dB	73 dB

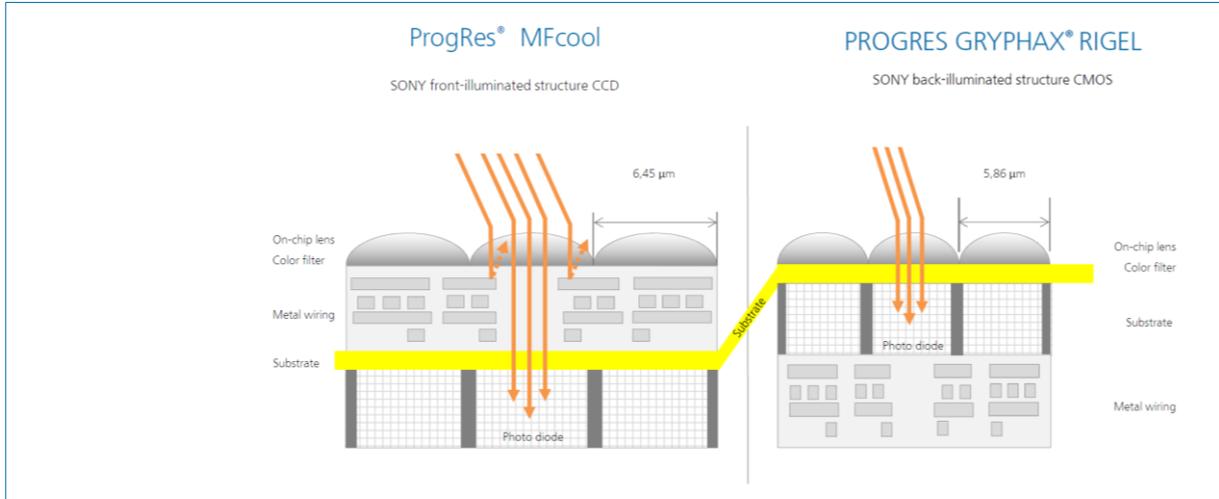
By reason on our measurements, done within our laboratory and based on guidelines of EMVA 1288.

Sensor



JENOPTIK GRYPHAX® RIGEL

is equipped with SONY's **back-illuminated CMOS** sensor technology.

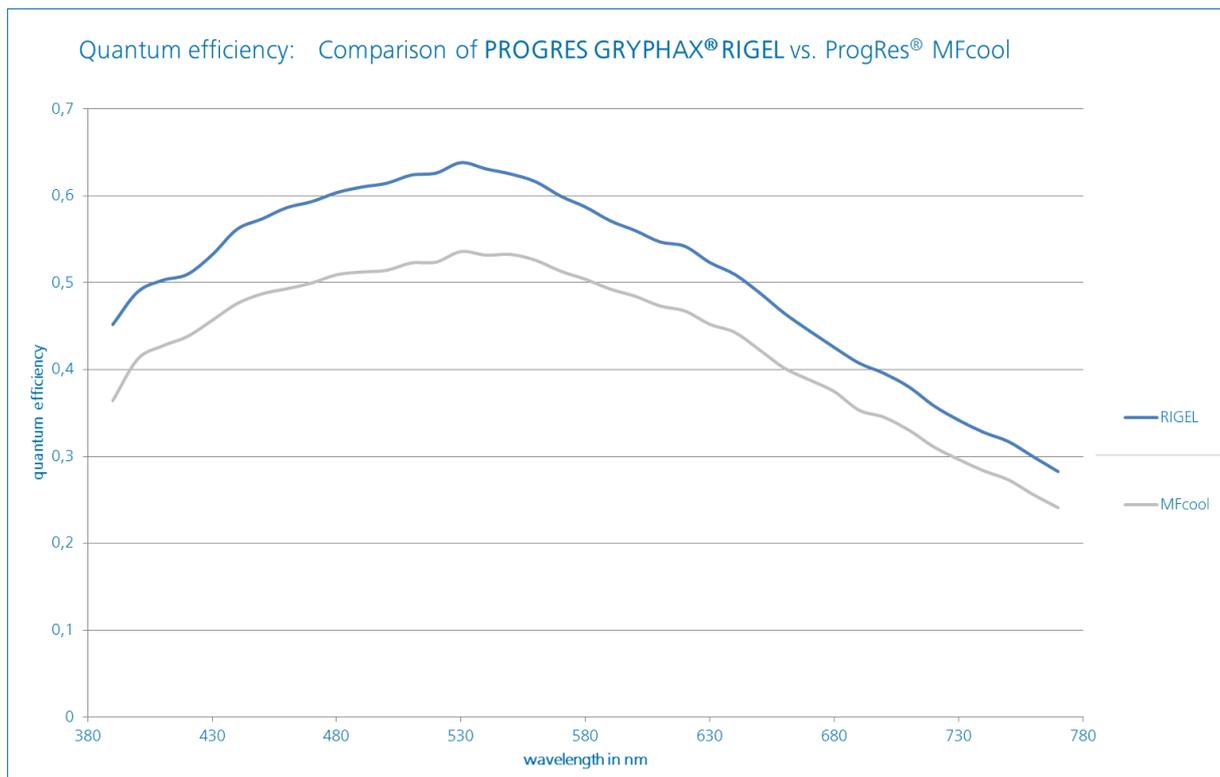


Source: Graphic done by Jenoptik based on information from www.sony.net

With a conventional front-illumination structure, the metal wiring and transistors on the surface of the silicon substrate that form the sensor's light-sensitive area (photo-diode) impede photon gathering carried out by the on-chip lens, and this has also been an important issue in the miniaturization of pixels and widening optical angle response. A back-illuminated structure minimizes the degradation of sensitivity to optical angle response, while also increasing the amount of light that enters each pixel due to the lack of obstacles such as metal wiring and transistors that have been moved to the reverse of the silicon substrate. However, compared to conventional front-illuminated structures, back-illuminated structures commonly causes problems such as noise, dark current, defective pixels and color mixture that lead to image degradation and also cause a decrease in the signal-to-noise ratio. To overcome this Sony has developed a unique photo-diode structure and on-chip lens optimized for back-illuminated structures, that achieves a higher sensitivity and a lower random noise without light by reducing noise, dark current and defect pixels compared to the conventional front-illuminated structure. Additionally, Sony's advanced technologies such as high-precision alignment have addressed any color mixture problems.

Source: information from www.sony.net

Quantum efficiency with clear glass





JENOPTIK GRYPHAX® RIGEL's quantum efficiency is more than **20 percent higher** (at 532 nm) than ProgRes® MFcool

Camera cooling



JENOPTIK GRYPHAX® RIGEL has a unique vibration-free software cooling developed by JENOPTIK.

The so-called **software cooling** is a camera individual calibration for temperature correction to deliver best noise level to the images.

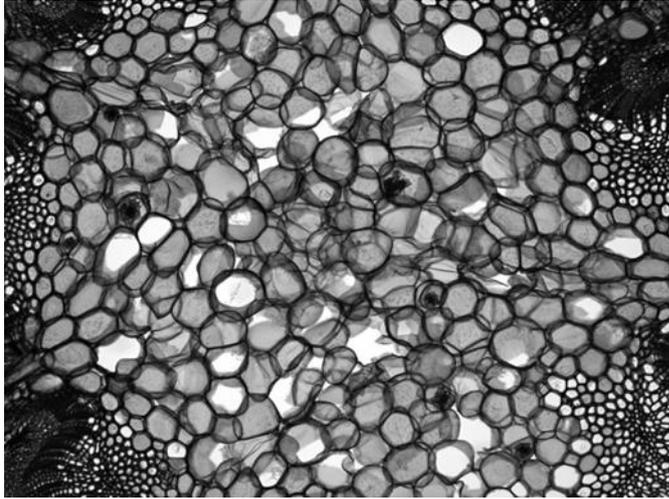
JENOPTIK GRYPHAX® RIGEL advantages:

- ☆ **Effective** photon to electron transformation
- ☆ No interlace effect & no smear
- ☆ **Low dark noise** and **low dark current**
- ☆ **Cooling** - Unique vibration-free software cooling developed by JENOPTIK*
- ☆ **High live & video frame rate**
- ☆ High input clock frequency
- ☆ **High dynamic range**
- ☆ **Secure investment:** long-lasting & reliable hardware

Sensor size and basic TV-adapter 1,0

ProgRes® MFcool

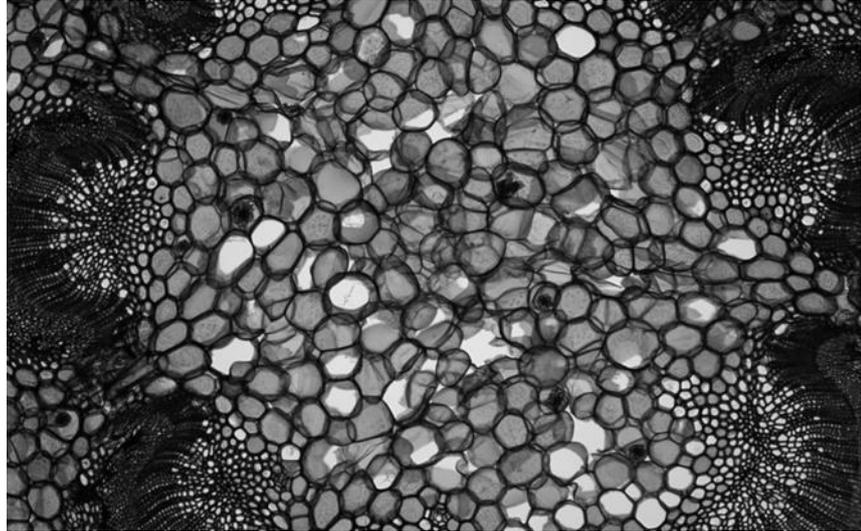
CCD 2/3"



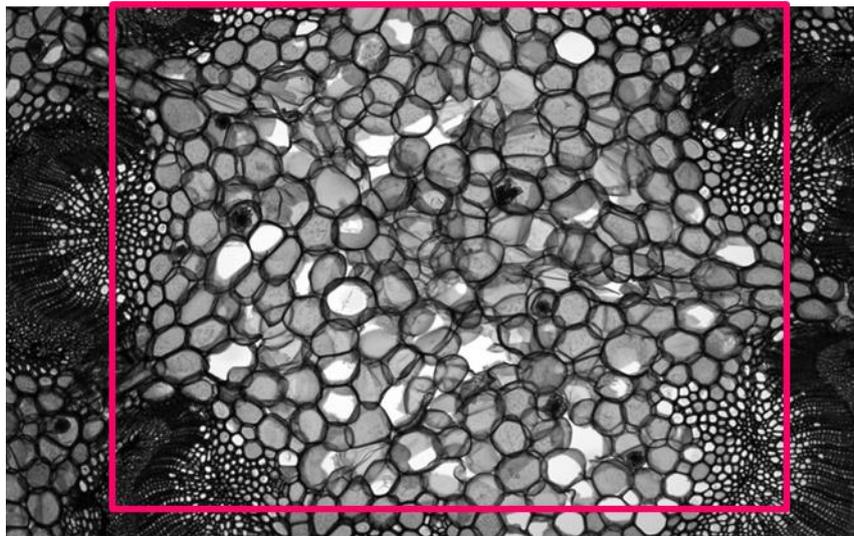
TV-Adaption Zeiss 1,0x (60N-C 1")

JENOPTIK GRYPHAX® RIGEL

CMOS 1/1.2"



TV-Adaption Zeiss 1,0x (60N-C 1")

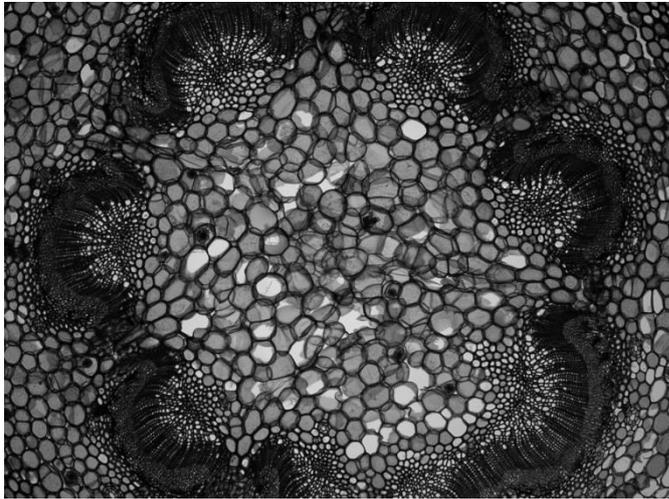


Equipment:	Microscope	Zeiss AxioScope.A1
	Lens	Zeiss 5x EC-Eiplan-NEOFLUAR
Sample:	Hedera Helix (Gemeiner Efeu) Blattstiel quer "1037"	

Sensor size and best fitting TV-adapter 0,63

ProgRes® MFcool

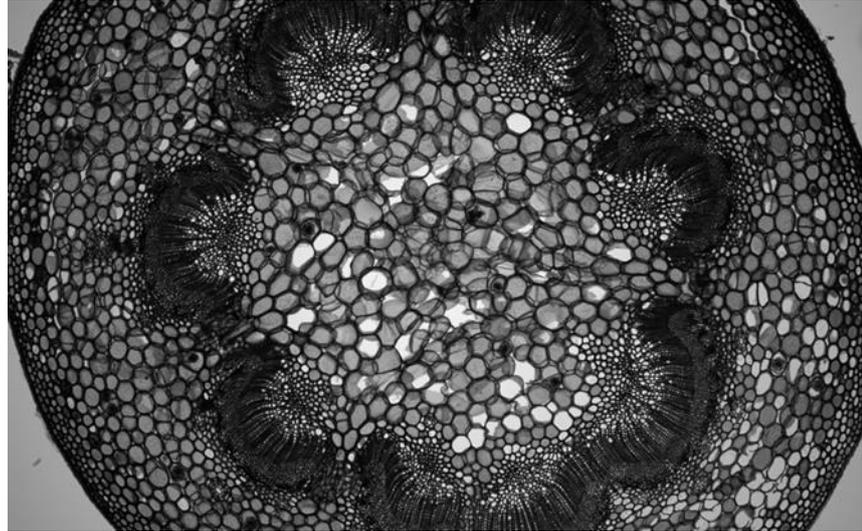
CCD 2/3"



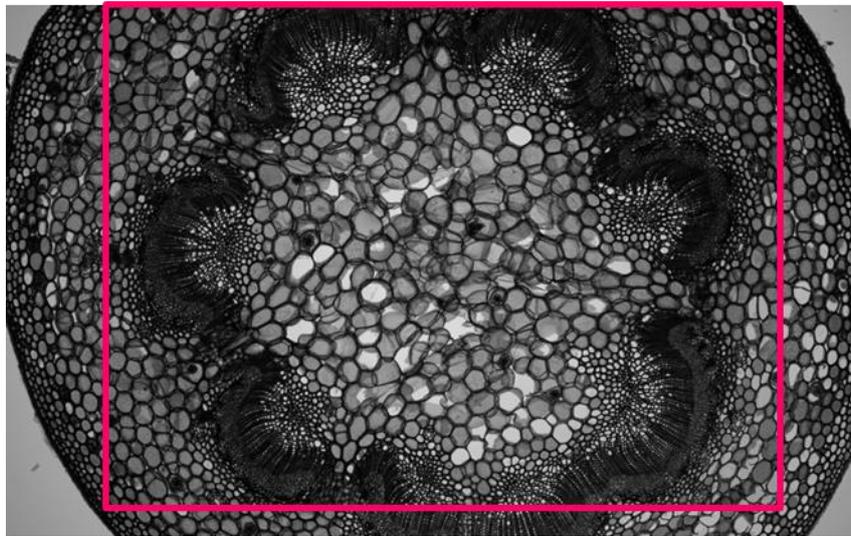
TV-Adaption Zeiss 0,63x (60N-C 2/3")

JENOPTIK GRYPHAX® RIGEL

CMOS 1/1.2"



TV-Adaption Zeiss 0,63x (60N-C 2/3")



Equipment:	Microscope	Zeiss AxioScope.A1
	Lens	Zeiss 5x EC-Eiplan-NEOFLUAR
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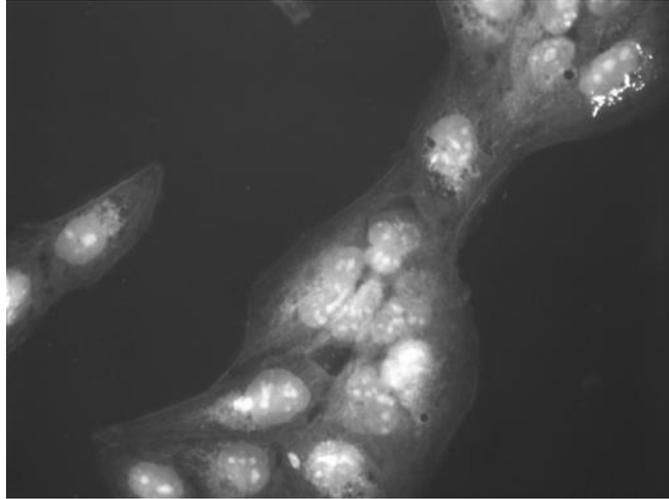
JENOPTIK GRYPHAX® RIGEL has a more than **37 % larger** sensor field than ProgRes® MFcool

JENOPTIK GRYPHAX® RIGEL **advantages:**

- ☆ Microscopy-**optimized** field of view
- ☆ Cost-**efficient** TV adaption 1x are suitable

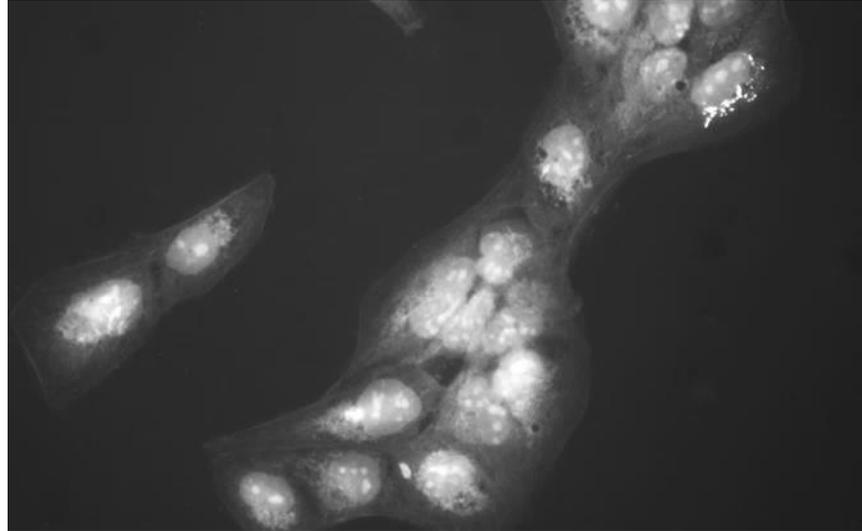
Fluorescence

ProgRes® MFcool
CCD 2/3"



TV-Adaption Zeiss 1,0x (60-C 1")

JENOPTIK GRYPHAX® RIGEL
CMOS 1/1.2"



TV-Adaption Zeiss 1,0x (60-C 1")

Equipment: Microscope Zeiss AxioScope 40

Lens Zeiss Plan-NEOFLUAR 40x

Sample: Bovine pulmonary artery endothelia (BPAE)



JENOPTIK GRYPHAX® RIGEL provides the same sensitivity with a back illuminated CMOS sensor. Fast live images are possible with increased gain because of the very low dark noise.

JENOPTIK GRYPHAX® RIGEL **advantages:**

- ☆ Using increased Gain to get a fast live image for easy focusing
- ☆ Cooling - Unique vibration-free software cooling developed by JENOPTIK*

Live image



JENOPTIK GRYPHAX® RIGEL is equipped with an **all pixel scan** and **global shutter** sensor. It provides up to **120 fps at 2.3 MPix** live image speed, perfect for video recording and **slow-motion** record.

This is **more than 9 times faster** compared to MFcool frame rate!

Main features of JENOPTIK GRYPHAX software take advantage of the modern camera characteristics.

Video / Slow motion record

JENOPTIK GRYPHAX® RIGEL advantages:

- ☆ Video speed at live image: “You get what you see”
- ☆ Video recording of living or to be moved specimen at brilliant image quality, without interlace effect.

EDF / Z-stacking

JENOPTIK GRYPHAX® RIGEL advantage:

- ☆ Real-time appearance of EDF/ Z-stacking images (no interlace effect, no distorted images) saves time.

Panorama

JENOPTIK GRYPHAX® RIGEL advantage:

- ☆ Real-time appearance of panorama (no interlace effect, no distorted images) saves time.

Captured Image

JENOPTIK GRYPHAX® RIGEL advantage:

- ☆ This camera provides 60 % more resolution and therefore more details.

Software



JENOPTIK GRYPHAX software is workflow optimized capture software. It is created to help users intuitive getting the perfect live and captured image and saving time.

JENOPTIK GRYPHAX® Software advantage:

- ☆ Cross-platform compatible **WIN, MAC** and **LINUX**
- ☆ **Identical GUI** across WIN, MAC and LINUX platform
- ☆ **Versatility:** Free SDK, wide range of 3rd party software support
- ☆ **Drivers for:** µManager, Twain, MetaMorph and DirectX support included
- ☆ **Stability:** Made in Germany, software updates free of charge

Weight and dimension

ProgRes® MFcool	JENOPTIK GRYPHAX® RIGEL
Weight: ~ 800 gr	Weight: ~ 400 gr
Dimension:: L x W x H in mm 89 x 84 x 93	Dimension: L x W x H in mm 85 x 75 x 50,2

JENOPTIK GRYPHAX® Packaging advantage:

- ☆ Lower transport costs due to less weight and dimension of housing and camera packaging.

Applications and contrast techniques

JENOPTIK GRYPHAX® RIGEL recommended Applications

- **Life & Medical Science**
- Education Life & Medical Science
- **Material & Manufacturing**
- Education Material & Manufacturing
- **Fluorescence**
- Education Fluorescence

JENOPTIK GRYPHAX® RIGEL recommended contrast techniques

- **BF – Bright-Field**
- **DF – Dark-Field**
- **DIC – Differential-Interference-Contrast**
- **Ph – Phase contrast**
- **Pol - Polarization**

JENOPTIK GRYPHAX® RIGEL is the superior solution for monochrome fluorescence applications.

Summary

JENOPTIK GRYPHAX® RIGEL advantages at a glance:

- ☆ **Effective** photon to electron transformation
- ☆ No interlace effect & no smear
- ☆ **Low dark noise** and **low dark current**
- ☆ **High dynamic** range
- ☆ **Cooling** - Unique vibration-free software cooling developed by JENOPTIK*
- ☆ High input clock frequency
- ☆ **High live & video frame rate**
- ☆ **Slow-motion** record
- ☆ **Secure investment:** long-lasting & reliable hardware
- ☆ **37% larger** field of view
- ☆ Microscopy-**optimized** field of view
- ☆ Cost-**efficient** TV adaption 1x are suitable
- ☆ Using **increased** Gain to get a fast live image for easy focusing
- ☆ Video speed at live image: “You get what you see”
- ☆ Real-time appearance of **EDF/ Z-stacking** images saves time
- ☆ Real-time appearance of **panorama** saves time
- ☆ Cross-platform compatible **WIN, MAC** and **LINUX**
- ☆ **Identical GUI** across WIN, MAC and LINUX platform
- ☆ **Versatility:** Free SDK, wide range of 3rd party software support
- ☆ **Drivers for:** µManager, Twain, MetaMorph and DirectX support included
- ☆ **Stability:** Made in Germany, software updates free of charge
- ☆ Low transport costs due to less weight and dimension

*unique vibration-free software cooling developed by JENOPTIK (further information gryphax@jenoptik.com)



Refine every microscope workstation with
JENOPTIK GRYPHAX® RIGEL

The **premium solution** for low light research microscope applications

Also take a look on our [new product portfolio JENOPTIK GRYPHAX®!](#)

GRYPHAX® RIGEL

Explore the micro universe
monochrome in low light.



The **premium solution**
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