DECTRIS
detecting the future

Welcome to the DECTRIS Lunchtime Seminar!

DECTRIS Ltd.
5405 Baden-Dättwil
Switzerland
www.dectris.com

Compact and versatile Hybrid Photon Counting detector



PILATUS3 100K-M

Four product variants

- *Laboratory and Synchrotron (R & X)*
- *Silicon & CdTe sensors*
- *versatile platform for Specific Solutions*

Detector Electronics Unit (DEU)



Detector Head

Lightweight and compact detector head

- *Weight 0.9 kg*
- *Dimensions (WHD): 114 x 69 x 118 mm^3*

Vacuum compatibility (optional)

- *down to 10^{-6} mbar*

Cable length between head and DEU: 2 meters

- *plus spare data cable*

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Products for electron diffraction

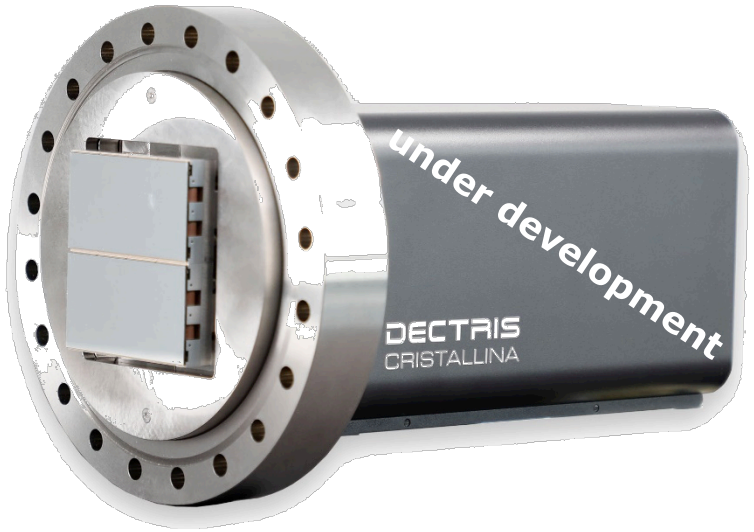
Great for microED of small molecules and proteins

QUADRO and CRISTALLINA bring tangible benefits:
- *Speed, dynamic range, sensitivity, radiation hardness.*

QUADRO



CRISTALLINA 1M




Angewandte International Edition Chemie
GDCh A Journal of the German Chemical Society

Communication

Rapid structure determination of microcrystalline molecular compounds using electron diffraction

Tim Gruene, Julian T. C. Wennmacher, Christian Zaubitzer, Julian J. Holstein, Jonas Heidler, Ariane Fecteau-Lefebvre, Sacha De Carlo, Elisabeth Müller, Kenneth N. Goldie, ... See all authors

First published: 16 October 2018 | https://doi.org/10.1002/anie.201811318


nature

NEWS · 29 OCTOBER 2018

'Why didn't we think to do this earlier?' Chemists thrilled by speedy atomic structures

Cross-disciplinary thinking was key to realizing the potential of electron diffraction to organic chemistry.


ANALYTICAL CHEMISTRY

Small Molecule Structures: A New World

By Derek Lowe | 18 October, 2018

Word has been spreading rapidly about this preprint on Chemrxiv.org, from a joint UCLA/Caltech team. It details the use of the cryo-electron microscopy technique called micro-electron diffraction (MicroED) for the structure determination of small molecules, and it's absolutely startling. I read it last night, with many exclamations along the way, not all of them fit for print (and that's in a good way). And it turns out that basically simultaneously, a Swiss/German collaboration has published on the same technique, one day before.

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What we do

DECTRIS develops and manufactures the most advanced X-ray and electron detectors to spark scientific, analytical and medical breakthroughs around the world.



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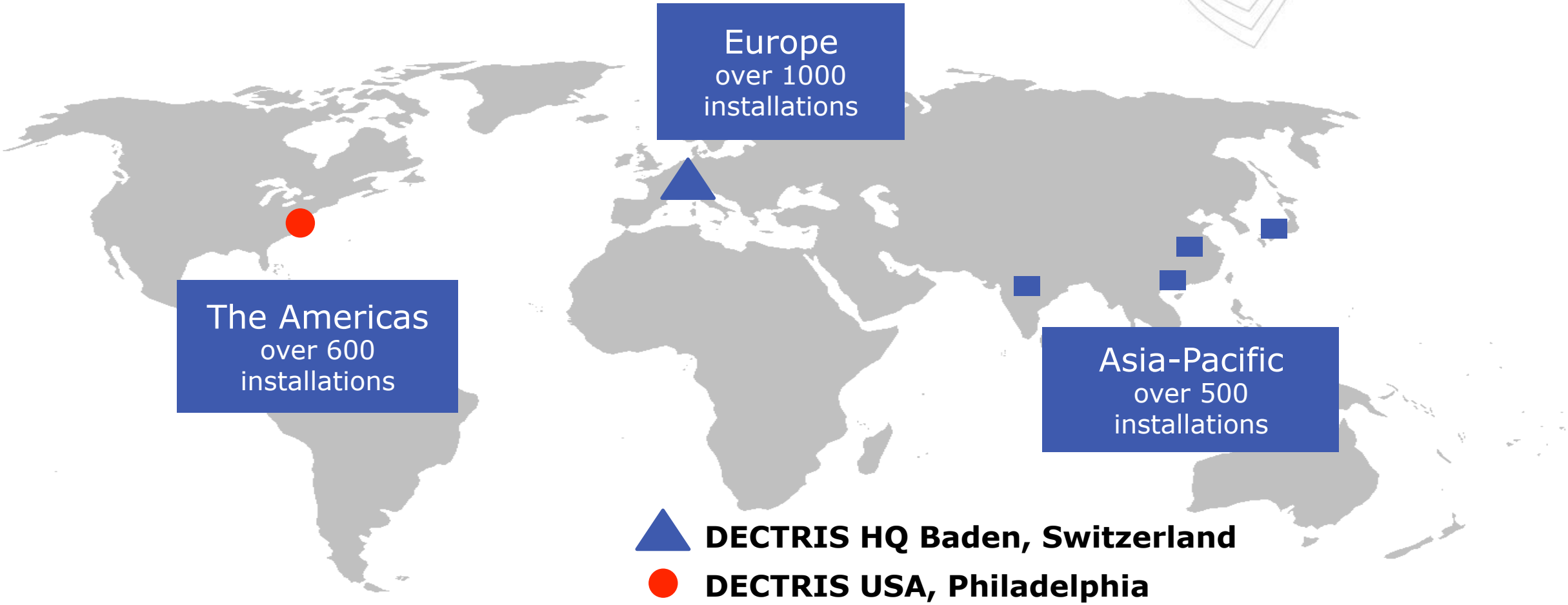
DECTRIS – more than 10 years in detection

- More than 110 employees
- Development and production at same location
- Over 2000 detectors delivered



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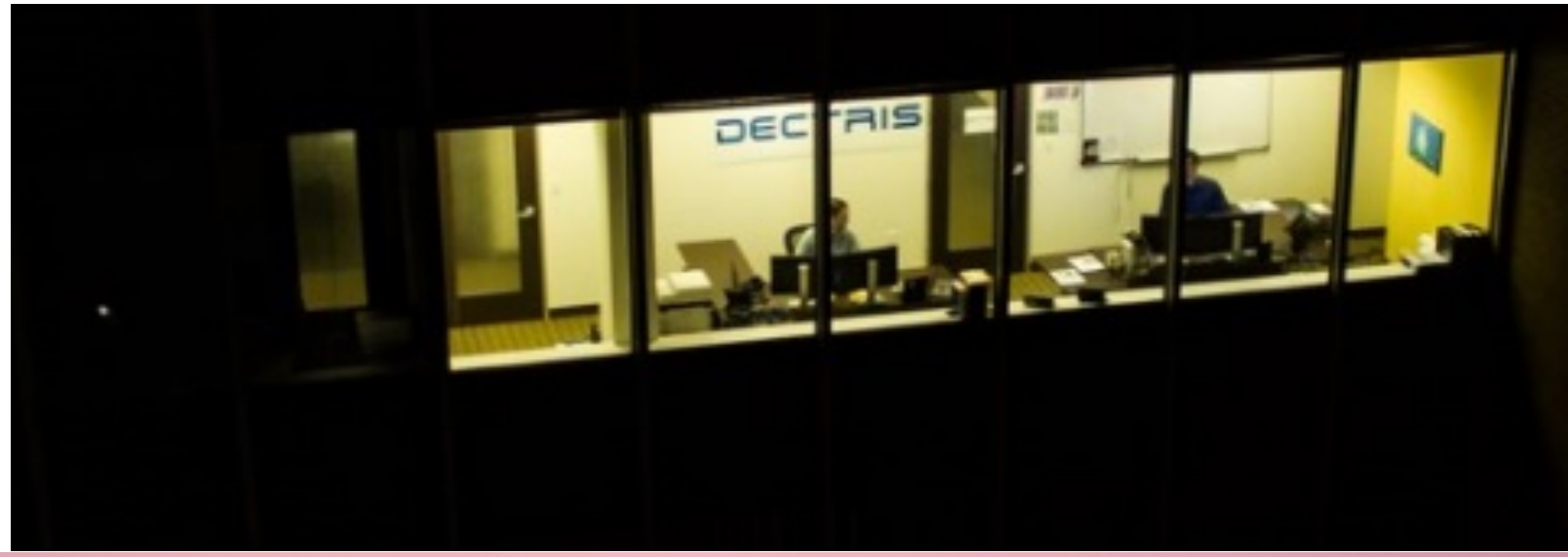
Serving customers worldwide

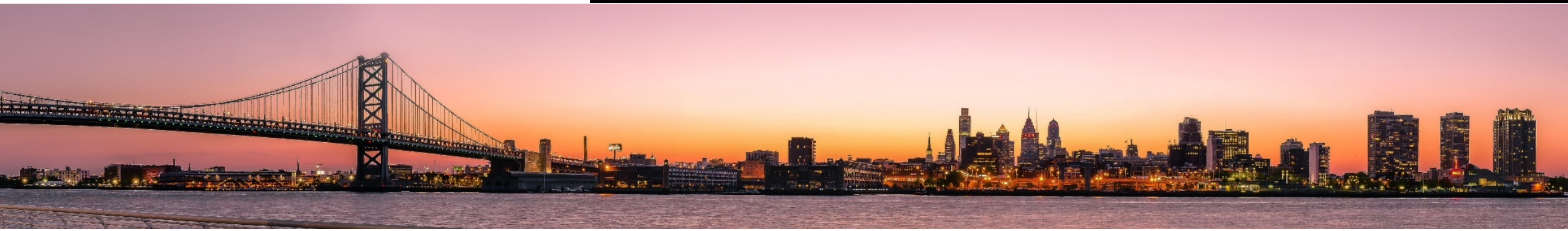


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DECTRIS USA Inc

- Central Philadelphia
- Established 2017
- 3 employees (and expanding)
- Office & Lab





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DECTRIS USA – to your advantage

Customer Support

- Detector Engineers in US-time zone
- Short and easy travel if required
- Laboratory and spare parts in US

Sales

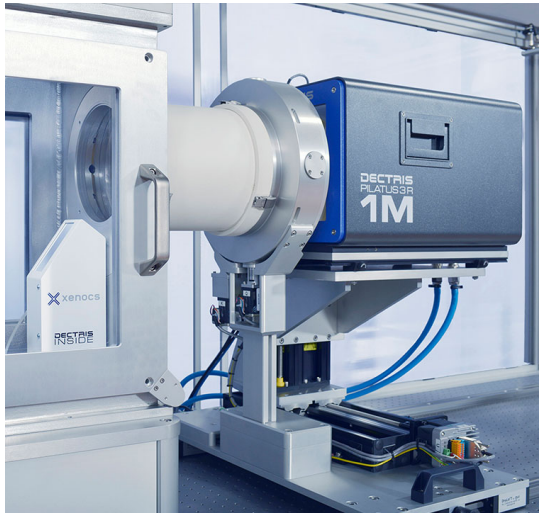
- Purchase from US company
- No import and customs
- Offers in USD

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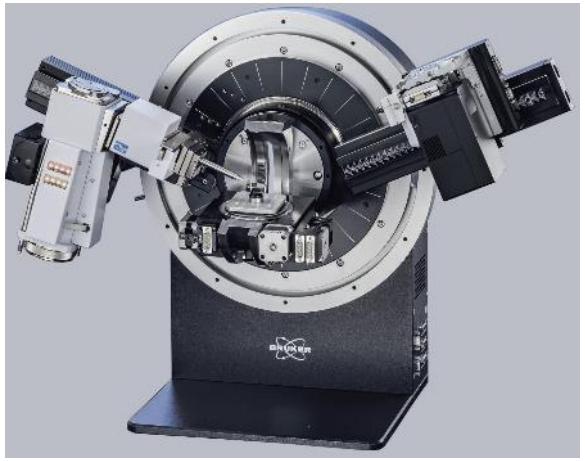
Laboratory applications X-ray

DECTRIS provides technologically leading detectors for X-ray diffraction and scattering in laboratory and industry applications.

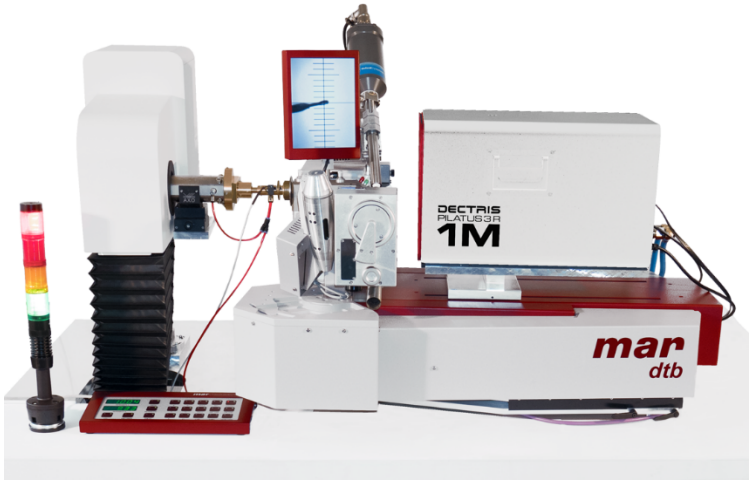
Small-angle X-ray scattering



Powder X-ray diffraction



Single crystal diffraction



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Laboratory applications X-ray

DECTRIS – your OEM partner

BRUKER

Anton Paar

Rigaku oxford diffraction

STOE SINCE 1887

PROTO MANUFACTURING

xenocs Exploring the very small

HUBER Diffraction and Positioning Equipment

marXperts

For our customers, we are the best partner for superior X-ray detectors.

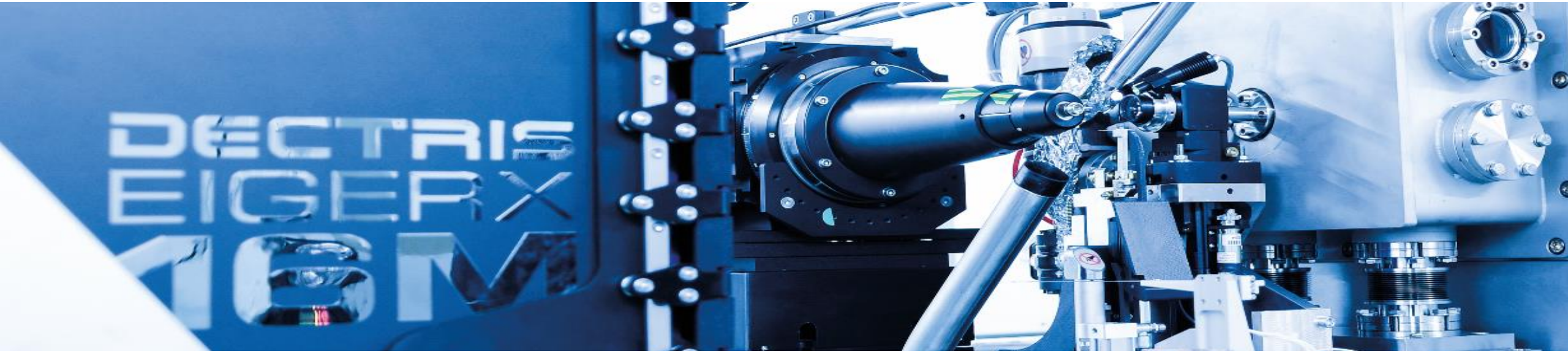
To this end, we are

- *Technology leader*
- *Professional development partner*
- *Reliable supplier*

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Enabling scientific discoveries

Hybrid Photon Counting (HPC) has transformed X-ray detection at synchrotrons.

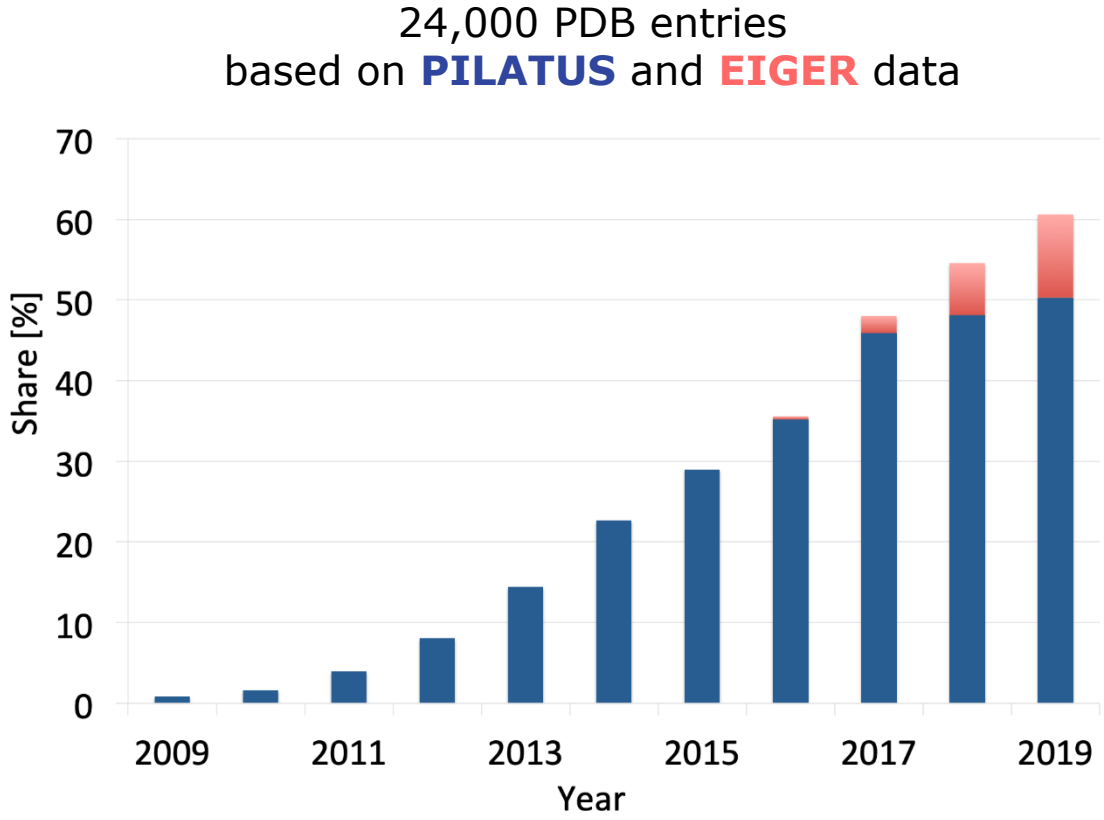


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Boosting cutting-edge crystallography

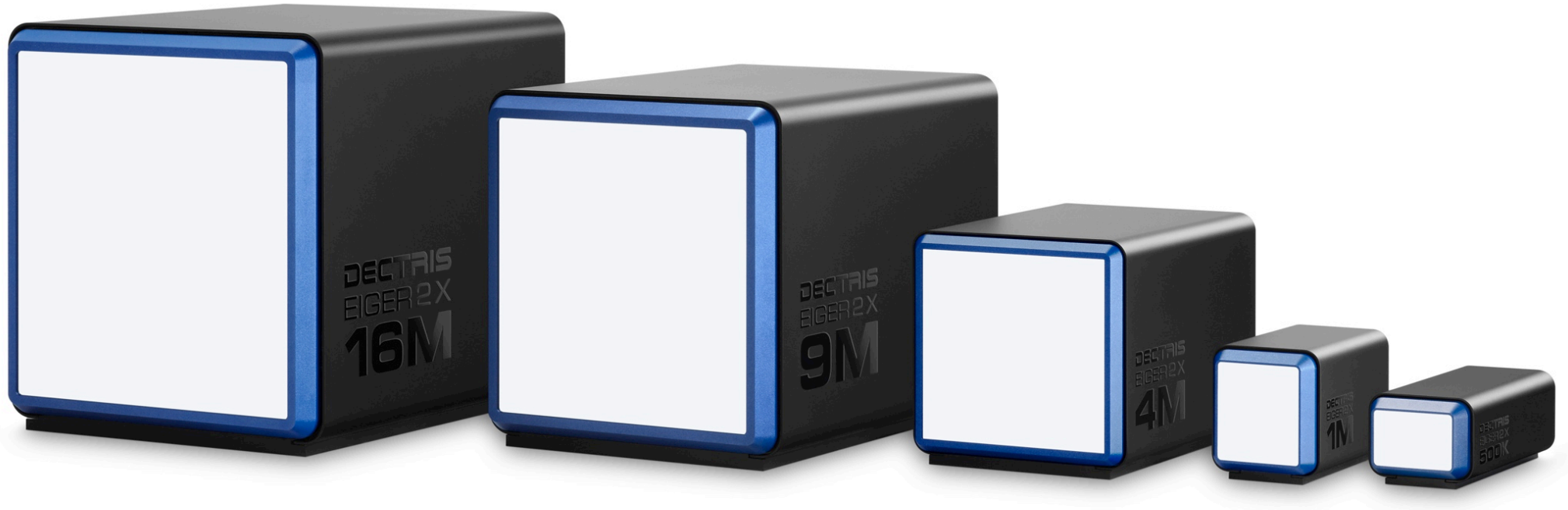
The right detector for your application

- *MX at long wavelengths.*
- *MX at high energies.*
- *Charge density studies.*
- *Chemical crystallography.*
- *Serial crystallography.*
- *Pink-beam crystallography.*
- *Crystallography at RT.*



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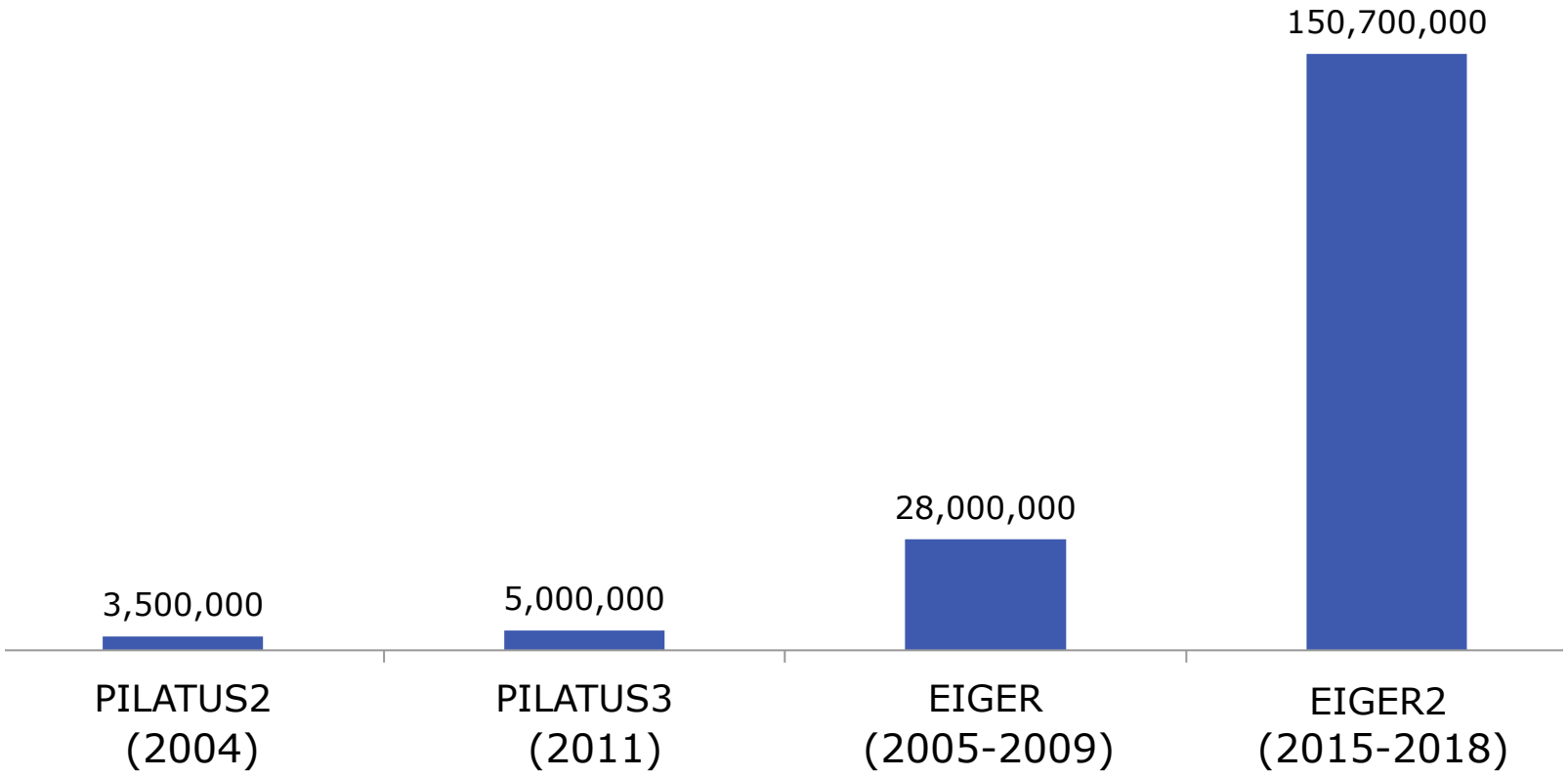
EIGER2 X detector series



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The new DECTRIS EIGER2 ASIC

Increased complexity for higher performance



Number of transistors per ASIC

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With EIGER2 you can do more

Main advantages

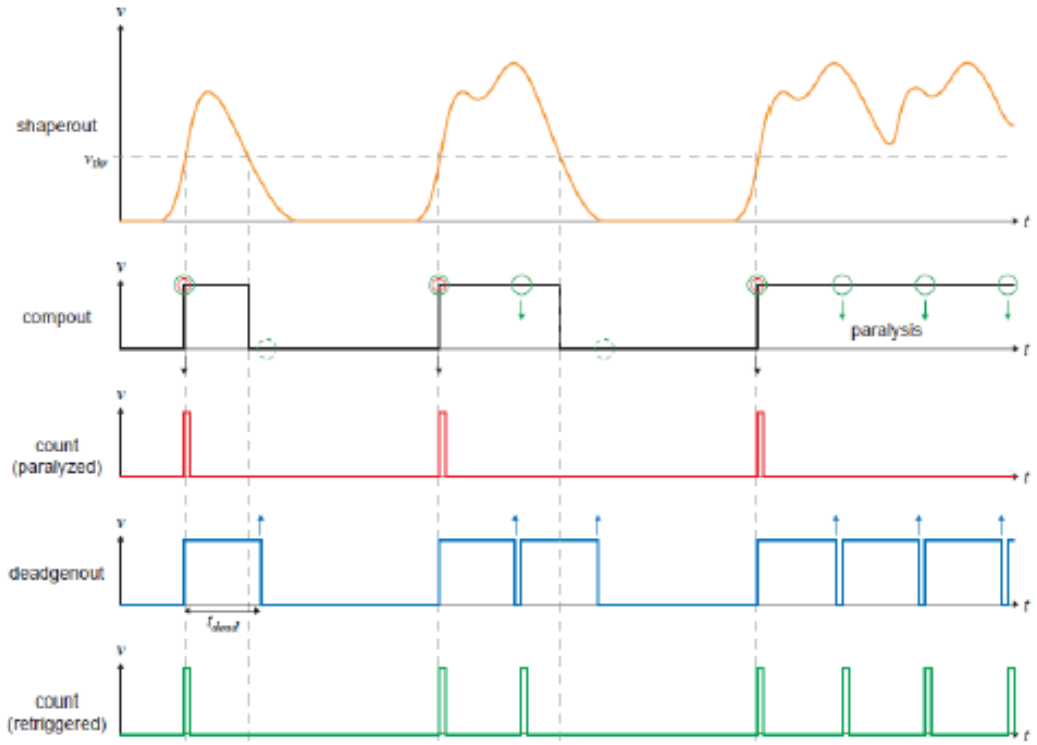
- *Count rate capability 10^7 counts/s/pixel through non-paralyzable Hybrid Photon Counting (HPC) technology.*
- *Suppression of fluorescence and high-energy photons with two energy discriminating thresholds.*
- *Dead time free data collection with dual 16-bit counters.*
- *Pump & probe capability through gateable detection.*

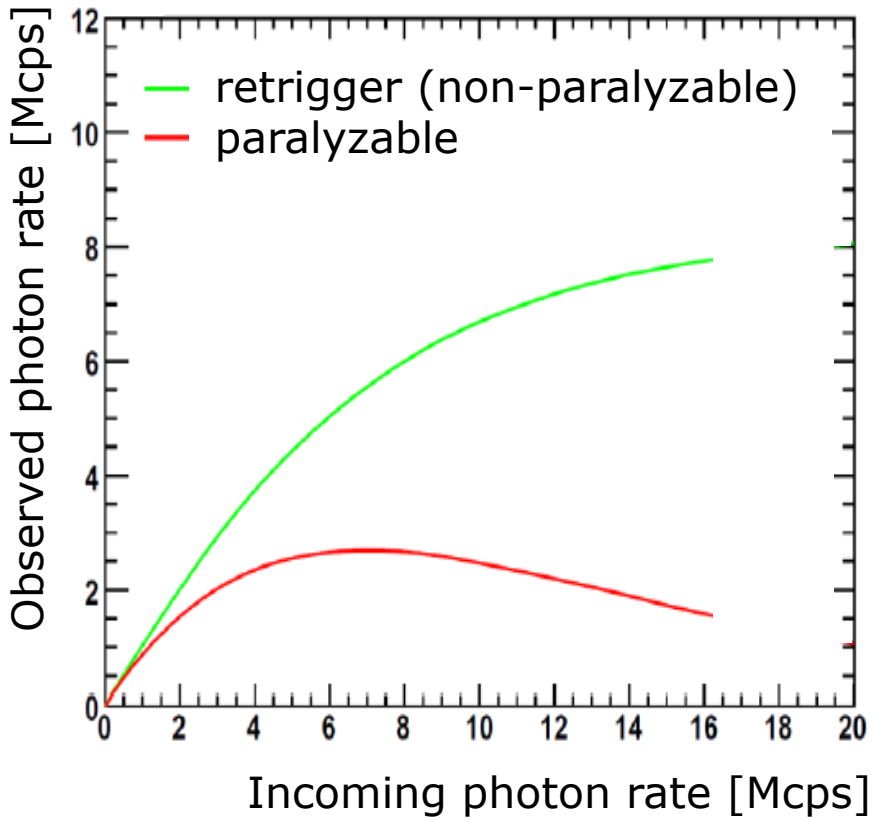


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Instant Retrigger for EIGER2

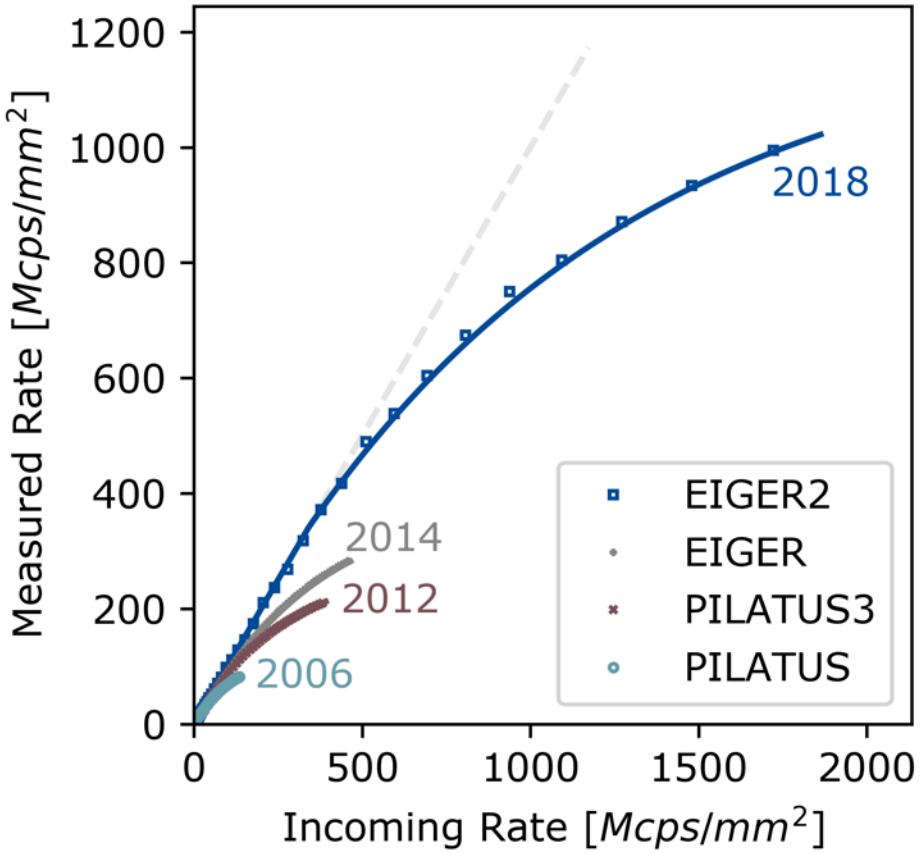
Photon counting without ambiguity





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Count Rate Comparison



EIGER2 X count rate capability

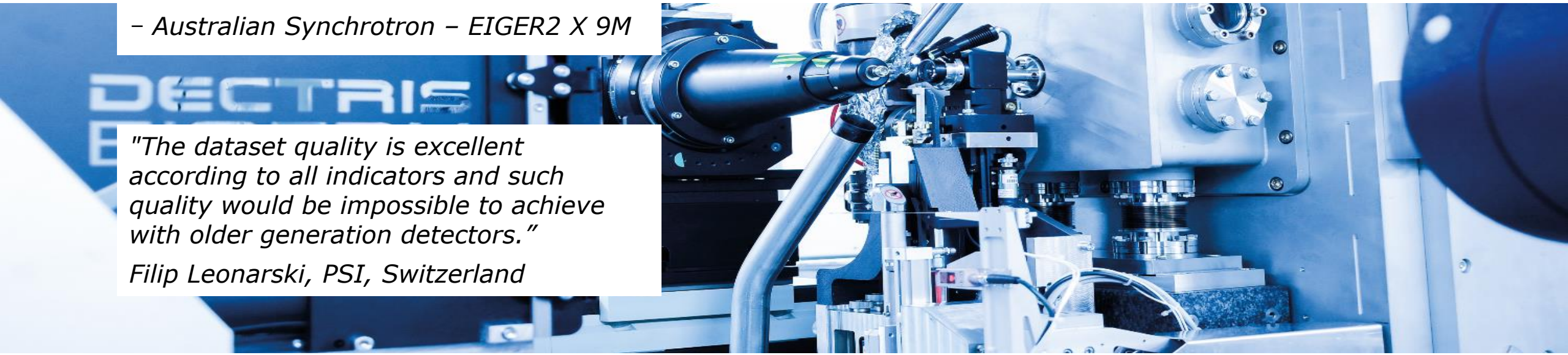
- *2 billion counts per second and mm².*
- *25-fold increase since PILATUS.*

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First systems are operational

Systems installed at

- *Swiss Light Source – EIGER2 X 16M*
- *Diamond Light Source – 2x EIGER2 X 16M, EIGER2 X 4M*
- *Australian Synchrotron – EIGER2 X 9M*



"The dataset quality is excellent according to all indicators and such quality would be impossible to achieve with older generation detectors."

Filip Leonarski, PSI, Switzerland

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Is EIGER2 better than EIGER?

The external dimensions of EIGER2 systems are unchanged from EIGER

	EIGER X 16M	**EIGER2 X 16M**
Pixel size [μm^2]	75 x 75	75 x 75
Maximum count rate [photons/s/pixel]	2.4 x 10^6	10^7
Point spread function	1 pixel	1 pixel
Readout time	3 µs dead time	two counters – no dead time
Energy discriminating thresholds	1	2
Maximum frame rate [Hz]	133	130

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EIGER2 XE

Large EIGER2 X detectors with up to 550 Hz



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Specifications

	EIGER2 XE 9M	EIGER2 XE 16M
Pixel size [μm^2]	75 x 75	75 x 75
Maximum count rate [photons/s/mm^2]	10^7	10^7
Maximum frame rate [Hz]	**550**	**550***, 400

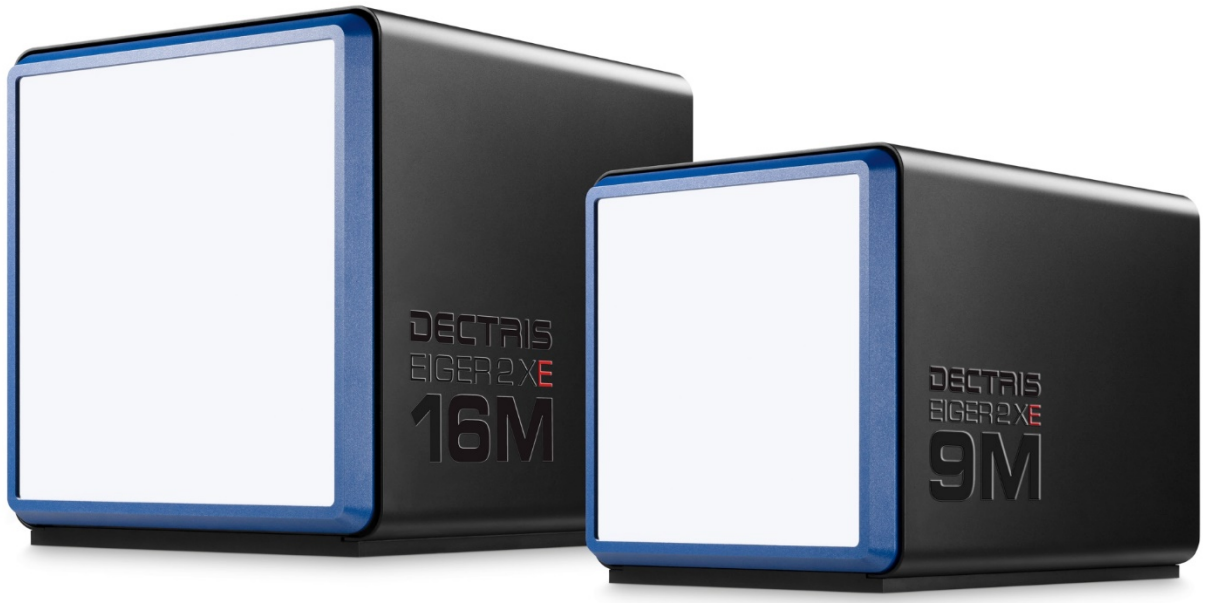
* For up to 10,000 images

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EIGER2 XE detectors available now

Get your quote now.

For updates – sign up to our newsletter.



Newsletter

Sign up in DECTRIS E-Mail Newsletter for news, events, upgrades and special offers.

We assure, that we do not share your personal information with others.

*Company**

*First name**

*Last name**

*Email**

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Meet us at ACA 2019



Talk

– *Wednesday, 1:30 pm*
"Adding new dimensions to in situ and operando experiments"

Poster

– *Tomorrow, 5:30 pm*
"The death of powder – micro-electron diffraction with EIGER"

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Thank you for your attention !



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