IGNITING QUESTIONS

DETECTING ANSWERS

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qCMOS – the dawn of a new era

GEN II sCMOS
1.4e- rms

ORCA-Flash 4.0 V2

ORCA-Flash 4.0 V3

GEN III sCMOS
0.7e- rms

ORCA-Fusion

ORCA-Fusion BT

qCMOS
0.27e- rms

qCMOS

BACK ILLUMINATED CMOS TECHNOLOGIES

LOW NOISE TECHNOLOGIES

2011 / 2016 / 2018 / 2020 / 2021...

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"Scientists have become the bearers of the torch of discovery in our quest for knowledge."

STEPHEN HAWKING

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Introducing the new qCMOS

ORCA-Quest

"Light is possibility itself."

TERUO HIRUMA
PHOTONICS VISIONARY AND FORMER PRESIDENT OF HAMAMATSU PHOTONICS

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Introducing the new qCMOS

ORCA-Quest

- Photon number resolving mode
- Unprecedented performance
- Ultimate low light detector

LOW READOUT NOISE

0.27 ELECTRONS RMS

ULTRA-QUIET SCAN

HIGH QE

90% @475 nm

BACK-ILLUMINATED qCMOS

HIGH RESOLUTION

4096 × 2304

9.4 MEGAPIXELS

HIGH SPEED

120 FRAMES/S

@4096 x 2304 PIXELS (16 BIT) standard scan

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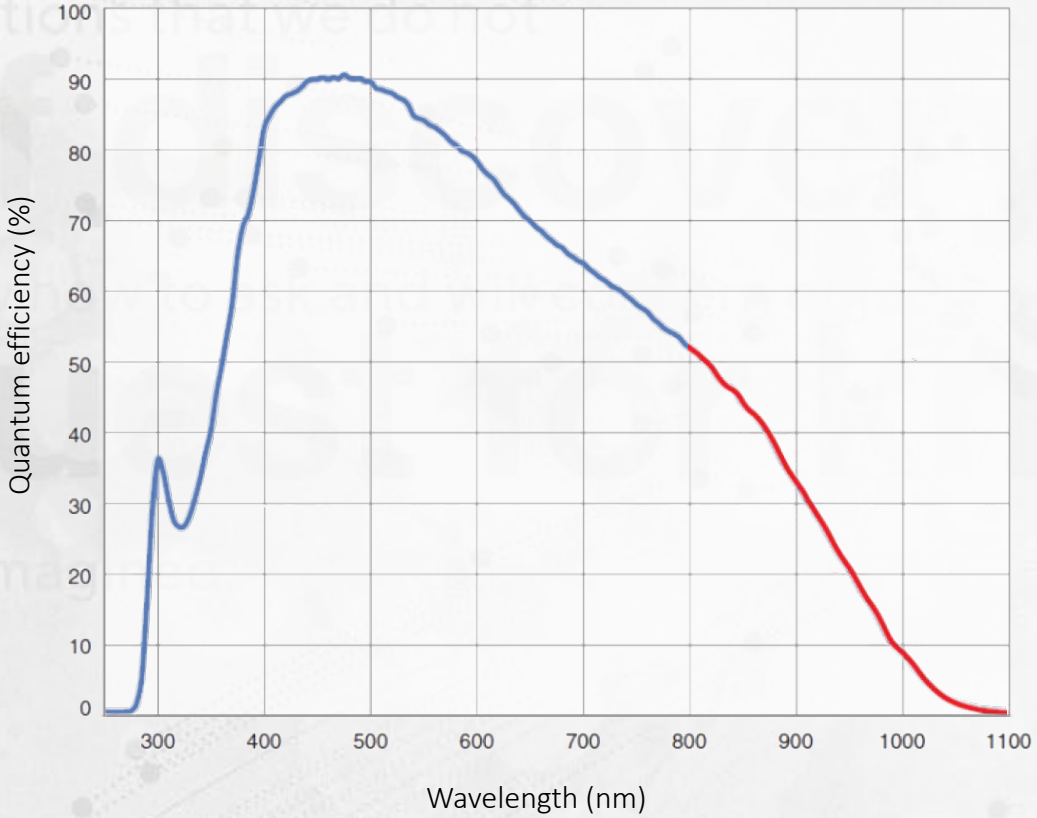
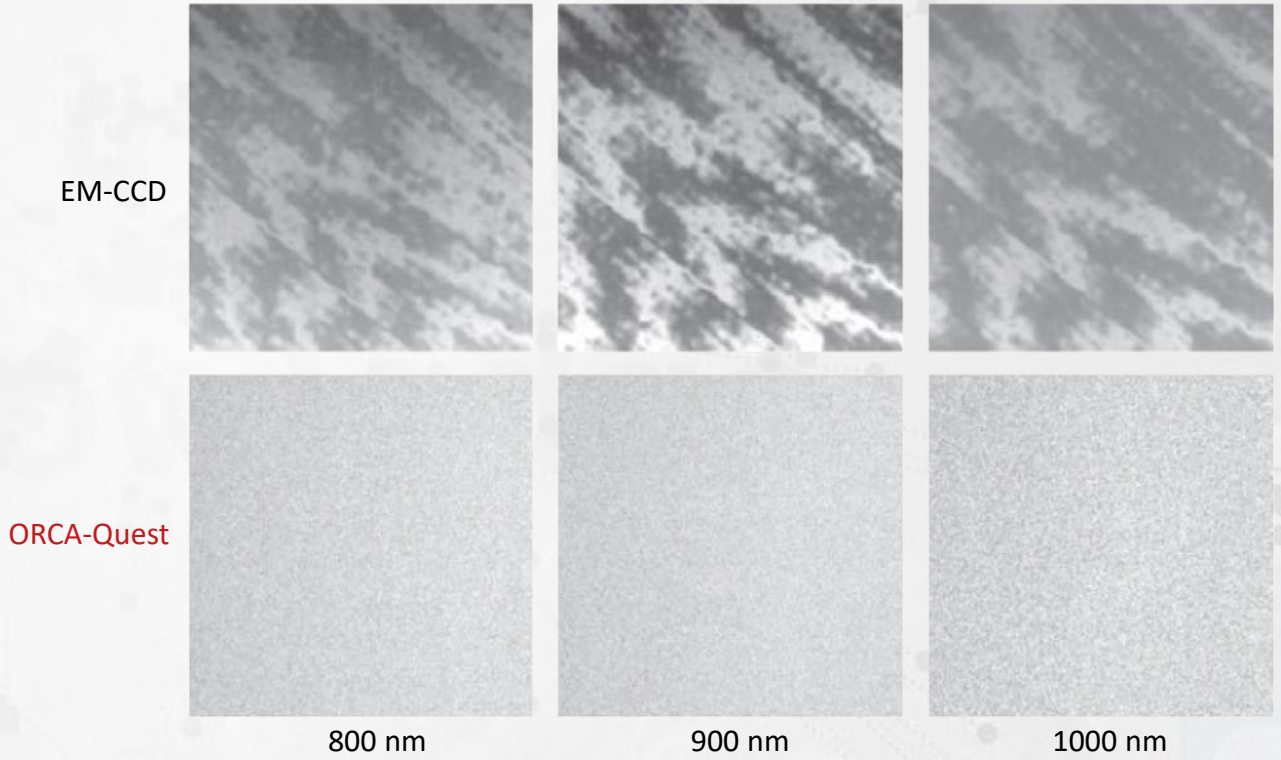
Introducing the **ORCA-Quest.**

High QE up to 90% @475nm and 33% @900nm



Minimal Etaloning effect



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Introducing the **ORCA-Quest.**

High speed imaging @ 120 fps full frame

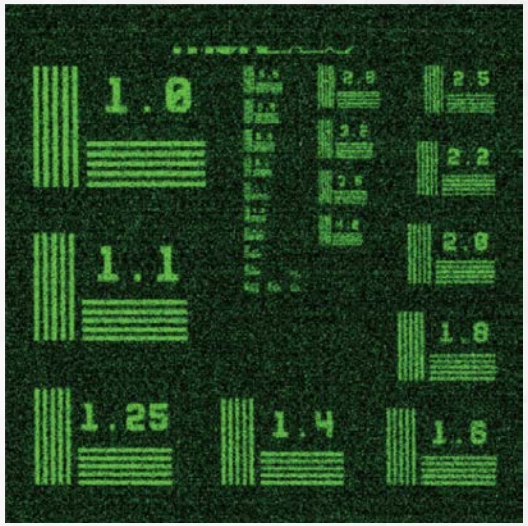
532 fps (with 512x512 sub array)

Low dark current of 0.006 e-/p/s

Long exposure time up to 30 mins

READOUT MODE		AREA READOUT MODE		
Scan mode		Standard scan		Ultra-quiet mode
X (pixels)	Y (pixels)	CoaXPress	USB 3.1 Gen I (16 bit)	CoaXPress and USB 3.1 Gen I (16 bit)
4096	2304	120	17.6	5.00
4096	2048	134	19.9	5.62
4096	1024	268	39.6	11.1
4096	512	532	78.9	22.1
4096	256	1044	156	43.5
4096	128	2012	304	83.8
4096	8	15 432	2893	643
4096	4	19 841	4084	826

ORCA-Quest



Gen II sCMOS camera

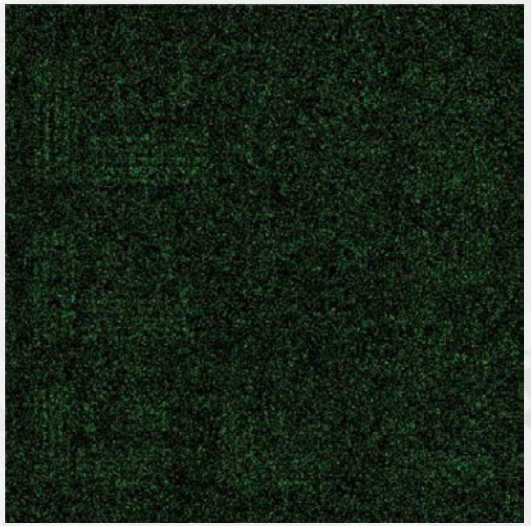


Image quality comparison at long exposure time (pseudo-color)
Incident light intensity: 0.05 photons/pixel/s. Exposure time: 15 min (10 s x 90 times integration)

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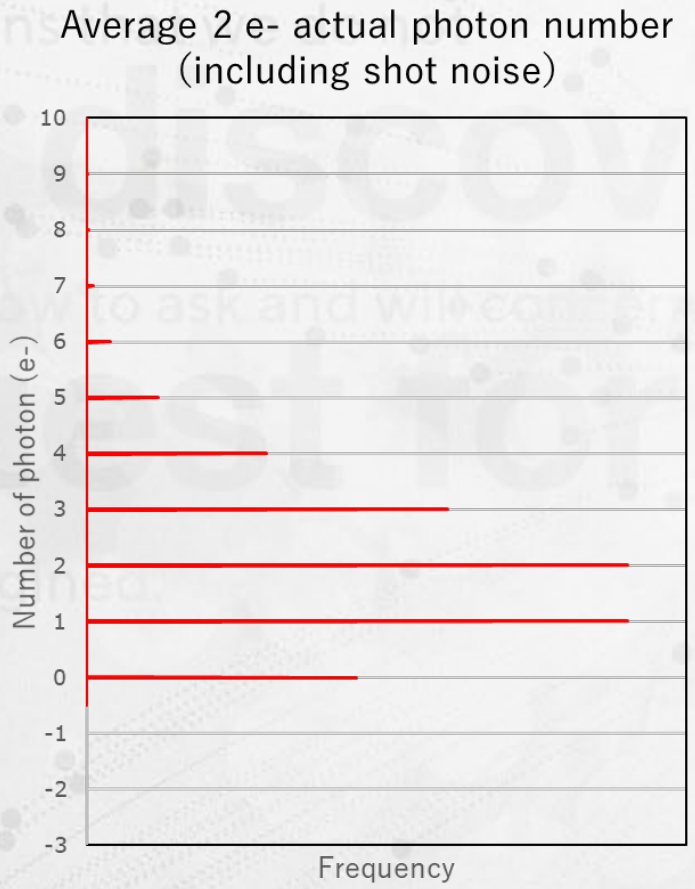
Introducing the **ORCA-Quest.**

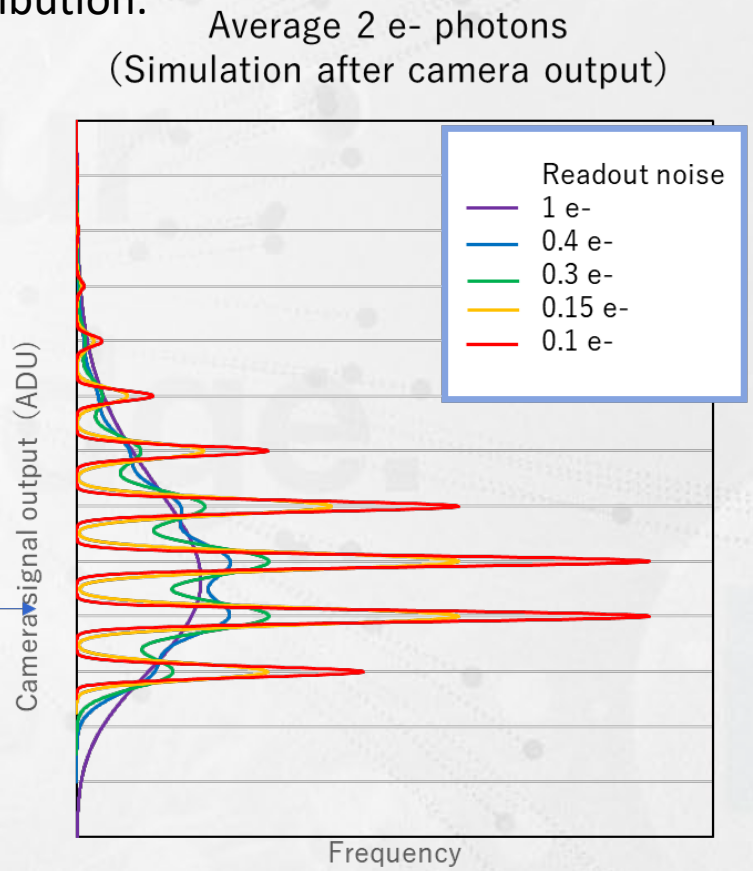
The optical shot noise follows a Poisson distribution

Reducing the readout noise to absolute minimum allow photon number detection, following the Poisson distribution.



It follows a Poisson distribution like this

As the readout noise decreases, the output signal gradually becomes more discrete.



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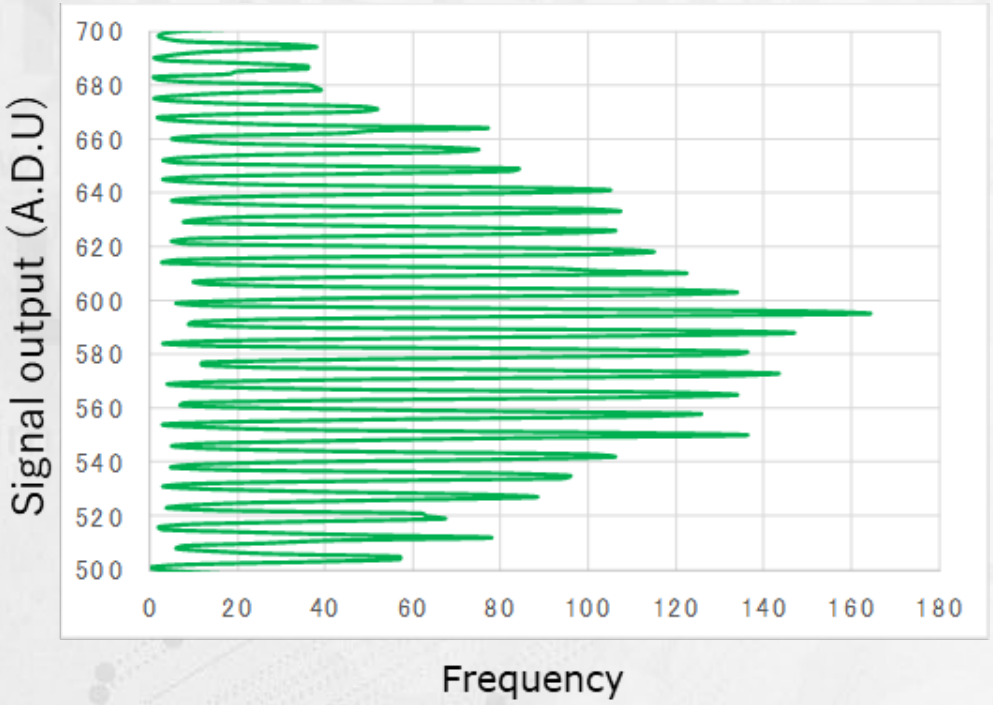
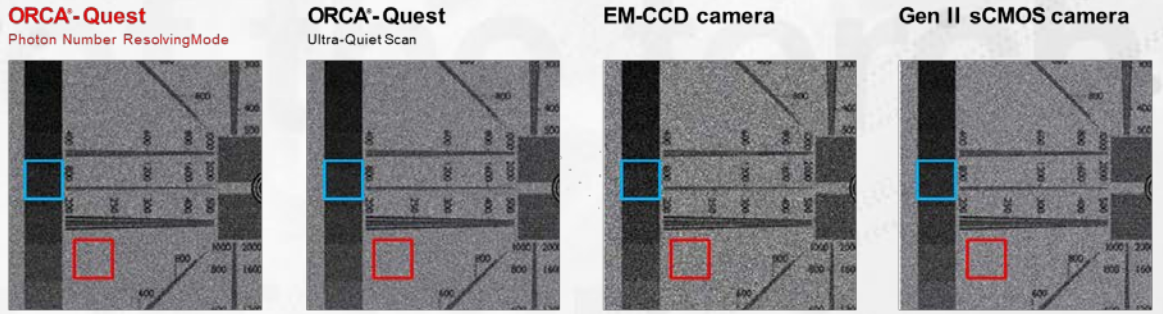
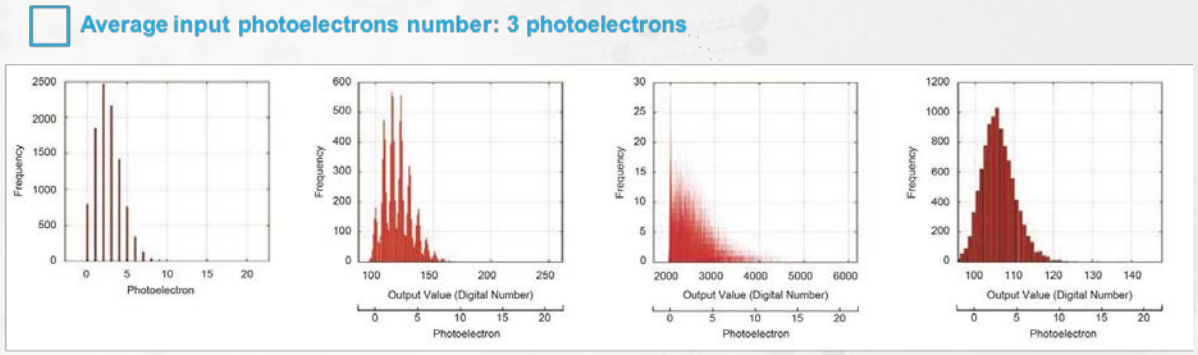
Introducing the **ORCA-Quest.**

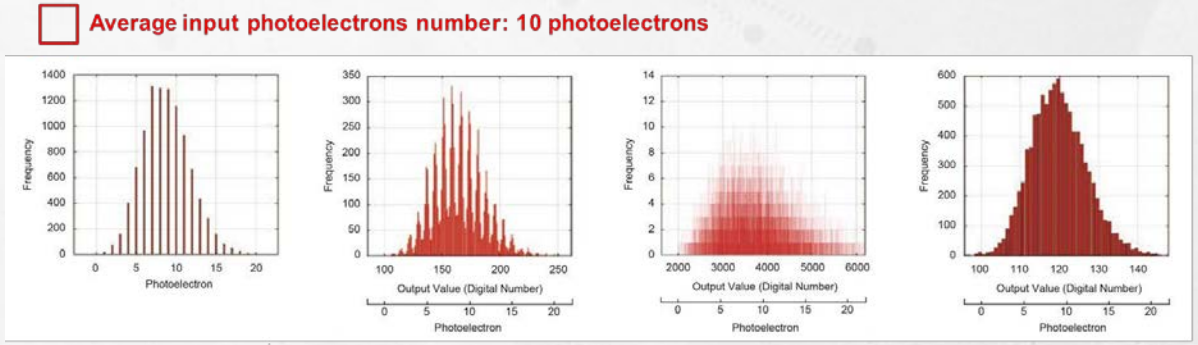
Photon Number Resolving Mode

Average input photon: 55 photons,
Readout noise 0.16 e- pixel









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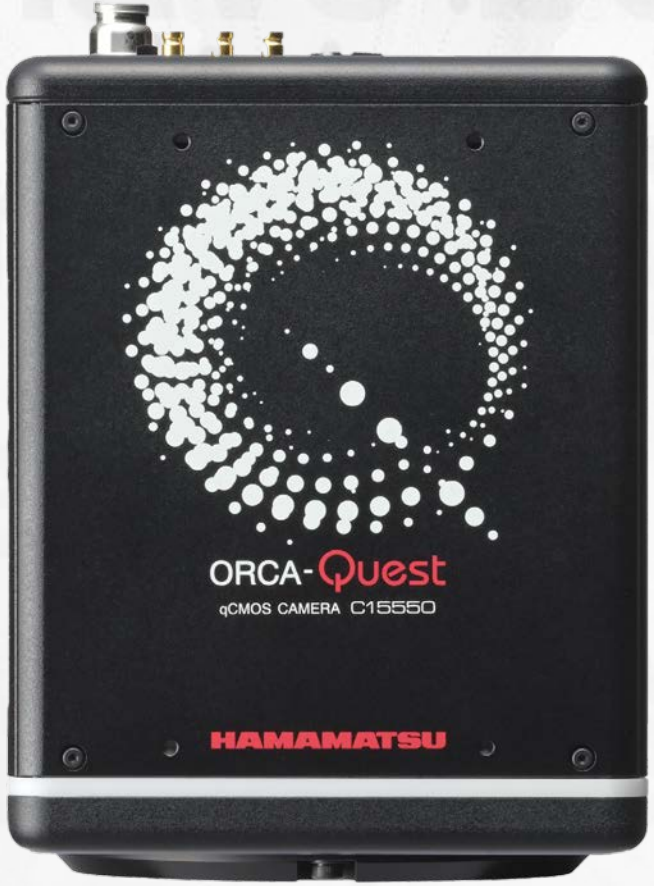
Groundbreaking
in concept and
unprecedented
in performance



Contact us

Book your demonstration

And ...

... Start your adventure

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