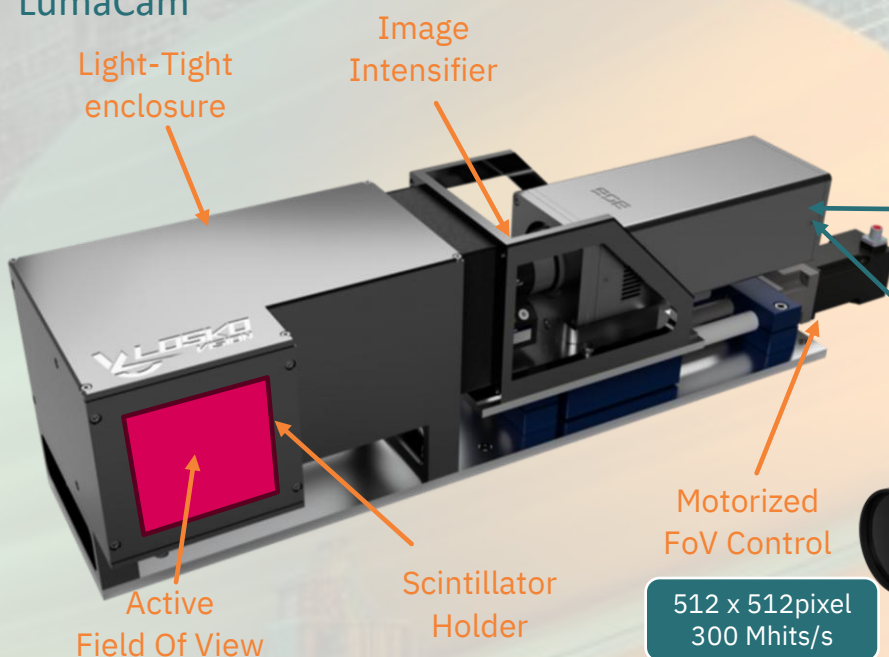


LumaCam Imaging

Advanced TPX3CAM detector for Neutron Science

LumaCam



Telesto Single



Telesto Quad



LumaCam & Telesto

LumaCam is scintillator-based neutron imaging and neutron diffraction detection system using Telesto, a novel event-driven time-resolved 2D detector.

LumaCam detectors offer a wide choice of scintillators for optimum detection efficiency for every beamline or neutron source.

In contrast to classical CMOS or CCD-based systems, LumaCam generates background-free images, using the time resolution of 1.56 nanoseconds to distinguish between neutron hits and gamma rays or scintillator afterglow photons. High detection efficiency based on event identification across a large dynamic range, allowing for use of comparatively thick scintillators.

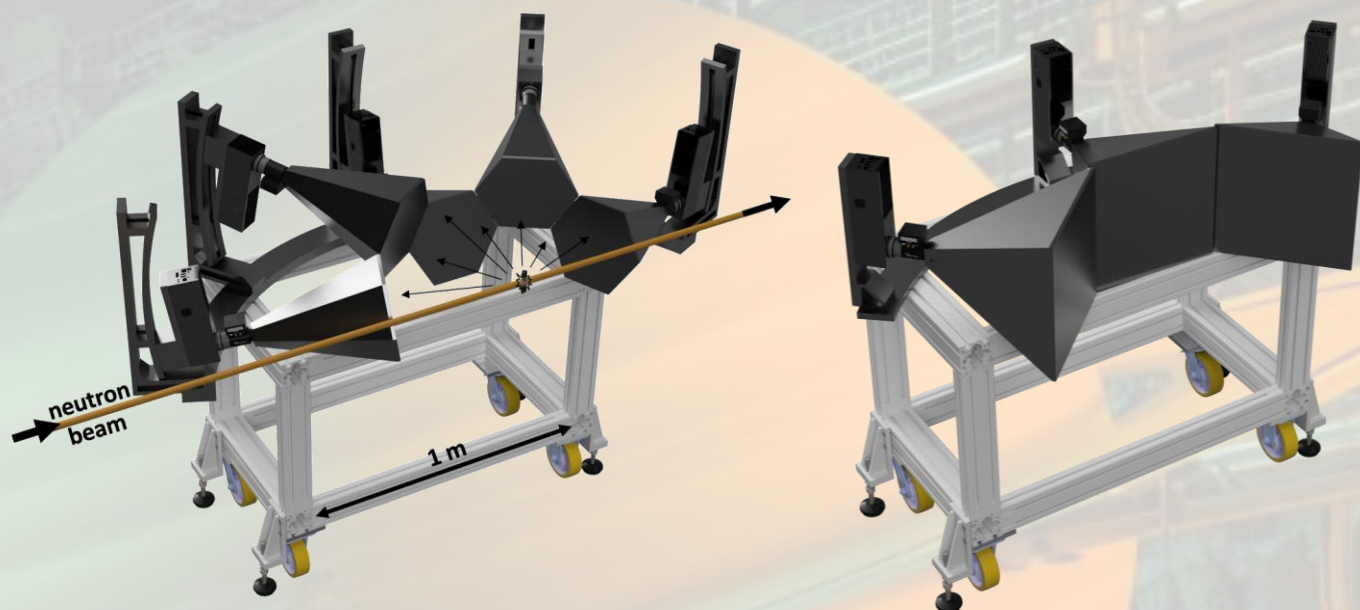
Thanks to the EMPIR processing software LumaCam produces quantitative images with a resolution of up to 5 Megapixel (Single) or 20 Megapixel (Quad).

LumaCam systems are used at numerous neutron science facilities such as Los Alamos National Laboratory, FRM II or ESS, Lund.

Sensor	
Material	Silicon with enhanced light sensitivity
Wavelength range	400 – 1000 nm
Detection limit	~800 photons per pixel, single photon sensitive with intensifier
Optics	
Sensor area	14.1 x 14.1 mm ² (Single), 28.2 x 28.2 mm ² (Quad)
Type	C-Mount (Single) or M-Mount (Quad)
Chipboard	
Pixel Pitch	55 µm x 55 µm
Max. Event Rate	Single: 80 Mhits/s, Quad: 300 Mhits/s
Readout dead time	Zero
Time bin resolution	1.56 nanoseconds
Effective frame rate	> 500 million frames per second
Pixel hit dead time	~475 nanoseconds + ToT
Readout mode	Data-driven, Time of Arrival, Time over Threshold
Other	
Computer Interface	10 GB/s Optical (40 Gb/s for Quad)
External Shutter	Yes, via C4 Triggerbox
Timestamping	260 picoseconds via TDC channels (LVTTTL)
Dimensions & Weight	28.8 x 8 x 9 cm, 2.2 kg
Cooling	Air-cooled (no special requirements for cooling)

LumaCam Diffraction

Advanced TPX3CAM detector for Neutron Science



LumaCam Diffraction

LumaCam Diffraction is a detector concept based on the LumaCam Imaging system, optimized for neutron scattering applications.

The modular concept allows to build compact and flexible large area 2D-detectors with angular resolution better than 0.01 degrees. The LumaCam Diffraction uses Chronos Teleso modules, an event-mode neutron counting detector.

In collaboration with the beamline science team ASI and LoskoVision will determine the optimum scintillator choice (standard scintillators, liquid scintillators) to achieve optimum neutron detection efficiency.

LumaCam provides clear discrimination between neutron and gamma rays. The rejection ratio can be adjusted by the end user to achieve optimum detection performance for all scattering applications in a wide range of neutron energies.

LumaCam Diffraction can be used for powder and single crystal diffraction, SANS, SESANS, reflectometry and spectrometry.

