

IMAGING

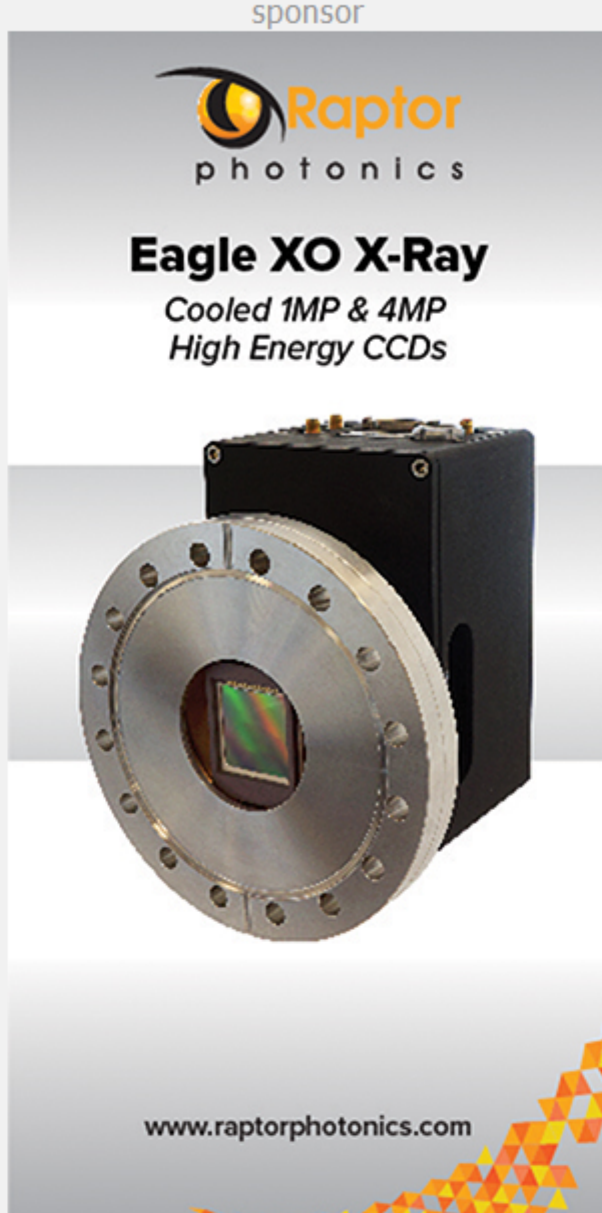
Tech Pulse



May 2016

Imaging Tech Pulse is a special edition newsletter from Photonics Media and Raptor Photonics Ltd. covering key developments in imaging technology.

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Holograms Gain Efficiency from Metasurface Fabrication Technique

Nanostructured metasurfaces have been incorporated into compact holograms, enabling the production of different images depending on the polarization of incident light. The highly efficient holograms lose very little light in the processing of creating the image, and are expected to improve antifraud holograms as well as those used in displays. "By using incident polarized light, you can see far a crisper image and can store and retrieve more images," said Harvard University professor Federico Capasso, who coauthored the study. "Polarization adds another dimension to holograms that can be used to protect against counterfeiting and in applications like displays."



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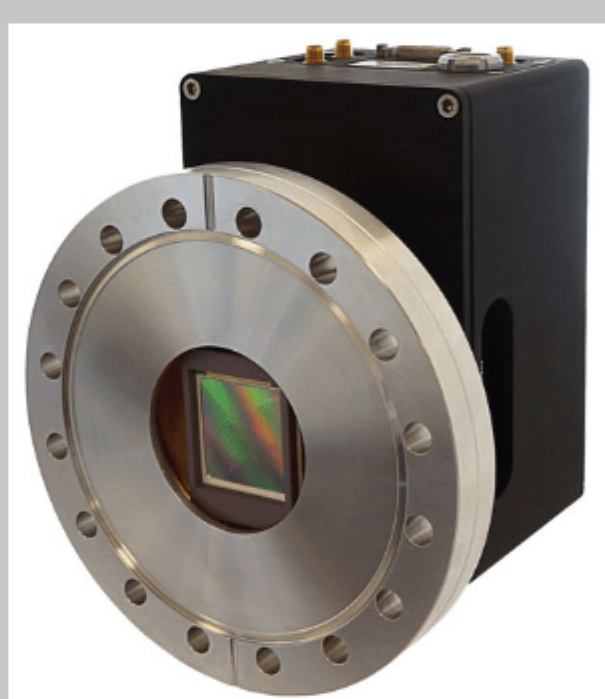
PROMOTED CONTENT



Raptor Photonics Ltd.

Introducing Eagle XO

Introducing a high energy version one of the most sensitive CCD cameras in the World. Using back-illuminated 1MP and 4MP CCD sensors from e2v, and putting into Raptor's proprietary PentaVac vacuum enclosure and cooling it to a delta of greater than -110°C, the Eagle XO is an open front detector with a range of flanges available.

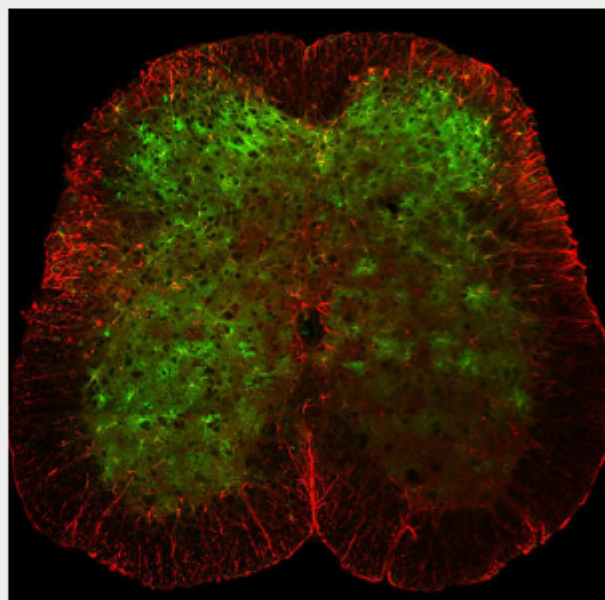


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Microscope Observes Spinal Cells in Freely Behaving Mice (with Video)

A microscope about the size of a penny has been used to observe everyday activity of cells within the spinal cords of mice, revealing that astrocytes — cells in the nervous system that do not conduct electrical signals and were traditionally viewed as merely supportive — unexpectedly react to intense sensation. Researchers from the Salk Institute developed fluorescence imaging approaches based on two- and miniaturized one-photon microscopy. The miniaturized microscope and related imaging methods offer insight into nervous system function and could lead to novel pain treatments for spinal cord injuries, chronic itch and neurodegenerative diseases such as amyotrophic lateral sclerosis (ALS).

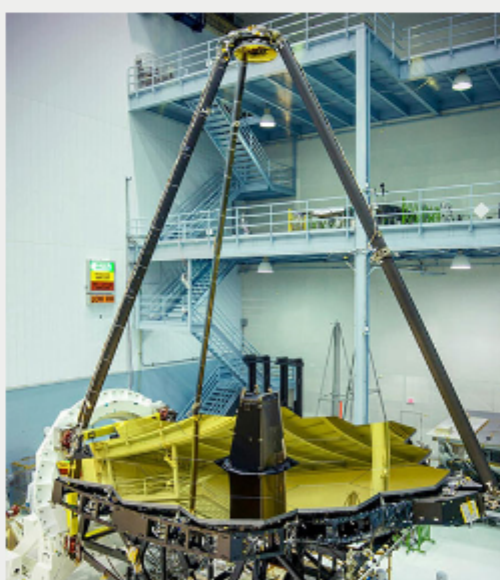


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JWST's Giant Golden Mirror is Unveiled

As part of the integrating and testing of the James Webb Space Telescope (JWST), NASA engineers have unveiled the giant golden mirror of the IR telescope — it is heralded as the largest mirror yet sent into space. The 18 mirrors that make up the primary mirror were individually protected with black covers when they were assembled on the telescope structure, and now, for the first time since the primary mirror was completed, the covers have been lifted. Each mirror is made of strong, light beryllium, and each mirror segment is about the size of a coffee table and weighs approximately 20 kg. A very fine film of vaporized gold coats each segment to improve the mirror's reflection of IR light.

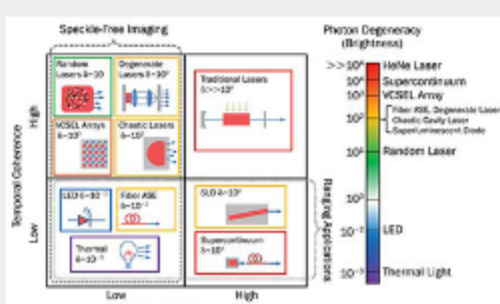


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An Alternative to LEDs for Full-Field Imaging

For some applications, the defining attributes of traditional lasers — high spatial and temporal coherence — can have an adverse effect. High spatial coherence introduces artifacts such as speckle in imaging, which degrades the image. While thermal sources and LEDs have both the low spatial and low temporal coherence required for applications, they do not provide the laser-level brightness needed for high-speed parallel imaging systems or imaging with the intense optical scattering common for biomedical imaging.



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