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 **NCBR**
National Centre for Research
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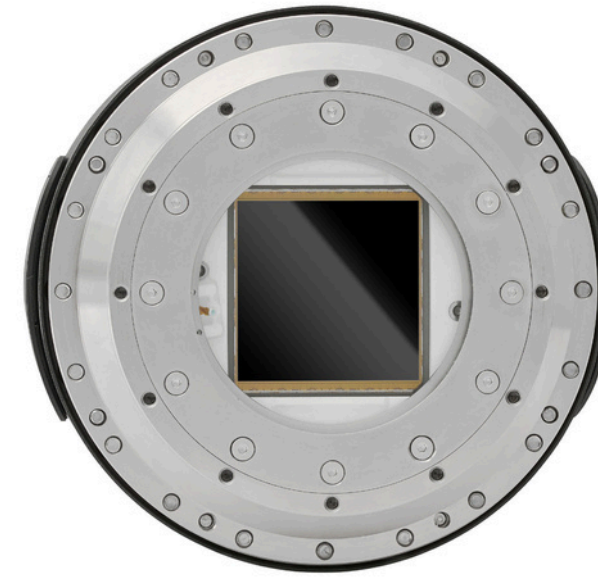
CreoSky 6000

Innovative
astronomical
camera



G6060 SST sCMOS camera

This innovative sCMOS-based autonomous astronomical camera is designed for versatile applications in Space Surveillance and Tracking (SST) and other areas of optical astronomy. The use of modern sCMOS sensors improves the camera's efficiency over conventional CCDs while significantly simplifying its power supply and cooling requirements.



The **CreoSky 6000** camera was designed for flexibility and modularity, enabling seamless integration with various sensor types and supporting innovative applications. One such application was explored in collaboration with the Polish Observatory in Chalin (part of the PST3a telescope array) at Adam Mickiewicz University in Poznań, using the PlaneWave CDK700 telescope.

Technical Specification Parameters

Sensor:	Gpixel GSENSE6060 sCMOS sensor (6k × 6k resolution, 10 μm pixel pitch), available in Front-Side or Back-Side Illuminated versions
Quantum Efficiency:	71,6%@550nm for FSI 95%@580nm for BSI
Full Well Capacity:	128ke for FSI 102ke for BSI
Temporal Noise (Low-Noise-Mode):	4,6e for FSI 3e for BSI
Readout Modes:	12bit, 14bit and HDR
Max FPS:	22 fps full-frame maximum speed at 12-bit. For ROI with row skipping the frame rate can be higher — for example, about 44 fps at 6k × 3k, or up to around 132 fps at 6k × 1k
Sensor Cooling:	TEC with fan-assisted air exchange, enhanced with a custom vibration-limiting solution. It can be customized for TEC and water/glycol cooling
Weight:	~5.5 kg (without external shutter and adapters)
Size:	Ø ~208 × 172 mm; can be modified with an external shutter and additional mechanical adapters
Data Transfer Interfaces:	10 Gb (fiber optic) and 1 Gb (copper) Ethernet with PTPv2 support, plus USB 3.0 device mode
Software Interfaces:	Ascom-based system with SDK library, REST API, self-hosted web interface, and embedded Linux libraries for custom software
Other I/O Ports:	USB 2.0 host for external devices (e.g., GPS), trigger and general I/O pins (customizable), including shutter interface, CAN or RS485 lines with optional customization
Other Functionality:	Sensor control implemented in FPGA, accompanied by a Cortex processor running Linux, with flexible data and processing paths, multi-frame buffering, and support for machine learning and OpenCV

Innovative astronomical camera

- High-performance GSENSE6060 sensor, widely used in scientific imaging applications, offering excellent sensitivity and low noise – further enhanced under cooling conditions
- Initial data post-processing within the camera module SoC, such as FPGA-based frame stacking or user-defined algorithms (including machine learning based ones) – implemented directly inside the module

- Designed for SST, NEO, and debris detection
- Built-in, independent Linux operating system, enabling stand-alone camera operation
- Full in-house production capabilities