QHYCCD

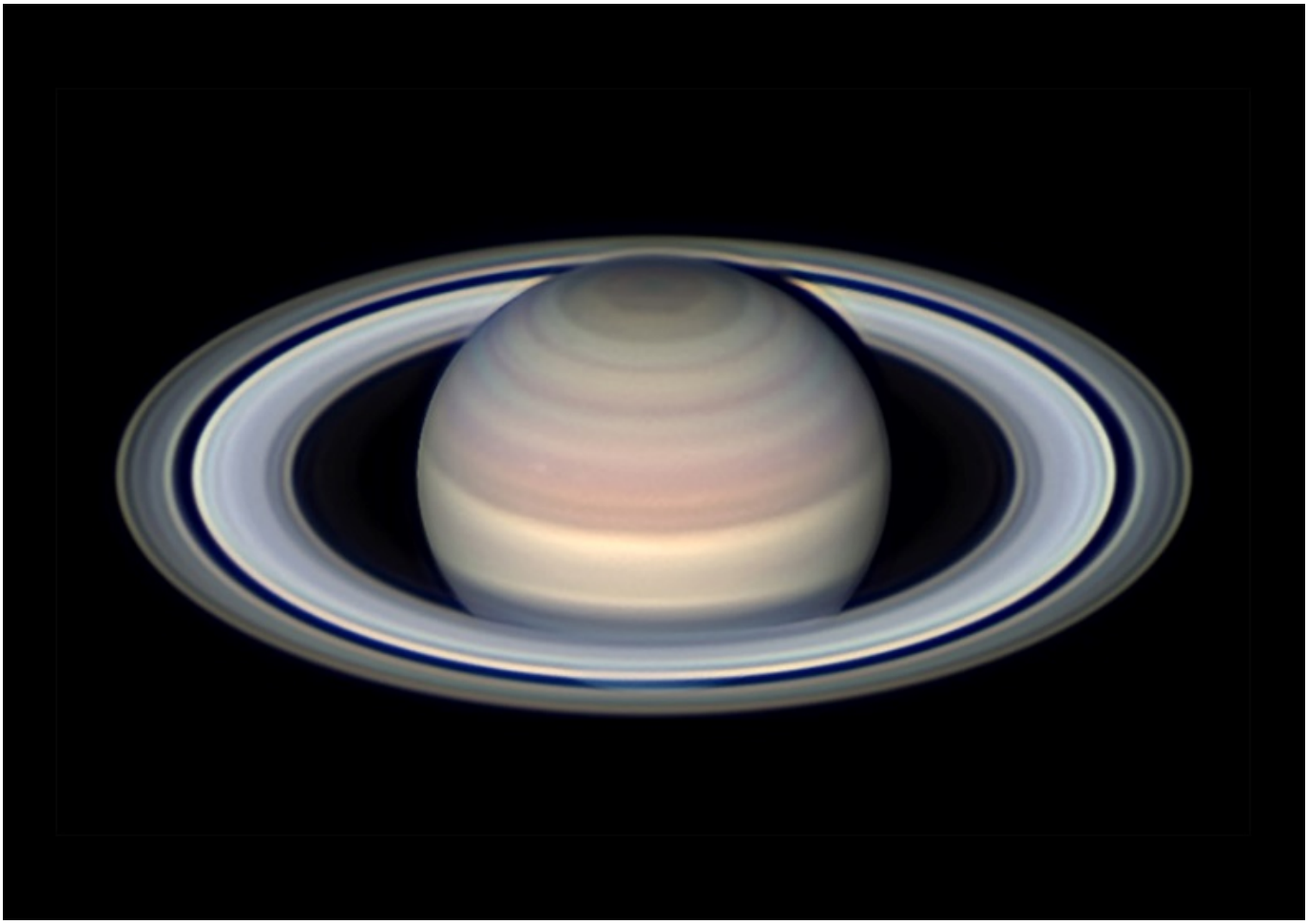
QHY Small Cooled CMOS Cameras QHY174/178/224/290

The QHYCCD Small COLDMOS camera series includes all of our cooled cameras with BSI (back-illuminated) and FSI (front-illuminated) CMOS sensors in optical format sizes smaller than 1 inch. These same sensors are also used in the uncooled QHY5III Series cameras. However, as the name implies, the Small COLDMOS camera models include efficient TE cooling as well as other more advanced features not found on the uncooled models.

- USB 3.0
- Regulated TE Cooling Delta -40C
- 128 MB DDR Frame Buffer
- ST-4 Compatible Guide Port
- Filter Wheel Port
- Anti-Noise Technology
- Anti-Amp Glow Technology
- Anti-Dew Technology

These additional features include a heated optical window to prevent external dew, a desiccant plug socket to help maintain a frost-free CMOS chamber, a 128MB frame buffer, a filter wheel port, and in the case of the QHY174M-GPS (Selected by the NASA New Horizon Team), an optional GPS timing module for highly accurate time stamping on individual frames. Dual-stage TE cooling reduces the sensor temperature to -40C or more below ambient and temperature regulation maintains a constant temperature set point. Due to the efficient TE cooling, single exposure times up to 30 minutes are possible on most models, making them suitable for deep space imaging of dim objects as well as brighter objects and planets.

All of the Small COLDMOS cameras use Sony Exmor CMOS sensors. Two models, the QHY178 and QHY290, use Sony STARVIS Exmore R back-illuminated sensors. STARVIS is Sony's designation for sensors capable of recording under starlight. These sensors have improved sensitivity and noise reduction - the key factors to enhancing image quality, while radically realigning their fundamental pixel structure from front-illumination to back-illumination. It retains the advantages of CMOS image sensors such as low power consumption and high-speed operation while dramatically improving sensitivity. With a conventional front-illumination structure, the metal wiring and transistors on the surface of the silicon substrate that form the sensor's light-sensitive area (photo-diode) impede photon gathering carried out by the on-chip lens, and this has also been an important issue in the miniaturization of pixels and widening optical angle response.



Saturn Image QHY-290M, Courtesy Christopher Go

Model	QHY-174M/C	QHY-178M/C	QHY-224C	QHY-290M/C
Sensor	Sony IMX174 Exmor CMOS	Sony IMX178 STARVIS Exmor R CMOS	Sony IMX224 Exmor CMOS	Sony IMX290 STARVIS Exmor R CMOS
Illumination	Front Illuminated	**Back Illuminated**	Front Illuminated	**Back Illuminated**
Total Pixels	2.3 Megapixels	6.3 Megapixels	1.2 Megapixels	2.0 Megapixels
Pixel Size	5.86um	2.4um	3.75um	2.9um
Pixel Array	1920 x 1200	3072 x 2048	1280 x 960	1920 x 1080
Optical Format	1/1.2-inch	1/1.8-inch	1/3-inch	1/2.8-inch
Shutter	Electronic (Global)	Electronic	Electronic	Electronic
Exposure Time	50us - 1800sec	50us - 1800sec	7us - 400sec	50us - 1800sec
FPS @ Full Resolution	138FPS	50FPS	150FPS	135FPS
FPS @ ROI	490@480x300	190@764x512	557@320x240	460@480x270
A/D Resolution	12-bit	14-bit	12-bit	12-bit
Read Noise	3e- to 5e-	0.9e- to 2.4e-	0.55e- to 3e-	0.75e- to 3.2e-
Full Well Capacity	32ke-	15ke-	19ke-	15ke-
Cooling Delta	-40C Regulated	-40C Regulated	-40C Regulated	-40C Regulated
Computer Interface	USB 3.0	USB 3.0	USB 3.0	USB 3.0
Weight (Mono/Color)	450g	450g	450g	450g
Reference Price (Mono/Color)	$939 / $899	$769 / $699	$449	$729 / $699
w/GPS (Cooled/Uncooled)	$1239 / $939	N/A	N/A	N/A

For more information visit http://www.qhyccd.com