



Equipment review

Astronomy tests QSI's 583 CCD camera

Quantum Scientific Imaging's compact CCD camera produces high-quality images. **by Bob Fera**

During the past several years, astronomers have seen an unprecedented number of high-quality, innovative cameras come on the market. While many of these products are from manufacturers well-known to seasoned imagers, others originate from companies relatively new to the scene.

One such group is Quantum Scientific Imaging (QSI) with its line of 500-series CCD cameras. Although a fairly recent

addition to the amateur astronomy market, QSI actually has been building digital imaging systems for nearly 20 years, and that experience clearly shows here.

It's all in the numbers

QSI has historically targeted its 500-series cameras at entry-level users, but with the introduction of the 583s and the 583ws (which includes an internal filter wheel), the company has ventured boldly into advanced-amateur territory.

Recently, I had an all-too-brief opportunity — thanks to an unforgiving Northern California winter — to test QSI's top-of-the-line camera.

The 583ws utilizes Kodak's popular 8.3-megapixel KAF-8300 sensor, which uses an 18mm by 13.5mm CCD chip and contains a matrix of 5.4-micron-square pixels. The tiny pixels make this detector ideally suited to short-focal-length instruments such as fast refractors, Newtonian astrographs, and camera lenses.

Unfortunately, I did not have such a telescope available at test time, so I attached the camera to my 14-inch Officina Stellare Ritchey-Chrétien reflector, which operates at f/8 and has a 2,845mm focal length. With this camera, it yields an image scale of 0.39"/pixel.

The QSI 583ws features a small lightweight body and includes a 2" nosepiece, making it simple to attach to any telescope with that size focuser. The 583ws



Quantum Scientific Imaging's 583 CCD camera series comes with all cords and connectors safely ensconced in a waterproof, custom-fit Pelican case. Equipment photos: *Astronomy*: James Forbes

also houses an internal five-position filter wheel in which QSI placed the filters close to the CCD. This allows the use of less expensive 1¼" filters — a real plus.

The camera package comes in a sturdy Pelican carrying case and includes a CD with drivers and plugins for *MaxIm/DL* and *CCDSOFT* camera-control software, all necessary cables, and a set of Allen wrenches. The initial installation process was painless, and the software has a professional look. The skies didn't cooperate that evening, however, leaving first light for another night.

Problem solved

When a clear evening finally arrived, I fired up *MaxIm/DL* and attempted to connect to the camera. It was at this point I ran into a problem: *MaxIm/DL* locked up, forcing a computer reboot.

The next day, I contacted QSI technical support and described the symptoms. The support technician who answered

Contact information

Quantum Scientific Imaging, Inc.
34145 Pacific Coast Highway, #512
Dana Point, CA 92629
[t] 888.774.4223
[w] www.qsimaging.com



◀ **The 583 series** houses Kodak's 8.3-megapixel KAF-8300 CCD chip. QSI electronically cools the chip with air, which reduces the amount of noise in exposures.

▶ **Emission nebula NGC 1931** in Auriga was the author's test image. It demonstrates the QSI 583's wide dynamic range, as well as its ability to record faint detail and register accurate color. *Bob Fera*



the phone, none other than QSI owner Kevin Nelson, immediately realized that old drivers for a USB-to-serial adapter caused my trouble.

The drivers were from the same company that supplies camera chips to QSI. The quick fix was to make sure I connected the camera to the computer before connecting the USB-to-serial adapter. Once I did that, all was well. QSI is working on the long-term solution, which will involve upgrading the outdated drivers.

Astroimaging

During the next few nights, I learned what a fine instrument the QSI 583ws is.



The QSI 583wsg is available with an Integrated Guider Port. This option allows you to guide using light collected by your main telescope because the mirror picks off the guide star in front of the filters.

The camera quickly cooled to -13° Fahrenheit (-25° Celsius), about 63° F (35° C) below the ambient temperature (50° F [10° C]), and it produced smooth, incredibly low-noise images.

My target was NGC 1931, a small but colorful emission nebula in the constellation Auriga. With exposures totaling just 3 hours of unfiltered luminance and 75 minutes each through red, green, and blue filters, the camera easily recorded both the pink emission and blue reflection nebulosity.

It also picked up the object's faint outer wisps, a testament to the camera's sensitivity. My only complaint is that download times are longer than I expected, between about 30 and 40 seconds per image, which rates slower than comparable cameras I've used.

A worthy option

Any discussion of QSI's 583ws would not be complete without mentioning an optional feature available on the company's 500-series product line — an integrated off-axis guider. With the guider, the 583ws becomes the 583wsg.

For the upgraded model, QSI replaces the camera's faceplate with one that includes a pick-off prism and guide camera port. This arrangement places the guide star image in front of the filters, greatly easing the process of finding such

Bob Fera is a longtime image contributor to *Astronomy* who captures celestial photons falling on Foresthill, California.

Product specifications

Quantum Scientific Imaging QSI 583

Type: CCD camera

Chip: Kodak KAF-8300

Pixel array: 3348x2574 total

Pixel size: 5.4 microns, square

Exposure range: 0.03 second to 4 hours

Dimensions: 583s: 4.45 by 4.45 by 2

inches (11.3 by 11.3 by 5 cm);

583ws: 4.45 by 4.45 by 2.5 inches (11.3 by 11.3 by 6.4 cm)

Weight: 583s: 34 ounces (950 grams);

583ws: 39.5 ounces (1,120g)

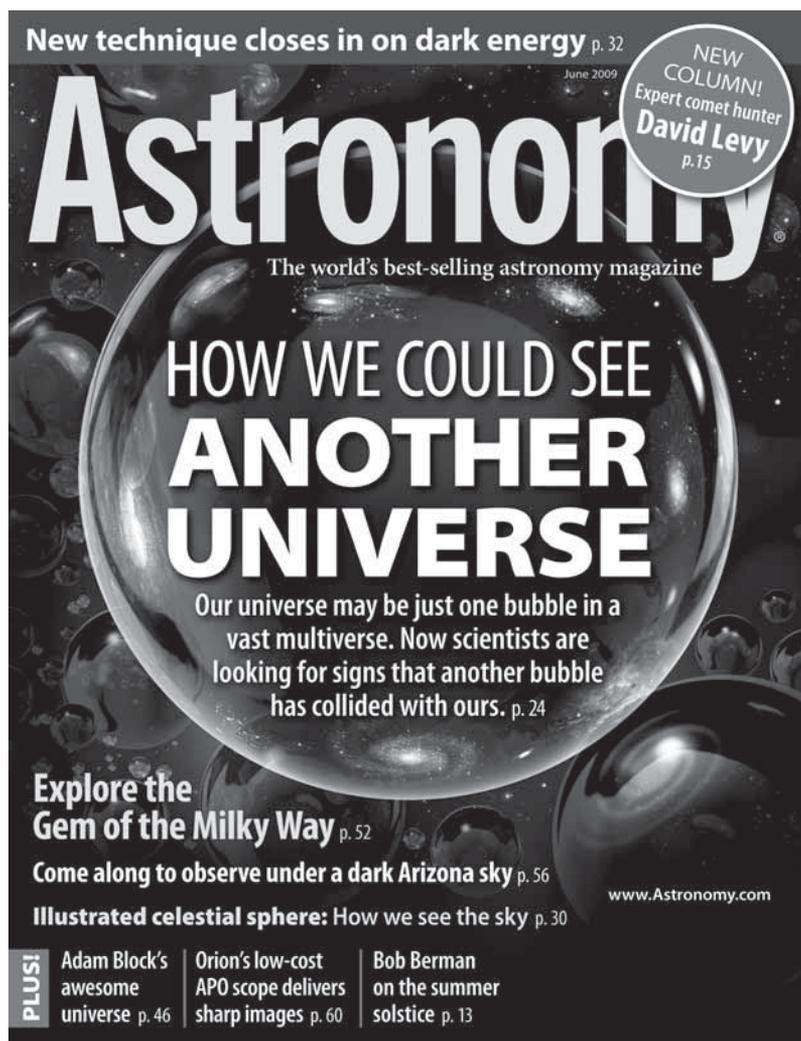
Price: 583s: \$2,795; 583ws: \$3,190;

583wsg: \$3,690

stars. The pick-off prism is comparable in size to that of other popular high-end off-axis guiders. Using the supplied adapters, the guide camera locks solidly onto the 583wsg body, yielding a system with no flexure. The focusing mechanism is a bit awkward, with adjustments that require repeated removal and replacement of the guide camera. QSI describes this procedure clearly in the well-written user manual included on the CD, and you only need to do it once. This is truly a worthwhile option if you don't already own a separate off-axis guider.

Overall, the QSI 583 series impressed me greatly. Its quality construction, excellent performance, lack of electronic noise, innovative features, helpful technical support, and attractive price make it a great choice for beginning and advanced astroimagers alike. ☺

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