

Point Grey Research Cameras Quick Glimpse Review

May 2011

Stephen W. Ramsden
Director – solarastronomy.org

I have been investigating and using these incredible Point Grey Research cameras for about 6 or 8 months now and have been trying to come up with the best and most informative review of them for the solar astronomer. If you have read my other reviews you know that I am not one of those “quote all the specifics and talk about all the abstract concepts” kind of guy. Instead I like to just go use the equipment and then report back on how it worked and how I felt about it. I will endeavor to do the same here. It may be difficult though as I have 4 PGR cameras that I have been actively using for months now and they each have a unique personality and pros and cons.

The cameras in this review were all capable of 16 bit recording and the models used are as follows:

PGR Scorpion

1600 X 1200 monochrome



Technical specs no longer on the PGR site

PGR Flea 2

640 X 480 monochrome Flea®2



At 29x29x30mm, the Flea®2 is even smaller than the original Flea camera and is designed to have the form factor of similar industry standard analog cameras. The 800Mb/s interface enables full frame rate RGB image transmission and even more cameras on the same bus. The IEEE-1394b cable with jack screws allows a more secure connection to the camera.

Sensor: Sony 1/3", 1/2", 1/1.8", 2/3" CCDs, Color/BW

Resolution: 0.3, 0.8, 1.3, 1.4, 2.0, 5.0 Megapixels

Frame Rate: 7.5 FPS (FL2G-50S5) to 80FPS (FL2-03S2)

Dimensions: 29 x 29 x 30 mm

Interface: 9-pin IEEE-1394b 800Mb/s interface



[larger image](#)

[Download Product Datasheet](#) | [Getting Started Manual](#)

PGR Grasshopper

2448 X 2048 monochrome



The Grasshopper® IEEE-1394b (FireWire) digital camera line offers a large selection of high resolution, high sensitivity sensors and an ultra fast 800Mb/s digital interface. Attractive pricing makes these powerful cameras ideal for OEMs and system integrators who need compact systems that deliver 0.3M, 1.4M, 2.0M or 5.0M images at high frame rates. The Grasshopper cameras are particularly effective in demanding imaging applications such as those used in electronics manufacturing, life sciences and microscopy, surveillance and security, and ITS.



[larger image](#)

Sensor: Kodak and Sony 1/2", 1/3", 1/1.8" or 2/3" progressive scan CCDs

Resolution: 640x480, 648x488, 1384x1036, 1624x1224, 2448x2048

Dimensions: 58mm x 44mm x 29mm

Interface: Dual 9-pin IEEE-1394b 800Mb/s ports

[Download Product Datasheet](#) | [Getting Started Manual](#)

PGR Chameleon

1296 X 964 monochrome



Chameleon®

The Chameleon™ USB 2.0 digital video camera from Point Grey Research is a complete, cost effective and reliable imaging solution. A high sensitivity Sony EXview HAD CCD® sensor, combined with a hi-speed USB 2.0 digital interface, makes the Chameleon an ideal choice for demanding imaging applications such as object and gesture tracking, test and measurement, life and bioscience, augmented reality, multitouch display, security and biometrics, and robot guidance.

[Download a comparison of the Sony ICX445 with other CCD's](#)

Sensor: Sony 1.3MP 1/3" ICX445 EXview HAD CCD

Resolution and Frame Rate: 1296x964 at 18 FPS

Digital Interface: USB 2.0 5-pin Mini-B interface

Dimensions: 25.5 mm x 41 mm x 44 mm

General Purpose I/O: 7-pin connector for trigger and strobe



[larger image](#)

First off let me just say that every one of the cameras is of outstanding build quality and very rugged. They are all made in Canada and shipped in little white cardboard reinforced boxes with serial numbers, date packed, clear instructions on getting the software, etc... They appear to be designed for the serious imaging needs of modern industry. I want to also say that everyone at Point Grey was extremely professional and courteous in response to both my emails and phone calls. Their technical support person answered the phone and was actually very knowledgeable about the product. I did not have to get transferred to 5 or 6 different people to find someone who wasn't just reading the standard tech support stuff from a computer screen. These people provided world class support and sales service. I'm a big fan of this sort of experience and frankly, won't buy from companies who don't provide it.

Again, I am no scientist or optical engineer so this may be a little lacking for those of you who want to investigate the inner workings or alter the camera for your use. I am a very experienced solar imager though and believe that I can give you a good report on these cameras in the field.

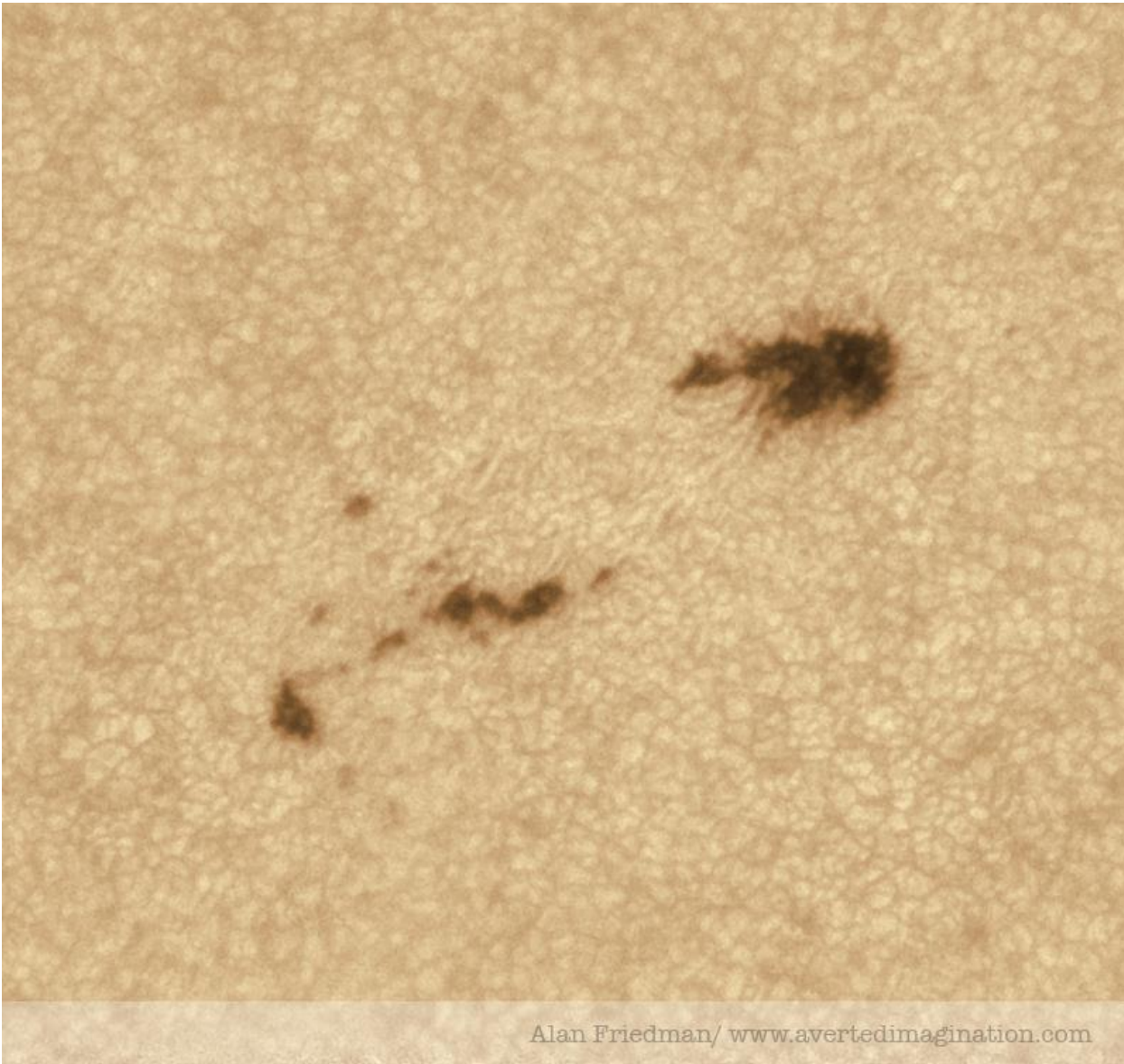
Let's start with the Scorpion.



I started using a PGR Scorpion camera in early 2010. These cameras are useable on Linux, Windows or Mac platforms. I tried them all on Mac and Windows. They all work best on the Mac but can easily be used on PC's also. The only problem is that you have to have a powered FireWire port on your PC in order to use them. My old Dell Inspiron did not have this so I ended up having to purchase an externally powered PCMCIA FireWire card to use the camera on my PC. This was an additional \$80 but well worth it once I started using it.

The scorpion has a dull chrome finish and is very light. It did not come with any eyepiece adaptors but once I found one I installed it onto several scopes with no balance or weight issues. I am a long time Imaging Source DMK user and can tell you that this camera is a little bit taller and about half as deep. It is also lighter than the DMK line.

This is Alan Friedman's work with the Scorpion:



I found it to be an incredibly good camera with an enormous amount of range sensitivity. It recorded at 30fps in 8 bit mode and 15 fps in 16 bit mode under full resolution.

This camera is no longer sold new but if you can find one used for \$300 or so I would strongly recommend it. It is as solid as a rock workhorse.

I use all of my cameras in my outreach program-The Charlie Bates Solar Astronomy Project-to broadcast live images of the Sun through different scopes and under a wide range of conditions. The Scorpion has never failed me from 10 degrees F up to 110 deg F. It runs all day long through hundreds of students using it without the slightest hiccup. Its imaging capabilities are very similar to the DMK41 except that it has a faster frame rate and higher resolution.

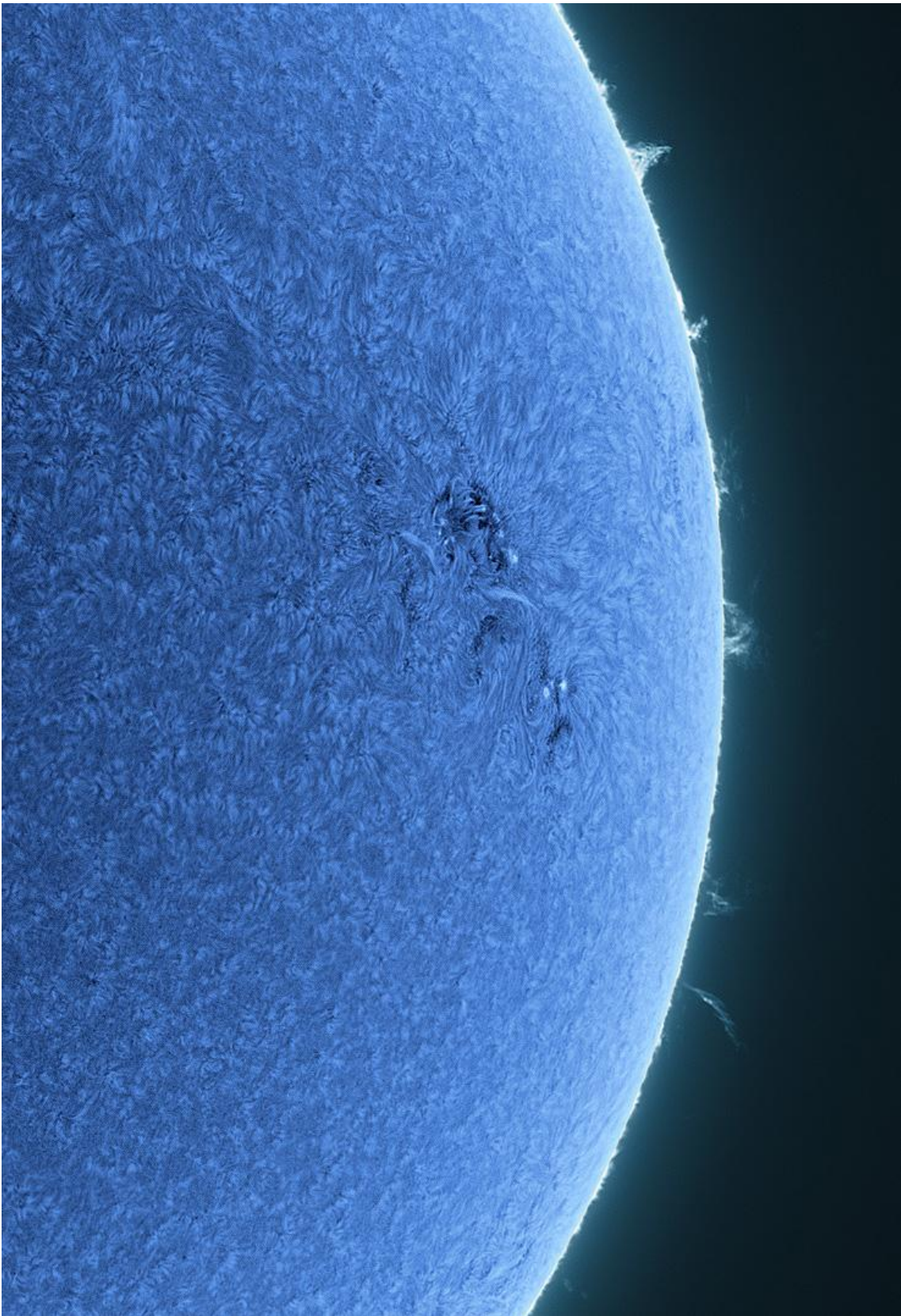


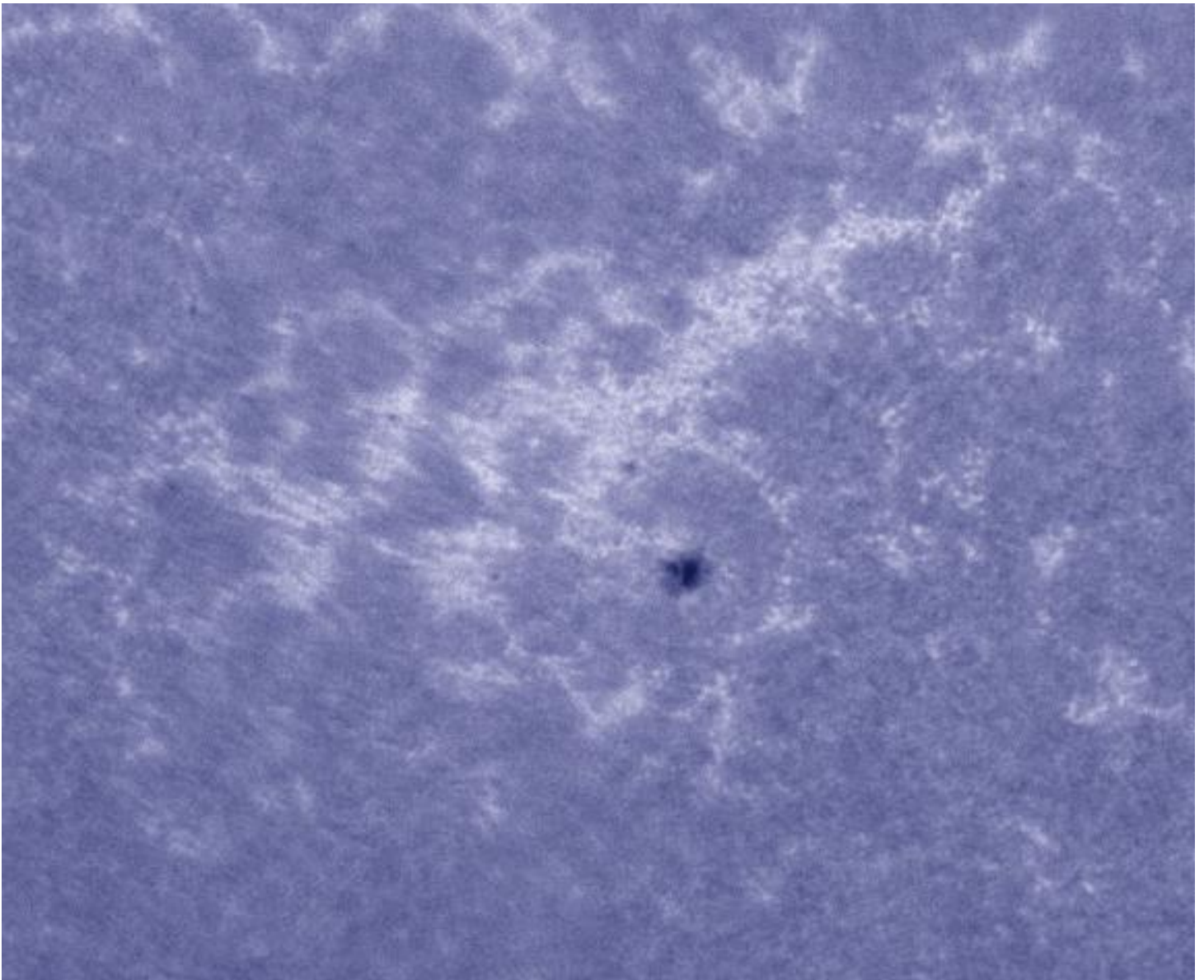
Figure 1 © Alan Friedman | all rights reserved

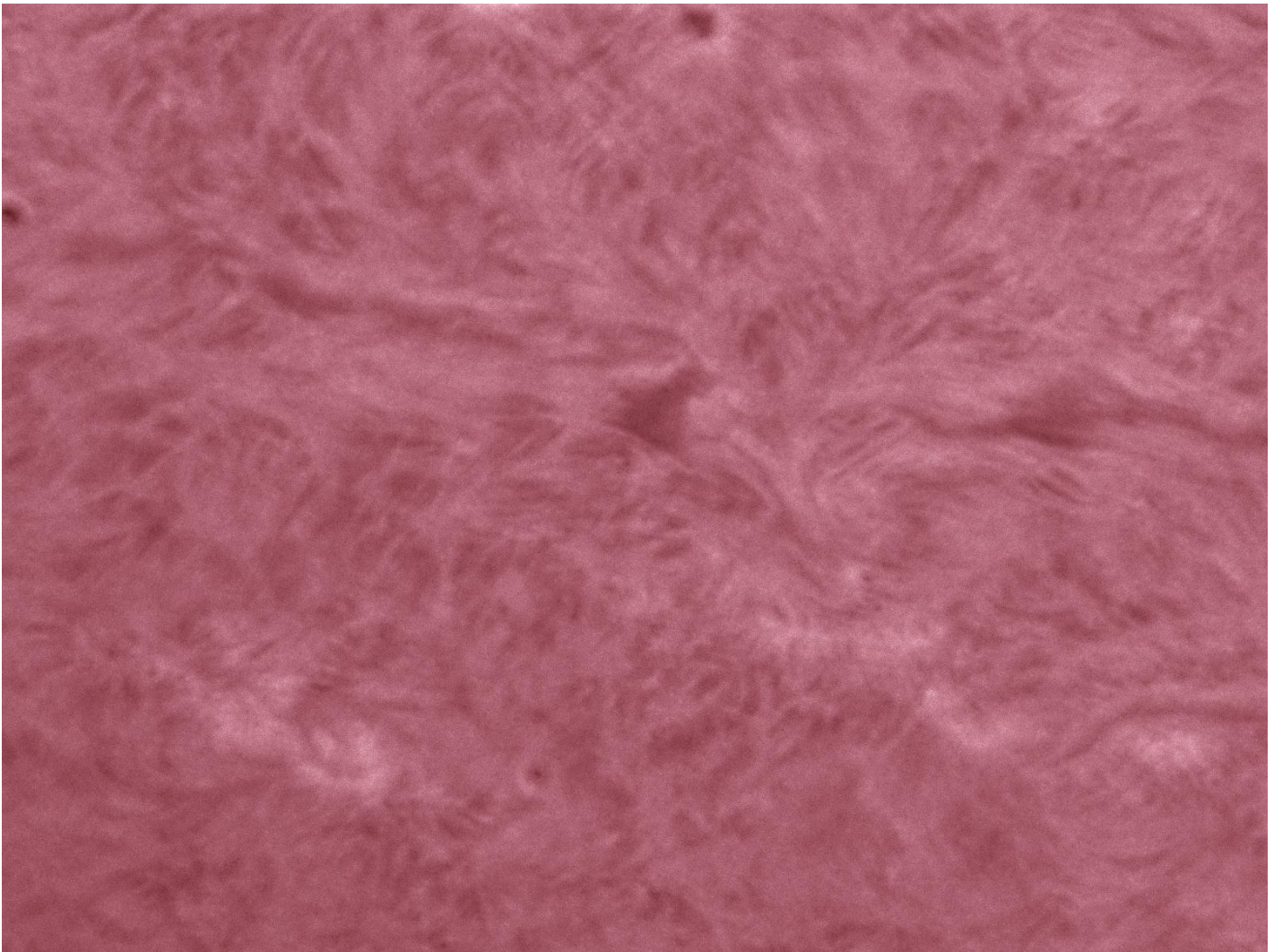
Now on to the Flea 2.

The Flea 2 is a very inexpensive camera with a small chip (1/4") that has a fantastically high frame rate at 80fps. It works very well for long focal length shots with a small FOV. The camera is so small you can easily carry it in your shirt pocket if you wanted to. It is about the size of a stack of 10 quarters if they were squared off.

This camera is also a FireWire unit so it works best with a Mac using ASTRO IIDC. The Flea really excels when taking small FOV prominence or granulation shots. It is capable of gathering an enormous amount of data in just 30 or 40 seconds. This is very beneficial when trying to capture quickly changing solar features. What the camera lacks in resolution it certainly makes up for in frame rate.

Here are a couple pictures from my CaK diagonal and LS 35 using the Flea 2:

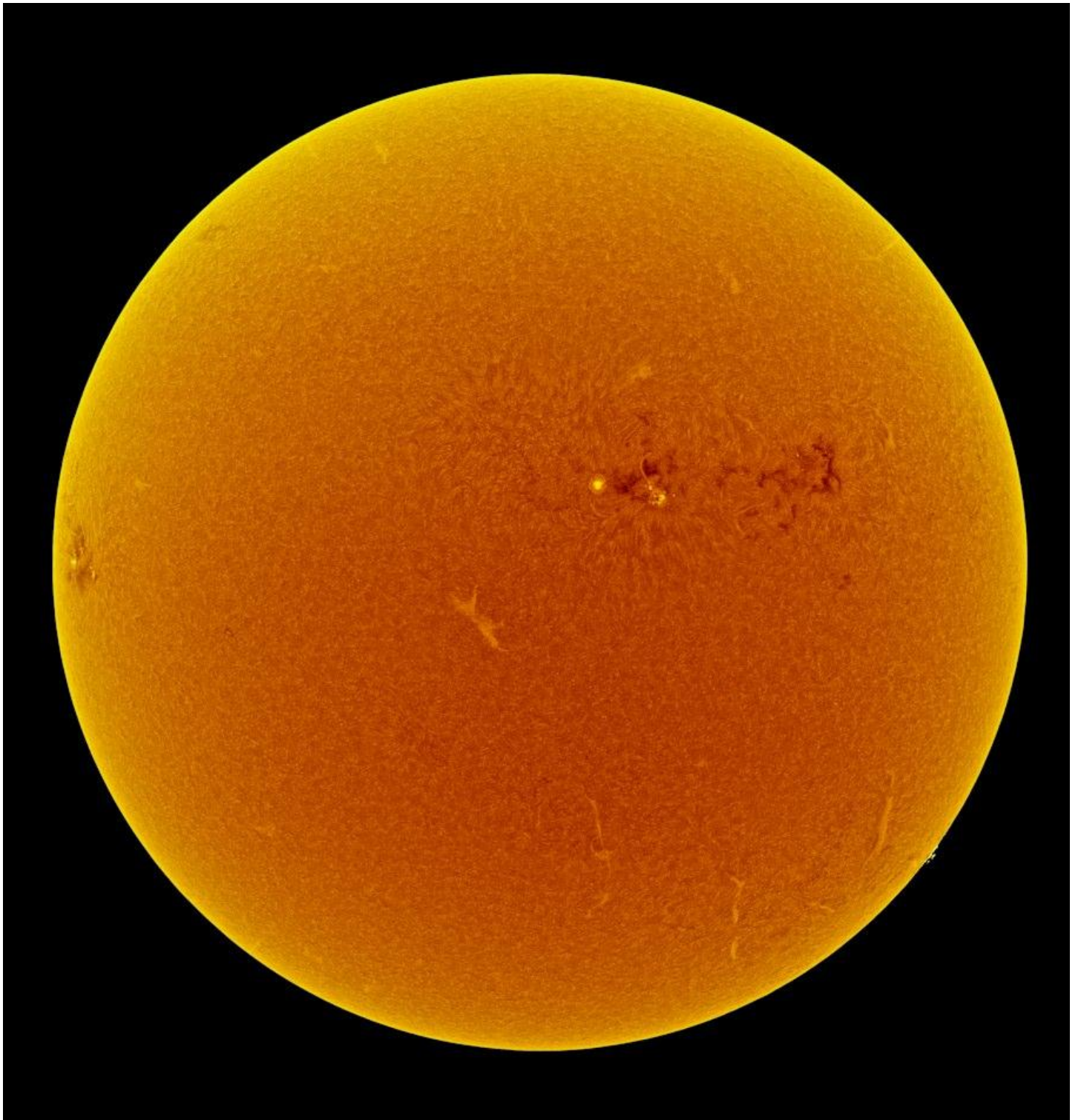




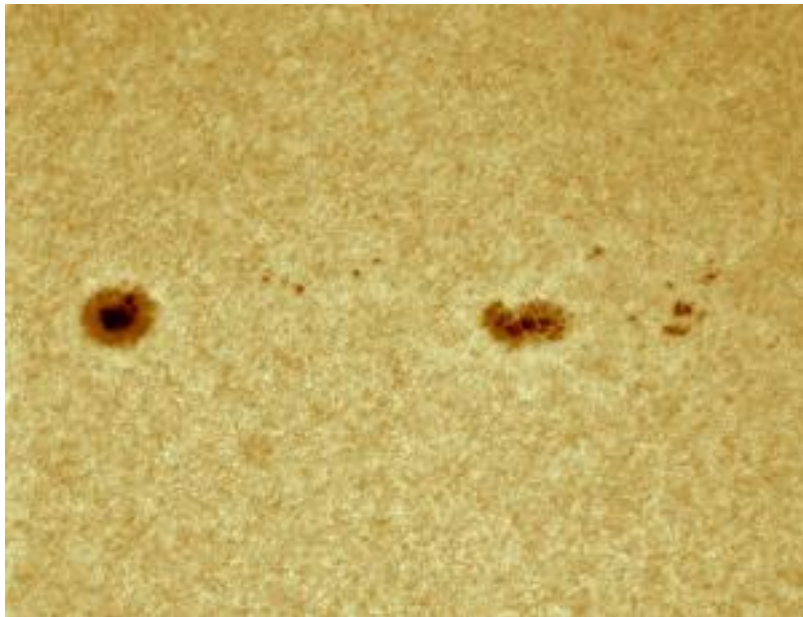
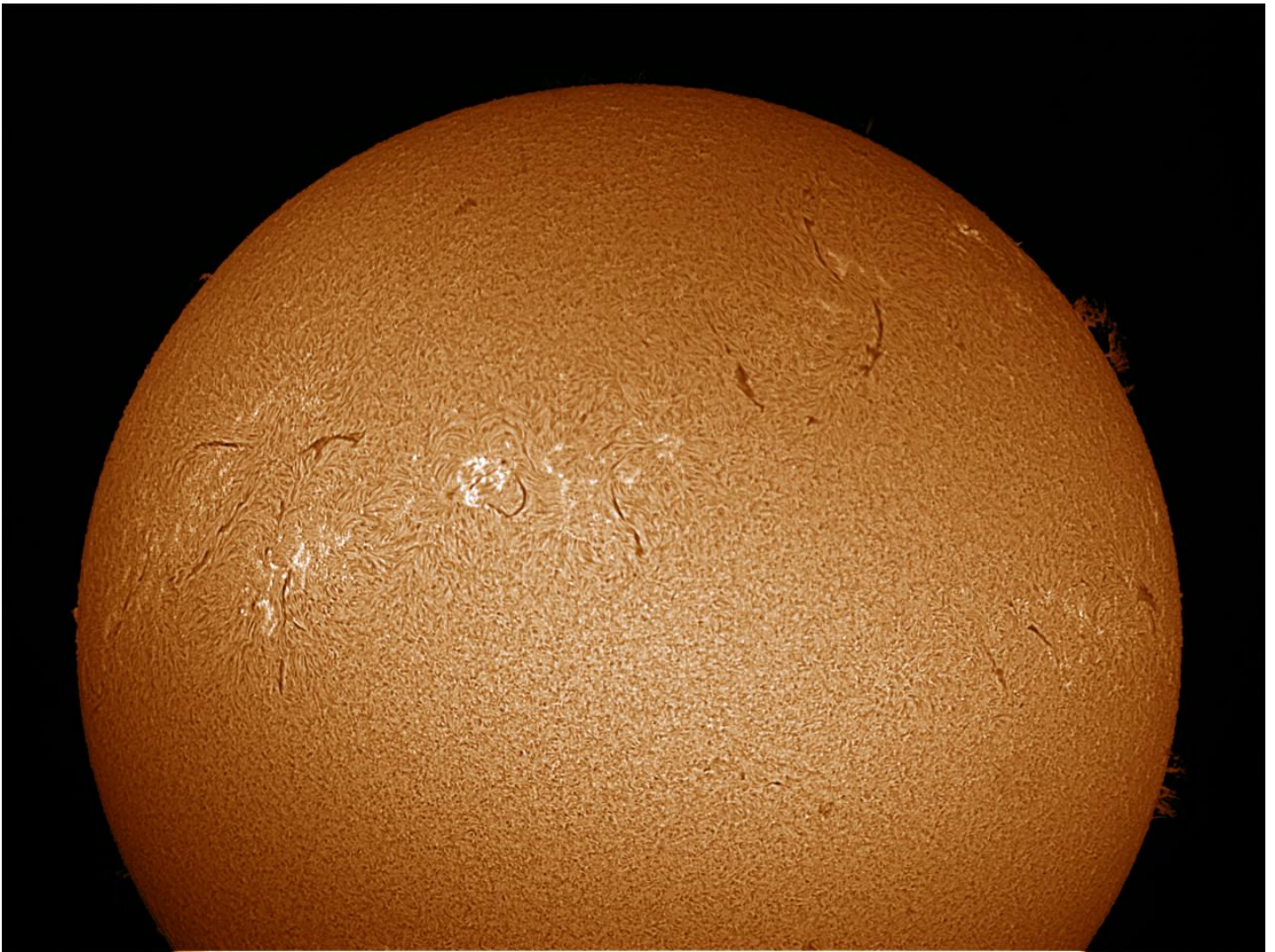
PGR Grasshopper

The Grasshopper camera is certainly the flagship of my PGR fleet. It is also fairly expensive at around \$2500. This camera can provide stunning full disk high resolution (2448X2048) images at a high frame rate of 15fps. It is the largest camera as well but it is not unwieldy. It can also go as high as 200fps in the 640X480 mode. This is incredible.

The Grasshopper is a pleasure to use and it will deliver in any situation. The below is a photo from Brian Shelton using a Grasshopper on a SolarScope double 70 filter set.



Here is one of my pictures using the Lunt 100mm H-Alpha scope and a Grasshopper:

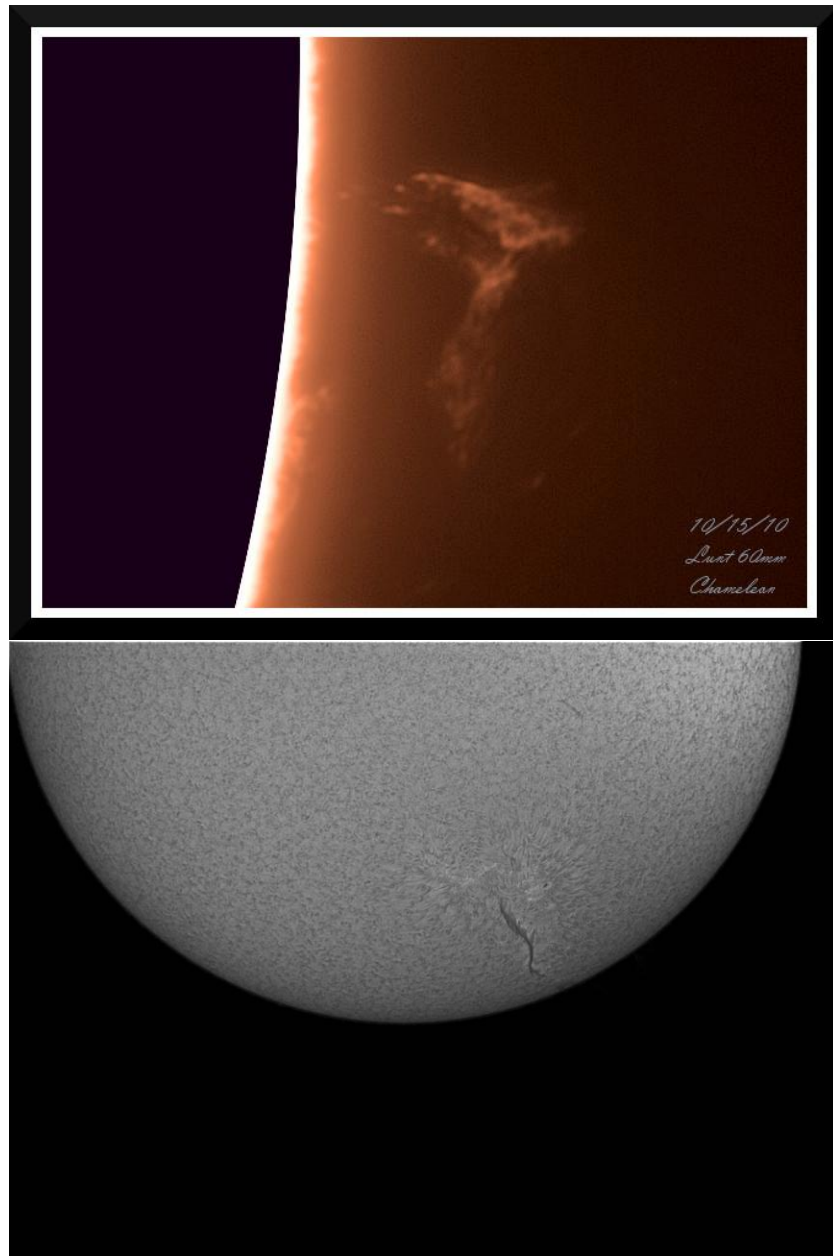


The Chameleon:

I believe that the Chameleon is in line to sweep away the competition in the amateur solar astronomy market. This camera is so tiny that you hardly know it is on your scope.

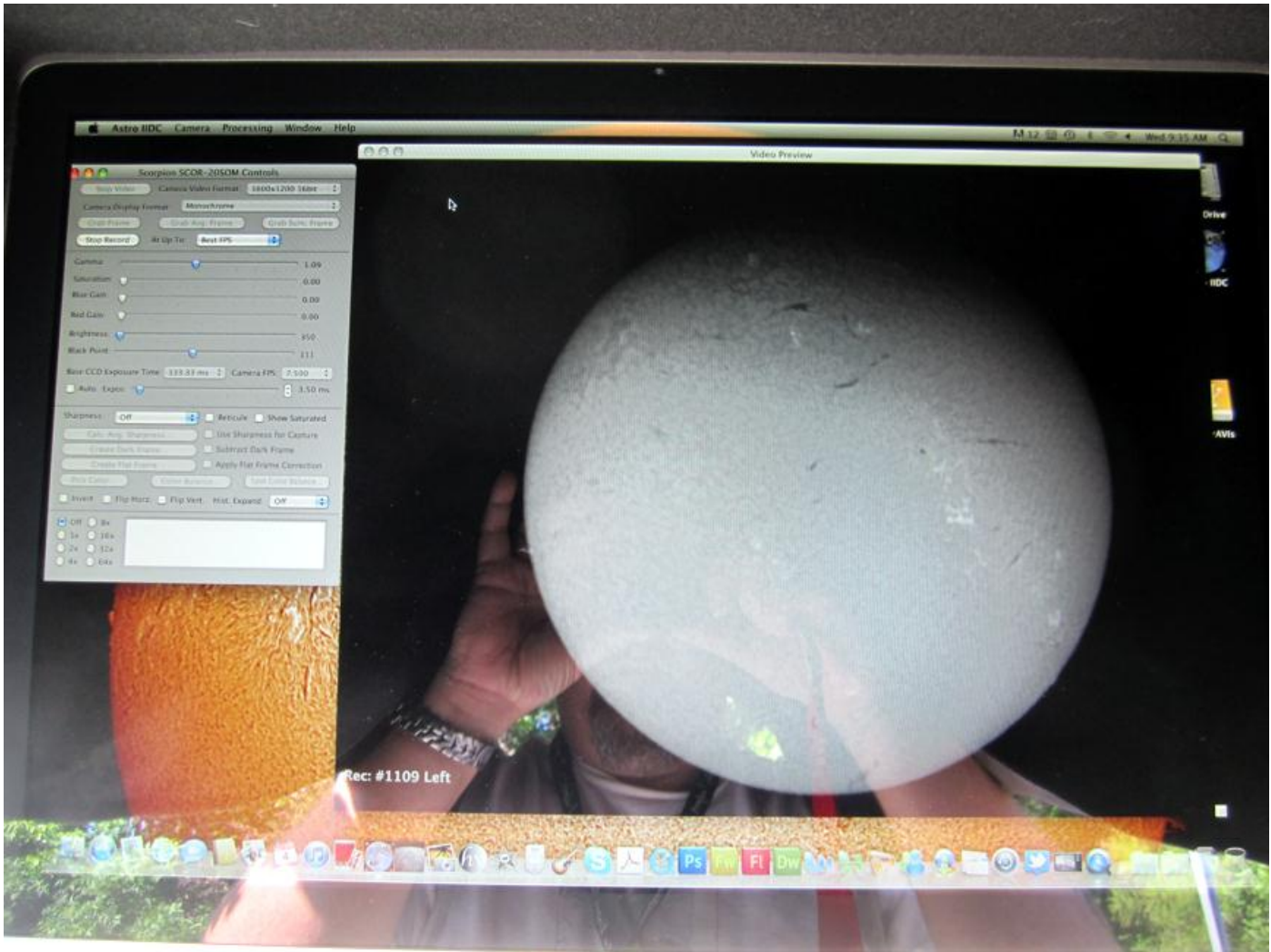
It provides 8 bit digital data at 18 fps at max resolution of 1296X964. It can also provide 16 bit digital data at lower frame rates. This camera is reasonably priced in the \$300 range and it is extremely easy to use.

Here are some pictures from Benjamin Perlmutter using the Chameleon and a Lunt 60:

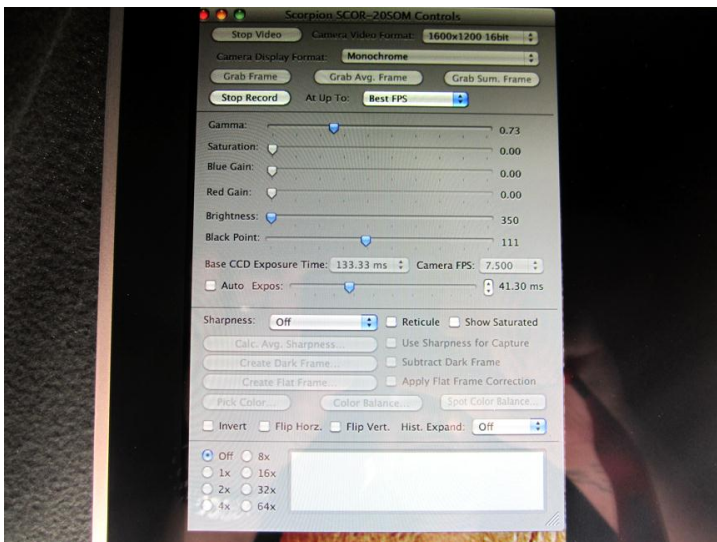


Now, I know I have just given a cursory glance at each camera in this review. I wanted to speak of all of these cameras for the rest of the review. PGR does not have a fancy astronomy labeled line of products as of this review. They market to high end imaging needs in industry. Their software interface for the PC is a little hard to follow for astronomers who

are used to just an exposure, gamma and gain button. There are so many choices and features available through their FlyCap software that it was a bit daunting for me to try and learn how to use it. Since I am a Mac guy anyway I just use them with the Macbook Pro in the field or broadcast their images on two iMacs that I setup at outreach events.



The program ASTRO IIDC makes imaging and stacking with the PGR cameras a breeze. There are a few choices sprouting up for Mac and PC use but this one is stable and has been around for a while.



The interface is intuitive and WYSIWYG based. I like it very much.

PGR has a wide array of cameras well suited for the growing market of solar imagers. I would strongly recommend this companies products based on their quality and their stand behind service staff who will not let you down. I would like to see a more friendly PC based software interface or perhaps an included light version of ASTRO IIDC with these cameras as well as a 1.25 inch to C mount adaptor. This would make it much more attractive to the astronomy types out there and would position PGR as a real contender in the solar/planetary imaging community.

Thank you for reading the quick glimpse review of PGR and I hope you are fortunate to get your hands on one.

Stephen Ramsden