

# Sierra Remote Observatories Newsletter

## INSIDE THIS ISSUE:

Update: New Observatory	1
In the Spotlight: Martin Pugh	1
Recent APODs & Photometry	2
Roof Management System	2
Our First Dome	2
Our Journey at a Glance	3
Astrophotography Tips	3
Tips and Etiquette	3
Brief Summary of SRO	4
A Word from the Owners	4

### FunLink:

[Follow this link to our video page, which includes a drone overflight of SRO, as taken by Planewave while installing a 24" CDK \(while the new observatory was in early construction\).](#)



Above: Original 8 individual observatories and first large Multi-Telescope Observatory.

## The Second Large Observatory is Finally Here

Our goal at SRO, since first light in 2007, has been to provide a stable and productive environment for the professional and amateur astronomer. The construction of our new 40x30 foot observatory is our next step towards reaching that goal

In building the new observatory we have incorporated all that worked well in the first building and updated the rest. The new building can hold up to 14 telescopes, from small reflectors to 24" RCs and CDKs. This will bring SRO's total to nearly 40 telescopes (plus a few in the future).

The new building has internally powered ventilation, to decrease the cool down time in the early evening. As with all our roofs, we have the M1-oasis and our



Original Multi-Telescope Building

proprietary software ensuring the roof opens and closes as needed throughout the night.

As with the previous buildings there is fiber optic internet for fast upload and download speeds. Also, we now have satellite internet backup, in the unlikely event of any temporary loss of our fiberoptic network.

The building is steel reinforced wood with wood flooring, in order to decrease the observatory's thermal footprint.

We will continue to have on-site support, handled by the owners and Sam Miller, who is well known to most everyone at SRO. Imaging continues to be 1 arc-second with easy access & on-site support.

## In the Spotlight: The Stellar Martin Pugh

Anyone who has looked at an APOD will recognize Martin Pugh's name. Martin is an award winning astrophotographer and frequent lecturer at the AIC, with expertise in image acquisition and processing. Martin and Bill Snyder first

came to SRO in 2011, productively sharing a 17" PlaneWave CDK. They quickly posted APODs at a rate rarely seen. Martin has realized every amateur astrophotographer's dream by having an active observatory in both hemispheres. This

year Martin has amazingly claimed 3 NASA APODs over a 5 week period, for a total of 13 APODs's from SRO. Please see a few of his beautiful APODs on page 2, or at our site at: [www.sierra-remote.com](http://www.sierra-remote.com).

A few (last 5) of our most recent APODs:

APOD: M51  
Martin Pugh: 5/2/15



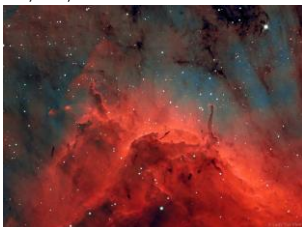
APOD: NGC 4725  
Martin Pugh: 4/16/15



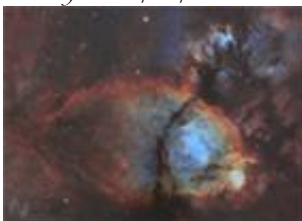
APOD: NGC 2403  
Martin Pugh 3/27/15



APOD: Pelican Nebula  
Larry Van Vleet  
03/04/2015



APOD: NGC 1795  
Bill Snyder: 12/24/14



## Recent APODs and Photometric Research

With our clear skies and talented members, APODs were bound to happen. At SRO we have highly laminar airflow with summer seeing of 1 arc-second, 237 photometric days each year, no monsoons and average wind speeds of 1 mph. We are also dark, at 21.78 mag/sq arcsecond, V band. On this page we've featured a few recent APODs from SRO. It just isn't possible to show them all and full listing of

our APODs can be found on our website at [www.sierra-remote.com](http://www.sierra-remote.com).

Everyone should also note that the great conditions at SRO are not just for imagers. Fredrick Ringwald, Professor of Astrophysics at Fresno State University, continues to publish work on cataclysmic variables. He has published several peer reviewed articles based on data obtained from his 16" DFM RC. We are honored that he

continues to collect his data at SRO.

We are also fortunate in having Jurgen Wolf, Professor at the University of Stuttgart and Senior Research Scientist at NASA/SOFIA, utilizing a 24" Officina Stellare at SRO. Graduate students use the telescope for research and the telescope is used as a test bed for new hardware and software for NASA's SOFIA project.

## Our Intelligent Roof Management System

SRO uses an intelligent roof management system based on the commercially distributed 'm1OASYS' roll-off roof controller and a custom developed roof management application that monitors real-time weather conditions and responds accordingly. Weather is monitored at the SRO site via a number of weather telemetry capture devices and the data fed to the real-time

roof monitoring app via SRO's communications network. Current weather conditions are then evaluated once each second for any kind of actionable roof event such as changes in cloud cover, humidity, dew levels, or precipitation. Should an actionable weather change be detected, the roof will then be closed to protect client equipment from any kind of adverse conditions.

Improvements in weather are also monitored in real-time and once good observing conditions have been re-established, the roof will be re-opened to provide optimal client access to productive observing time. The observatory is designed so that the roof can close safely with the scopes in any position.

## Clamshell Dome

When we initially built the original 8 buildings at SRO, we choose a roll-off-roof design due to its great thermal characteristics and due to the fact that we have little to no wind issues which might require a dome design. However, dome designs remain popular and we have decided to

look at this option, especially for larger meter class telescopes. Due to their high quality and efficient design we have decided to offer Astrohaven Clamshell Observatories to those who are interested in a dome design. We are working with potential clients and you may see

these beautiful domes in the near future. As with the roll of roof designed we will make sure these are built with wooden structures at their base, to decrease any potential thermal impact.

## Our journey: SRO at a glance

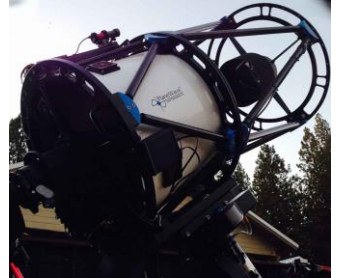
SRO has very humble beginnings. It began with three amateur astronomers who searched the Sierra Nevada Mountains for a good site for their three telescopes. Once we found our site we built, on a whim, a few extra small observatories, "just in case" someone might be interested in a space at SRO. We knew the site was a good one, the area obviously had clear skies

and little wind, was dark and relatively rainless. We knew the site was unique in being easily accessible (1 hour from the Fresno-Yosemite International Airport). But then we collected our weather and seeing data over 5 years and discovered we had 1.0 arcsecond summer seeing, 237 photometric days/year, average wind speeds of 1 mph and darkness of 21.78 magnitudes/sq arcsecond,

V band. Within a year the word was out and SRO grew. We filled the 8 original buildings and put up our first large multi-telescope building. Now we've filled this and just completed our second large building. We are even planning a few domes. Although we've grown, we at SRO are all amateur astronomers and we value providing friendly and timely support to our "family" of researchers and amateur imagers.

A few of SRO's telescopes:

iTelescope's PlaneWave 24" CDK



Mike Hankey's 12" RC



Dick Post's first 24" PlaneWave CDK



PlaneWave's 20" CDK at SRO



*"For great images you need really great seeing"*

## Astrophotography Processing Tips

Most of us have suffered from star bloating while processing our images. We end up with a nicely contrasted image with horribly bright and over processed stars. There are many ways to combat this. One method is to use Russell Croman's "StarShrink" program. Another is to use color range (or other tool) in Photoshop in order to select and then exclude stars while processing.

Begin by opening a duplicate layer and naming it "Stars". Then go to Select and choose "Color Range" and select "Highlights". Then hit OK and see your stars selected. Then under "Select" choose "modify" and then choose "expand" and expand to 4-6 and then choose feather from 3-4. (this is done to insure the star is completely covered and the edges are feathered). Now your

stars are selected. Simply go to Layer, choose "Layer Mask" and then "Hide Selection". If you alt-click while the mouse is on the mask, you will see the stars are dark (light reveals, dark conceals). Now you can again select the image and process without affecting your stars. Once completed you can keep the duplicate or blend it with the original.

## Tips and Etiquette

As everyone knows, members of SRO can enter the site at any time. Most of us are only there when working on our telescopes. Usually we are time constrained. We may have taken a few days off work and may have traveled to get there. As it gets dark and we haven't completed our work we have to use some light to get the job

done. That is fine, and we all have to do so at times. Just be sure you use the minimal light, generally red, and be careful to keep it aimed only where you need to see. Before it gets dark, be sure your car is at the end of the driveway. That way, when you leave your car's lights (hopefully only running lights) will be pointed away from SRO.

Also, please be careful to turn your monitors off when you are done. One night we heard the "Beacon of Gondor" was lit at SRO! It was a monitor which popped back on when the computer was remotely accessed.

Thanks to everyone for being considerate at SRO!

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**We're on the Web!**

[www.sierra-remote.com](http://www.sierra-remote.com)



## A BRIEF SUMMARY OF SIERRA REMOTE OBSERVATORIES

Sierra Remote Observatories (SRO) is a dedicated site for state-of-the-art robotic/remote astronomical data acquisition and imaging. We are uniquely located in the center of California's Sierra Nevada Mountains, about 50 miles south of Yosemite National park. In addition to having excellent darkness and seeing, SRO's location is unique in being within an hour of a major metropolitan area and international airport, making access to the facility and to expert personnel unusually easy. At nearly 5000 feet, on top of Bald Mountain, the site was chosen for its excellent seeing conditions and accessibility. Summer intrinsic seeing quality FWHM measure 1.0 arcsecond. The site is very dark at 21.78 magnitudes/sq arcsecond, V band. With excellent seeing, an extremely low incidence of thunderstorm activity, maximum wind gusts averaging only 10 mph, on-site services, an average of 237 photometric nights each year and easy access, Sierra Remote Observatories offers the professional scientist and amateur imager an excellent imaging location. Since first light in May of 2007, SRO has continuously operated multiple observatories for both professional research and amateur imaging.

There are 8 individual observatories which each house one or two telescopes and larger observatories which each contain 14 telescopes of various sizes, ranging from a 24" RC or CDKs, to smaller refractors. The larger observatories are uniquely designed with 9 foot ceilings, making any contact of the ceiling and telescope virtually impossible, regardless of the position of the telescope. The operation of the roof in each building is automated and will close under any adverse weather conditions and reopen when the weather improves. Custom clamshell dome observatories for 1 meter class telescopes have been designed and can be made available within 3-6 months. Machine shop services and on-site technical personnel for repairs are available.

## A Word From the Owners

We hope you've enjoyed SRO's first newsletter. They will be coming out every 4 months (triannual), giving us a chance to update everyone on what's new at SRO. The three of us (Keith Quattrocchi, Mel Helm and Larry Van Vleet) appreciate the many kind words and great work that has come out of SRO. We never imagined that APODs would be weekly events. And we never thought that serious peer reviewed studies would emerge from SRO. What we did hope was we'd find a quiet, dark and clear place to image.

That we found, and much more.

One of the most rewarding aspects of our work at SRO is getting to know all of you and seeing the remarkable work from the members. With clear skies it seems everyone becomes an advanced imager and most far surpass any skills we might collectively have.

We have focused on perfecting our infrastructure and getting the word out regarding what we offer. We have spent a lot of time with roof control, with Larry adding a great deal of

expertise in the area of programming and networking. Mel has upgraded our roof motors and has everything backed up on virtual computers. I have spent a lot of time with marketing issues. Sam, our technical expert, has done a lot to help those who need it, and is on-site whenever he's needed. Together we hope to make SRO better and better as time goes by. Most of all we want it to remain a friendly and collegial site known for its clear and dark skies.