

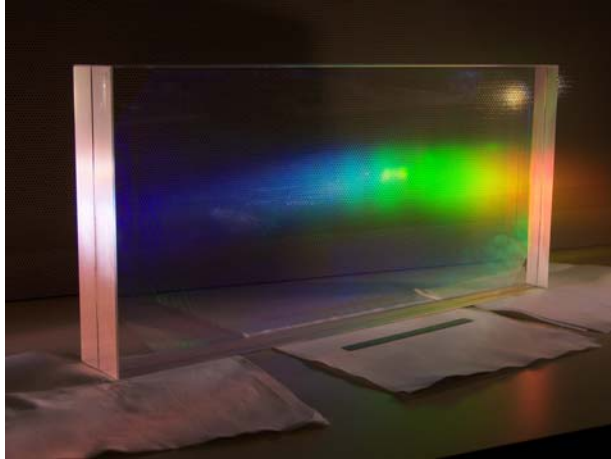


WIYN Observatory

Wisconsin Indiana Yale NOAO

Newsletter

Volume 1, Issue 1, March 21, 2006



3300 l/mm VPH grating. The peak response is at $\sim 5100 \text{ \AA}$, indicated by the green light in the image.

Bench Upgrade Report

The Bench Upgrade Project consists of three major components: (1) a new collimator design; (2) development of science-grade Volume Phase Holographic (VPH) gratings; (3) a new CCD detector for the Bench. The latter component, the new CCD detector, is not part of the originally scoped project, but has become a component with the failure of T2KC and the lack of a backup CCD for T2KA. KPNO has assumed the responsibility for the CCD and controller upgrades.

The optical design for the new collimator specifies an off-axis collimator with four optical corrector elements. The Project Scientist, Matt Bershady, has worked with Charles Harmer to converge on a design, and the over-

Continued on Page 3

QUOTA News

QUOTA is the prototype camera for testing many of the concepts and hardware components for ODI. Principal among these are the detectors (OTAs), electronics (MONSOON), active focus sensor, filter technology, software and pipeline reductions, and operations models. Roughly 60% of QUOTA was funded through a NSF grant that runs through the end of FY06. QUOTA is expected to go to the telescope at that time (September 2006), assuming that all components will be completed by then. Initially, it will be operated as a static imager, with upgrades to use the OTA features during the subsequent 6 months.

Continued on Page 3

Director's News

Welcome to the re-birth of the WIYN Newsletter! The last time Tucson staff assembled the news from WIYN was back in September 2003, 2½ years ago. We stopped producing the newsletter at that time because of the effort involved for the small staff.

Since then, WIYN and its partners have succeeded in securing external funds for 5 new instruments. These (and their project scientists) are:

- QUOTA – the prototype camera for ODI (George Jacoby)
- ODI – the One Degree Imager (Daniel Harbeck)
- WHIRC – the WIYN High Resolution Infrared Camera (Margaret Meixner)
- DSI – Differential Speckle Imager (Elliot Horch)
- FHiRE – Fiber High Resolution Echelle (Coty Pilachowski)

In all, external funding for these adds up to about \$3.5M. This new influx, combined with cash and in-kind personnel provided by the partners, has allowed WIYN to expand its staff somewhat to try to meet the demands of the projects. With that extra help comes the burden of communicating to a larger group about all the activities at WIYN. We felt that a newsletter serves that function while eventually providing a much needed informational medium for those beyond Tucson, and thereby supplanting the dormant newsletter of few years ago.

In addition to the discussions about new instruments, this newsletter also will include updates on facility improvement projects and major upgrades to existing instruments (e.g., the Bench spectrograph).

From time to time, I will have the opportunity to announce the arrival of new personnel. This newsletter, for example, is edited by Sheryl Falgout who started work about a month ago as the administrative coordinator for KPNO and WIYN. Sheryl and Kiki Atkinson fill the administrative positions vacated by Jane Price and Judy Prosser, who recently retired from KPNO after 18 years. We are sad to see Judy leave, but applaud her decision to find time for herself.

If there are particular aspects of WIYN that you would like to hear about, please let me know and we will attempt to incorporate your suggestions in the newsletter.

~George Jacoby

WIYN Telescope Report

3.5-m Operations

In order to help us keep on top of user issues that arise, Steve Howell has begun contacting observers on the last night of their run. At the same time, observers will be gently reminded to submit Observing Run Evaluation forms (OREs).

The remote observing tools have become somewhat outdated. Over the next several months efforts will be underway to improve these. WIYNRO will be revisited to determine what works, what doesn't work, and what needs to be added. Current WIYNRO users are being polled, but any feedback is useful – contact Heidi with any comments/suggestions at heidis@noao.edu.

Possible improvements or additions will be made with the help of Jeff Percival (UW). We will also be moving towards replacing RAT, making the Polycom system the consortium-wide standard.

3.5-m Instrumentation

In January, a significant amount of particulate matter was found inside and outside of MiniMo's dewar window. It was recently cleaned by Bill Ditsler and will be back in use at the end of March. Also in January, the bias and overscan levels of MiniMo appear to have changed from expected values. Observers and support personnel are asked to keep an eye on these levels as it could mean a slow failure or change in one or more electrical components.

Following the recent surprise return (and use) of OPTIC, it will soon be headed back to Hawaii. OPTIC will once again return to WIYN in May and remain here for the rest of the semester.



PREST proposal submitted requests funds to upgrade the imager for the WIYN 0.9-m

Until his departure this past December, John Feldmeier had served as backup user support at the 0.9-m. We have once again filled this position with a new hire at NOAO – James Davies. James' primary role at NOAO will be data specialist working with Letizia Stanghellini. He will begin training at the 0.9-m on March 23.

Last summer the RA and Declination drives were damaged by lightning. New motors were installed in August and have caused continued problems, mostly in Declination. After careful investigation it seems that the new motors have insufficient power. The

Continued on Page 3

WIYN Operations

Instruments

HYDRA: Overall, this instrument continues to operate at a very high level of reliability. There have been rare (once every 2-3 months) occurrences of a 'bogus status' error in the 8051 logic. Equipment has now been ordered to help Gene McDougall, *et al.* to probe deeper into the 8051's logic bus to see where this intermittent error may be occurring. We have not experienced issues with handling fibers due to this problem; however, if an error should occur while handling buttons, we will diligently inspect the gripper to be certain that no fiber is in danger.

Limitations in travel of the Z-slide (which was not replaced in the upgrade) could potentially cause dangerous handling of fibers. The problem has been addressed by removing the roller from the slide, and a permanent solution has been identified and is on order. We do not expect to replace the original slide any time soon (within the next 4-6 weeks) because the new custom slide is on order.

Computer Systems

During the April T&E, WIYN plans to replace Bone with a new ASL workstation with increased capacity. Bone is used as the central routing computer for the WIYNCS, so it is the central point for all things working at WIYN. Bob Marshall (KPMPG) will test and integrate the new system during the T&E, but be aware of the change. Use Bob (bmarshall@noao.edu) and Behzad Abareshi (babareshi@noao.edu) as points of contact for issues occurring after this change.

The WIYN-IPS computer, WIYN guider, will be replaced with the old Bone. This is to eliminate possible hardware issues with the current WIYN-IPS computer. While there is only incidental evidence that the hardware for the guider computers may be failing, we have chosen to play it safe and replace it. The old WIYN-IPS computer will become a 'hot-swappable' spare for the other linux computers at WIYN that support sub-system support.

The root password for the WIYN computers has been changed and we will update the observer and WIYN password very soon.

FSA sub-system

As you may know, the FSA filter wheel was recently re-built. The result is a more robust and accurate wheel that is far more tolerant of imbalance than the original wheel that was in service for more than 10 years. Currently, there is no spare wheel, but WIYN is working with Skip Andree to rebuild a spare on a non-urgent time line. Note that when QUOTA is brought on-line and accepted as a facility instrument, the FSA will be retired.

Inventory & Spares

WIYN is in the process of re-organizing the parts and spares. A key focus in the near future will be the re-organization of the Bench spares and VPH equipment.

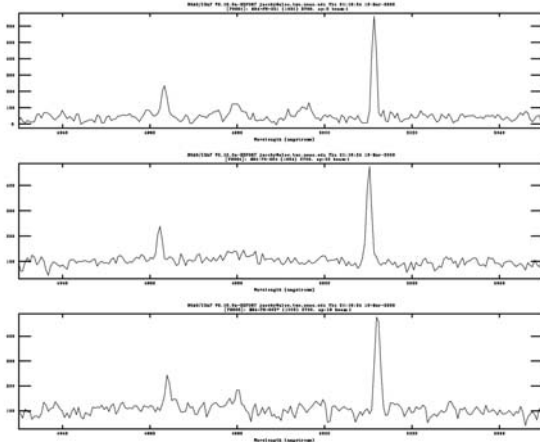
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Bench Upgrade, *cont'd from page 1*

all design concept has independently been verified at a conceptual level. The design has been undergoing initial tolerancing. It is anticipated that this design will be completed very soon, allowing us to prepare for a comprehensive review. This step is essential to allow us to proceed with the optomechanical design, and procurement of the optics.

Associated with the re-design of the collimator is the need to determine the new layout of the camera-collimator-grating-detector system on the Bench table itself. During a visit the week of 20 February 2006 by Matt Bershady, some needed measurements were made on the Bench. Matt has since completed an initial analysis using those measurements that indicates that all grating/camera configurations can be accommodated on the current Bench table, with some modifications to the rails and pads. The Bench Upgrade team will work with Charles Corson and Steve Howell to determine the best time for that work to take place.

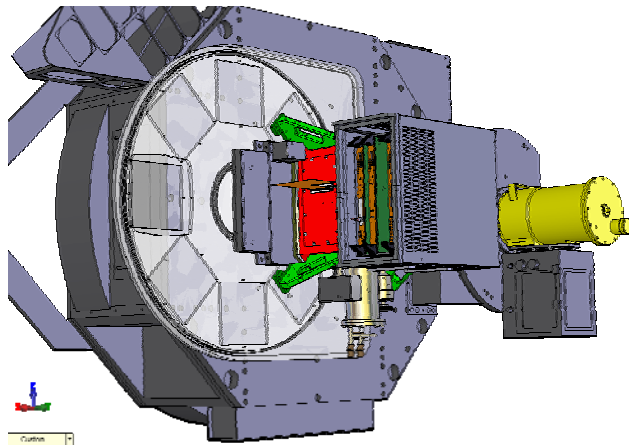
The 740 l/mm grating was used with Hydra for its third science run a couple of weeks ago. According to George Jacoby, who is collaborating with the graduate student (Kim Herrmann) who took the data, she is "thrilled" and achieving ~5 km/sec velocity resolution on planetary nebulae (PNe) that are 6 Mpc away in the galaxy M94. The figure below shows the spectra of three PNe from that run.



Spectra of three planetary nebulae in the galaxy M94 taken using Hydra with the 740 l/mm VPH

The 3300 l/mm grating arrived from CSL (see picture on Page 1), and was inspected by Gary Poczulp and Robert Upton, who accepted it for NOAO. As a result, that contract is completed. A holding fixture was designed and fabricated to allow initial testing of the grating (which is LARGE, 23x50 cm) on the Bench during the April T&E, and then safely AR coated. Matt Bershady is working on defining the coating for the grating and identifying possible vendors.

~Patricia Knezek

QUOTA NEWS, *cont'd from page 1*

QUOTA on the imaging port, with WTTM to the right.

At this time, the following parts have been delivered: dewar and Cryotiger cooling system, shutter, r' Sloan filter (prototype), and the 32-channel MONSOON controller. The following parts are scheduled for delivery within the next month: two-element corrector lenses and their mechanical cells, 8-position filter wheel, g' Sloan filter (prototype), and the r' Sloan filter (science ready).

The detectors are a key component that has not yet been demonstrated. We believe that the last attempt ("Lot 2") to fabricate the OTAs was successful, and we expect to have lab test results by the end of March from one of the first packaged detectors. Therefore, the MONSOON electronics have not been checked out with the OTAs, but should be evaluated within a few weeks.

~George Jacoby

WIYN Telescope, *cont'd from page 2*

drives have been tuned as well as possible. Solutions, workarounds, and replacements are being explored.

Over the past few years we have seen degradation with S2KB. In January, an NSF proposal was submitted to PREST (Program for Research and Education with Small Telescopes) requesting funding to purchase/build a new (4kx4k) imager. Included in the proposal was funding for additional observatory upgrades such as new telescope motors and upgraded dome rotation control. Awards for the PREST proposal should be announced in July.

~Heidi Schweiker

News Articles Wanted

Have you had an interesting experience with a WIYN telescope? Or observations you would like to share with us? We would like to hear about it.

Please contact us:

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New Student for QUOTA

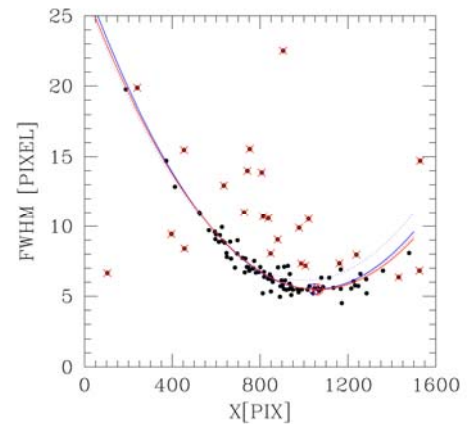
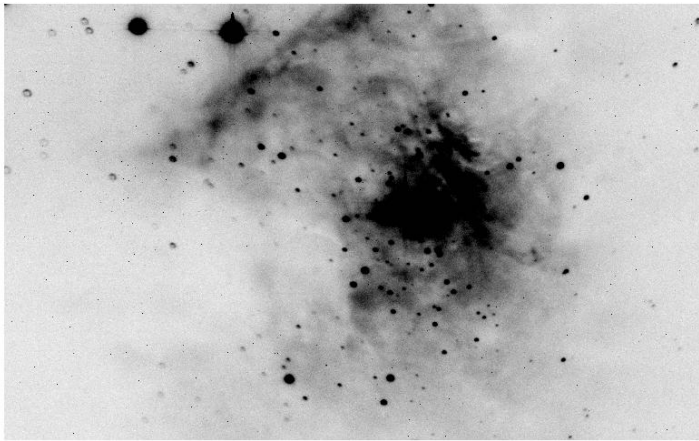


Image of the Trapezium cluster obtained at the WIYN 0.9m telescope. The CCD is tilted by 10° with respect to the focal plane, causing a focus gradient along the x-axis of the image. Note the donut-shaped stars at the left side of the image. A 2nd order polynomial with rejection allows us to reliably fit the best focus position on the chip.

We are pleased to report that the QUOTA/ODI team will be hosting an undergraduate student next summer through the KPNO REU program. Robert Nowicki from Susquehanna University will join us for three months, and will help test and implement the QUOTA/ODI focusing control loop. Robert will be the first KPNO REU student working in an instrumentation project in four years, indicating the rarity of students in this field of astronomy.

QUOTA/ODI will utilize a novel concept, where a focus CCD sensor will be mounted with a tilt relative to the focal plane. Thus stars at different locations on the chip

will have different relative focus settings. Finding the location on the chip with the best focused stars allows measuring the absolute position of the current telescope focus. With that knowledge, a control loop can apply an offset to match the telescope focus with the imaging focal plane.

This concept was tested in February at the WIYN 0.9m telescope with very promising results (see figure above). Robert will have the opportunity to implement a real-life focus control loop and test it at the 3.5m telescope during a WIYN T&E.

~Daniel Harbeck

Operations Report, *continued from Page 2*

The instrument lab is being re-organized with storage cabinets for parts and spares, some of which will be under lock and key. Your help and/or suggestions are welcomed.

Forms & Logs

We can now print our own forms and logs on either the color printer or the postscript duplex printer in the WIYN office at the facility. Staff may find this useful Heavy weight paper is kept in the printer supply cabinet, and more can be ordered. The color printer can be found on the internet by using the jet admin disk (under the printer in the cabinet) and running through the install procedure. The color printer is also attached to SNOW via USB.

Improvement Projects

Tertiary Lock Mechanism: Kitt Peak Engineering presented an informal review of the proposed new tertiary lock mechanism. WIYN has given KPENGR the go-ahead to proceed with the detailed design, including changes to the proposed design and a relaxing of the positional tolerances. The new mechanism will be targeted for installation during the August shutdown.

Dome & Facility: Facilities (John Dunlop) continues to

develop project plans to improve the dome skirt seal. We will target to enhance this seal in late spring, or possibly the August shutdown, as scheduling and resources permit.

Dome Drive: Efforts to alleviate the dome positioning difficulties at 190d have stalled (no pun intended). It is clear that no serious issue is at play and options are being considered by Facilities to resolve the problem.

The weather tower will also be changed this spring/summer to provide a reasonable ground and reorganization of instrument cables. This effort is the last step toward enhancing grounding and lightning safety.

Stray Light: WIYN's contract with Breault Research to analyze stray light performance of the facility is drawing to a close. A final report and recommendations will be provided by March 17th. From this report, efforts will focus on testing the recommendations to validate and quantify improvements. The end result will likely be more than a year away with new baffles and surfaces implemented throughout the telescope structure.

Coffee: A new grinder and coffee pot is installed and operational at the observatory. Enjoy.

~Charles Corson