**NOAO Newsletter - September 1997 - Number 51**

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## NOAO Highlights!



## Director's Office



## SCience OPErations



## Cerro Tololo Inter-American Observatory



## Kitt Peak National Observatory



## National Solar Observatory

### Global Oscillation Network Group



### US Gemini Program



### Central Computer Services




Newsletter Editorial and Production Staff


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*Comments concerning this Newsletter are welcome and will be forwarded to the appropriate editors.*
*Newsletter Posted: 29 August 1997*


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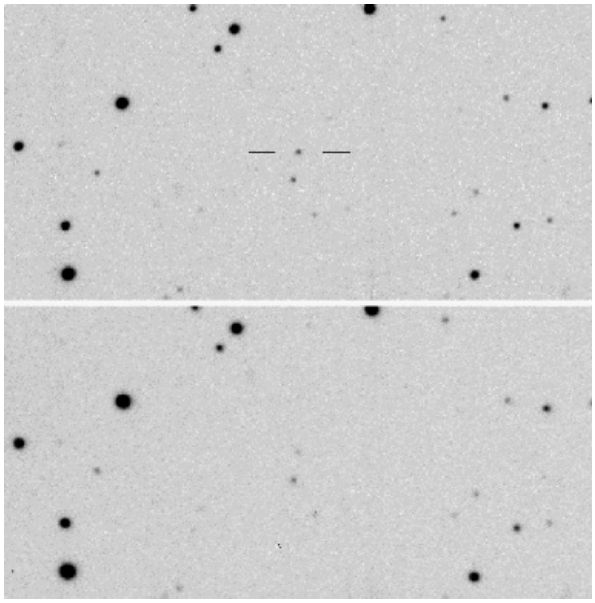
# An Optical Counterpart of a Gamma-Ray Burst

Howard Bond (STScI) used the KPNO 0.9-m to identify an optical counterpart to a gamma-ray burst (GRB), contributing to the apparent resolution of the three-decade-old debate on the distance scale of GRB sources. Bond was observing post-AGB stars in globular clusters on the evening of 8 May 1997, when Jules Halpern called from Berkeley with the news that a gamma-ray burst (GRB 970508) had been detected with the BeppoSAX satellite a few hours earlier, and that unusually accurate coordinates were already known (diameter of error box about 20'). Bond obtained the first CCD frames as soon as the sky was dark--only 5.5 hours after the burst had occurred. Because of the wide field of view afforded by the 0.9-m telescope's 2048 X 2048 chip (23' X 23'), the entire error circle could be covered in one exposure. However, comparison of these frames with images from STScI's Digitized Sky Survey disclosed no newly brightened objects down to the limit of the DSS.

On the following night, Bond obtained additional frames; in the meantime, the gamma-ray error box had moved by 7' and shrunk to a diameter of 10'. Now, by blinking the frames from the two nights, Bond immediately found a 20.5-mag star-like source near the center of the error circle which had brightened by about one magnitude since the previous night (see the figure). The discovery was communicated immediately to the Central Bureau for Astronomical Telegrams at the Center for Astrophysics.



**Caption:** Discovery images for the optical counterpart of GRB 970508, obtained with the KPNO 0.9-m telescope. These are V-band frames obtained on 10 May 1997 UT (top, 1800s exposure) and 9 May (bottom, 600s). Each frame is 138" high. The GRB counterpart is the variable source marked in the top frame, which brightened by 1 mag between 9 and 10 May.

First discovered serendipitously in the late 1960's, GRB sources are distributed isotropically across the sky. Two schools of thought have arisen on their nature, with one camp proposing that they are located in the halo of the Milky Way, and the other placing them at cosmological distances. (For summaries of the two views, see the "Great Debate" papers in the December 1995 issue of PASP.)

With an apparent optical counterpart of GRB 970508 now blazing in the sky, the race was on to obtain an optical spectrum. The following night was completely cloudy at Kitt Peak, preventing the 4-m and MDM 2.5-m observers from obtaining spectra, and the large hour angle of the object and equipment problems prevented observations at Lick Observatory. Finally, Charles Steidel and collaborators obtained a spectrum with the Keck II telescope, showing a continuum with a superposed absorption-line spectrum with a redshift z = 0.835. Assuming that the optical variable is indeed the counterpart of the GRB, this observation seems to settle the debate (setting aside the unlikely possibility that there are two classes of GRBs, one local and one cosmological).

The high-z absorption lines are attributable to an intervening galaxy or possibly to a galaxy hosting the GRB source. The 0.9-m observations show that the optical fireballs from GRBs, at maximum light, outshine supernovae by several magnitudes, making them the most luminous astrophysical objects other than QSOs. Followup observations of GRB 970508 (now fading as about $t^{-1}$) have now been obtained with the Hubble Space Telescope (which so far have not revealed a host galaxy, suggesting either that the host is intrinsically rather faint, or that the GRB source lies in the extreme halo of one of several neighboring faint galaxies). Theoretical explanations mostly involve the merger of two neutron stars.

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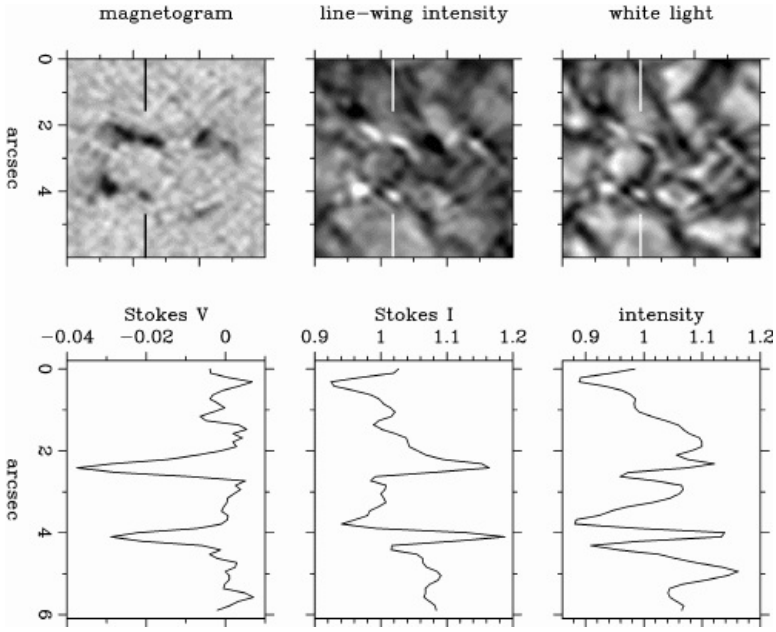
# High-Resolution Images of Solar Magnetic Fields

Christoph Keller (NSO) and Oskar von der Luehe (Kiepenheuer Institute) used speckle interferometry to obtain diffraction-limited images of magnetic fluxtubes in the solar photosphere. Magnetic elements are the fundamental structures of the solar magnetic field in plages, in active regions, and in the network along the boundaries of supergranular cells. They have a field strength of 1-2 kG in the lower photosphere and diameters ~ 100 km, comparable to the diffraction limit of the largest solar telescopes. Magnetograms at ~ 0.5" resolution have been recorded under excellent conditions, but seeing normally prevents resolution of magnetic elements. The most favored theoretical models of magnetic elements are the so-called fluxtubes. Fluxtubes appear brighter than the average photosphere, since one sees deeper and hotter layers in the partly evacuated fluxtube.

Speckle interferometric techniques can greatly improve the spatial resolution of solar observations. The speckle deconvolution technique developed by Keller and von der Luehe is able to produce diffraction-limited images of the Sun

in very narrow spectral bands by combining short-exposure images from a narrow and a broad-band channel. The broad-band images are reconstructed using a modified Knox-Thompson algorithm. By applying this technique to polarimetric observations in the wing of a Zeeman-sensitive spectral line, a few magnetic fluxtubes have been resolved in the past.

Hundreds of fluxtubes in the quiet network are now being studied with observations from the 76 cm Sacramento Peak Vacuum Tower Telescope and the Zurich Imaging Stokes Polarimeter (ZIMPOL) I, using the Universal Birefringent Filter with a bandwidth of 25 pm in the Ca I line at 610.3 nm. 300 simultaneous images in the broad-band and the narrow-band channels with a field of view of 14" X 14" were collected within less than one minute for each area. Bruce Wilton, an NSO summer student supervised by Keller, has analyzed more than 60 regions in the quiet network. Many of these magnetograms have resolution close to 0.2". The figure shows one of the areas where the size, brightness, flux, and dynamics of fluxtubes are determined, which is essential to reach an understanding of important solar phenomena such as chromospheric and coronal heating, irradiance variations, magnetic dynamos, and stellar activity in general. Preliminary results indicate that the larger elements are barely resolved. Most magnetic elements in the network seem to be brighter than the average intensity in white light at disk center, in contrast to the dark structures seen in plages at disk center.




**Caption:** A small region in the quiet network close to solar disk center. The graphs on the bottom correspond to cuts across the images as indicated by the white and black lines in the images at the top. The intensity structures in the line wing are comparable to images obtained in the G band. In the magnetogram, grey corresponds to no magnetic signal.

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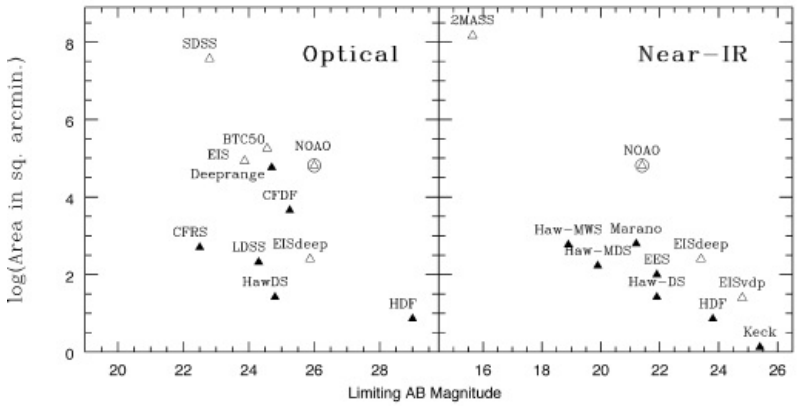
## The NOAO Deep Wide-Field Survey

A large group of NOAO staff members and collaborators is undertaking a deep optical and near-infrared wide-field imaging survey that will sample two 9 square degree regions of the sky. This *NOAO Deep Wide Field Survey* is designed to investigate the existence and evolution of large scale structures at redshifts z > 1 as sampled by a diverse set of objects, but its depth and area coverage will be suitable for a a diverse set of astronomical problems. A key goal is to provide the astronomical community a sensitive multicolor-database of objects from which samples may be selected for future study. This is motivated by the anticipated commissioning of the Gemini Telescopes before the end of this millennium, which will provide the astronomical public with an efficient array of instrumentation to investigate both the local and the distant Universe.




**Caption:** Comparison of the NOAO Survey with recent and proposed surveys of the sky. Optical and near-IR surveys are shown in the left and right panels respectively, based on information available as of 1 August 1997. BTC50 = ongoing survey of Falco et al; CFRS = Canada France Redshift Survey; CFDF = Canada France Deep Fields (Lilly et al); Deeprange = Postman et al deep I-band survey; EES = IR imaging survey of Elston, Eisenhardt & Stanford; EIS(deep,vdp) = ESO Imaging Survey and its deeper complements; Haw-XXX = various Hawaii surveys ( e.g., Gardner 1995); HDF = Hubble Deep Field; LDSS = surveys of Glazebrook et al. (1995) and Colless et al. (1990, 1993); Marano = Marano Field survey (e.g., Grupponi et al. 1997); SDSS = Sloan Digital Sky Survey. The survey detection thresholds (in a 2" dia. apt.) are represented in AB magnitudes for the deepest band. Completed surveys are represented by filled triangles and those planned or in progress by open symbols. Of the many Hawaii K-band surveys, three representative ones are plotted. The pioneering LDSS, AutoFib, CFRS and Hawaii surveys all cover areas of < 600 square-arminutes and were generally limited to magnitudes brighter than B = 24. The NOAO survey will occupy a unique region of parameter space, providing both optical and IR coverage over a large area to unprecedented depth in the optical bands.

The survey begins in the second semester of this year, and will cover two regions of sky: the second semester 1997 field is a 2 X 4.5 equatorial strip centered on RA = 2h 10m, DEC = -4 30' (J2000), roughly 30 degrees from the South Galactic Pole; the first semester 1998 field will be a 3 X 3 degree region in an area (still to be finalized) roughly near the North Galactic Pole. The fields were selected because of their low IRAS cirrus emission, low NHI, and the eventual public availability of radio data from the FIRST VLA Survey for these fields. The equatorial field has $f_{100\mu m} < 1.4 MJy/sr$, $N_{HI} \approx 1.75 \times 10^{20} cm^{-2}$, corresponding to E(B-V)<0.04. This field is also only 15 from the ecliptic, allowing a search for Kuiper belt objects.

We plan to observe each region to the depths specified in Table 1 using the MOSAIC camera at the KPNO Mayall Telescope and the BTC at the CTIO Blanco Telescope for the optical observations; and the ONIS camera at the KPNO 2.1-m for the near-infrared observations. The optical survey depths (see Table 1) were selected to allow detection of an L* star-forming galaxy at $z \gtrsim 3.5$. The IR imaging depths were selected to detect an "unevolved" L* elliptical galaxy at z = 1.5, and passively evolving luminous systems to z = 2. The planned depth will also permit the study of the Galactic halo stellar populations, the coolest high-latitude white dwarfs to ~ 1.5kpc, young (bright) field brown dwarfs (like GL229B) to ~ 75pc, distant supernovae, and distant radio sources.

We are committed to maximizing the scientific return of the survey by engaging the intellectual resources of the astronomical community in the analysis and follow-up of the survey. To make this possible we will make the data and object catalogs publicly available on a rapid time-scale in an easily accessible format. This will allow everyone to benefit from the survey and to make use of the survey data for their own projects. NOAO provides an excellent set of ground-based facilities for the execution of a public project of this scope. Several large wide-field imaging telescopes, the availability of the necessary wide-field imaging instruments (ONIS and eventually the upgraded SQIID, the BTC, provided by Tyson and Bernstein, and the MOSAIC), computing resources for data-reduction, the technical expertise (hardware, software, and computer support) provided by the NOAO staff, and NOAO's orientation toward service to the community make NOAO an ideal institution to carry out such a project.

**Detection Limits In Each Band**

| Band | 5s Detection in 2" aperture AB mag | 5s Detection in 2" aperture Vega-mag | 1s surface brightness limit per sq-arcsec AB mag | 1s surface brightness limit per sq-arcsec Vega-mag |
|---|---|---|---|---|
| B | 26.6 | 26.9 | 9.0 | 29.3 |
| R | 26.0 | 25.8 | 28.4 | 28.2 |
| I | 26.0 | 25.5 | 28.4 | 27.9 |
| J | 21.0 | 20.2 | 23.4 | 22.6 |
| H | 21.0 | 19.6 | 23.4 | 22.0 |
| K | 21.4 | 19.5 | 23.4 | 21.9 |

Buell Jannuzi, Arjun Dey, Tod Lauer

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# 1.3-m Kitt Peak Telescope Seeking New Home

NOAO expects to make the 1.3-m telescope on Kitt Peak available to a new operating group sometime in the next few months. While the details of the process of awarding the telescope to a new group must be worked out with the NSF, it is likely that formal proposals will be required and that these proposals will be reviewed and evaluated by an external committee of referees. The goal of this Newsletter article is to describe the telescope in sufficient detail that interested groups can begin thinking about the nature of the proposal that they will submit.

The criteria for evaluating proposals to operate the 1.3-m remain to be determined but are likely to include the science programs to be pursued with the telescope; the plans for refurbishing it and placing it into service; the plans for instrumentation; whether or not any time or data (from, e.g. planned surveys) would be made publicly available; the experience of the proposing group; and the soundness of the plan for funding refurbishment and operations. In principle, we are open to a variety of options for continued operation of the 1.3-m, including operation in place, transfer to a new site, and "leasing" the telescope for a fixed period of time for a specific scientific purpose.

The telescope itself has a 1.3-m primary and f/13.5 and f/15 foci and has traditionally been used primarily for infrared and optical photometry. The low-background f/15 chopping secondary is slightly undersized, filling 123 cm of the 127 cm nominal primary diameter. Chopping to 300" off axis is possible, and the approximate plate scale is 11.34"/mm. The conventional fixed secondary at f/13.5 offers a plate scale of 11.7"/mm and a field-of-view of 20'.

The primary and secondary baffles are easily removed for low-emissivity IR work. A reflective cone in the center of the secondary eliminates radiation from the central hole in the primary. The image quality is not well established, but the best reported image quality with the chopping secondary is 1.4" and with the fixed secondary is 1.1". These numbers are upper bounds because no record of seeing is available, and the telescope was normally used with pixels too large to sample the point spread function properly.

The maximum load capacity of the telescope is 200 kgm at a center-of-gravity 52 cm from the mounting surface at the back of the telescope.

No instrumentation or computers will be supplied with the telescope. All spares, equipment, and ancillaries specific to the telescope itself will be made available (e.g. alignment fixtures, spare electronics for the chopping secondary, etc.)

The current telescope control system is the KPNO FORTH-based system running on a DEC PDP 11/44 computer. It was in working condition when the telescope was last used (February 1996), but we recommend that the TCS be replaced with a system based on off-the-shelf components.

The pointing performance depends slightly on telescope loading. The most recent measurements yielded RMS pointing in both RA and Dec of 13" (for 18 stars and hour angles up to three hours and declinations from + 60 to - 30) with a maximum error of 24" and a minimum error of 5". The telescope is equipped with both incremental and absolute encoders. The absolute encoders are sufficiently coarse that the finder telescope must be used to acquire the first star of the night when the power has been turned off. Telescope settling time after a slew is 1-3 seconds.

People interested in additional information, such as approximate operating costs on Kitt Peak and drawings of the optical configuration and bolt pattern for Cassegrain instruments should contact the undersigned. The formal announcement of opportunity will be made later this year via this Newsletter, the NOAO Web distribution list, and the AAS Newsletter.

Sidney C. Wolff

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# A KPNO REU Summer Student Goes to Washington

Nothing more effectively demonstrates the value of the Federally funded undergraduate research programs than the words and stories of the students that have participated in these programs. In order to share the experiences of the students with members of Congress, the Council on Undergraduate Research (CUR) hosted an undergraduate poster session on Capitol Hill on 10 April 1997. This event gave members of Congress the chance to observe the impact of undergraduate research programs by talking directly with the students involved in the various programs supported by the government, including the Research Experiences for Undergraduates (REU) program which is funded by the National Science Foundation.

I was selected to be one of the students presenting my research in the poster session as a result of my involvement in the REU program at Kitt Peak National Observatory. I took my poster and a list of my Congresspeople from Illinois with me to Capitol Hill. My poster, titled "Dating the Surface of Ganymede using Images from the Galileo Spacecraft" and the result of work over the 1996 summer at NOAO with Mike Belton and Elizabeth Alvarez del Castillo, was one of forty different projects from almost as many different disciplines presented during the poster session. It drew considerable attention due to the Europa press conference the day before the poster session.

It was a very good event in a number of ways. I know that my understanding of the way in which government functions was elevated and I have new respect for the process. Even though it is difficult to gauge what kind of influence our event had on the way in which our Congresspeople will vote, I believe that we made a positive impact in ensuring that Members of Congress understand the importance of undergraduate research to the undergraduates involved, the education programs of academic institutions, and the Nation. I am very glad that I was able to participate and would like to thank both the National Optical Astronomy Observatories and the Department of Astronomy at the University of Illinois for sponsoring my trip.

In addition to our presence in Washington at this time prior to science funding decisions, we also left behind a document that might serve to keep undergraduate research experience on the front burner. Below is the statement that the fifty-eight students signed and left with all the people that we visited.

Ross Beyer, 1996 Summer Research Assistant in the
Research Experiences for Undergraduates Program at KPNO

**An Investment In Tomorrow**

*We, the undersigned college and university undergraduate students, have come to Washington from across the United States to ask Members of Congress and the White House to continue to invest in this Nation's future. In the new millennium, our economic competitiveness, medical health, national security and quality of life will depend on how wisely we invest today in research and in those who will replace the current generation of scientists. Just as craftsmen have for centuries passed along their skills and knowledge to apprentices who worked by their sides, we ask that this Nation provide its science students with this important hands-on training to ensure that today's scientists pass along their laboratory and analytic skills to those who will follow in their footsteps.*

The National Science Foundation's Research Experiences for Undergraduates, the Department of Energy's University and Science Education program, and the National Aeronautics and Space Administration's Space Grant program are some examples of federal initiatives that provide these important hands-on learning opportunities both on our campuses and at our national laboratories. Each of us is convinced that because our undergraduate research experience has helped us better learn how to pose questions, gather data and make reasoned judgments, and to use sophisticated technologies in coming to answer questions of national interest, we will be better able to contribute to the work force and as citizens in the next century.

On behalf of all students, we encourage Members of Congress and the White House to continue, and where possible, to increase the funding for programs that provide undergraduate research opportunities so that more students can have the kind of valuable education experience we have received.

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# NOAO Educational Outreach

Co-investigators Suzanne Jacoby (NOAO), Jeff Lockwood (Sahuaro High School) and Don McCarthy (Steward

Observatory) are working now with ten teachers from Tucson in the first-year Pilot Program of ***The Use of Astronomy in Research Based Science Education***, a Teacher Enhancement Program funded through the National Science Foundation's Directorate for Education and Human Resources. About thirty NOAO staff members are joining in the effort to help teachers implement a scientific research component to their classrooms. Program participants this year are:

- Making daily solar observations, building a solar viewing device, and becoming familiar with the interpretation of magnetograms from the NSO/Kitt Peak Vacuum Tower telescope.
- Observing on Kitt Peak for a total of 12 telescope nights, monitoring active galaxies for spectral variations and searching local group galaxies for novae.
- Working with Richard Greenberg and the Image Processing for Teaching (IPT) program staff to analyse digital data using NIH Image software.
- Job shadowing NOAO staff to become familiar with the large number of interesting jobs in science and technology that don't require a PhD.
- Developing plans to put it all together and extend the experience to their classroom in the next academic year with datasets provided by NOAO telescopes on Kitt Peak.

As I write this we are in the second week of the four week program. The pace is hectic with half the group observing on Kitt Peak and the other half stationed downtown for IPT training and instrument building; the groups switch places in week three. The summer skies have cleared and two sunspot groups have appeared at last on the quiet Sun. Two teachers have persuaded their principals to support them in their efforts to add a research component to existing science classes. Many ways in which our program can be improved for future years are becoming apparent. In future years, teachers will be recruited nationally and require the support of a local astronomer mentor. Opportunities for your involvement will be described in a future article as the efforts of our Pilot Program are evaluated.

Suzanne Jacoby,
NOAO Education Officer

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# NOAO Preprint Series

The following preprints were submitted during the period 1 May to 31 July 1997. Please direct all requests for copies of preprints to the NOAO author marked with an asterisk.

744 *Ajhar, E.A., Lauer, T.R., Tonry, J.L., Blakeslee, J.P., Dressler, A., Holtzman, J.A., Postman, M. "Calibration of the Surface Brightness Fluctuation Method for Use with the Hubble Space Telescope"

745 Malhotra, S., *Rhoads, J.E., Turner, E.L. Through a Lens Darkly: Evidence for Dusty Gravitational Lenses"

746 *Pilachowski, C., Sneden, C., Hinkle, K., Joyce, R. "Carbon Isotope Ratios from the First Overtone CO Bands in Metal Poor Giants"

747 *Smith, P.S., Schmidt, G.D., Allen, R.G., Hines, D.C. "HST and Ground-Based Observations of I Zw 1 and Mrk 486 and the Variability of Polarization in Radio-Quiet AGNs"

748 Yanny, B., *Jannuzi, B.T., Impey, C. "HST Imaging of the BL Lacertae Object OJ 287"

749 *Layden, A.C., Sarajedini, A. "The Globular Cluster M54 and the Star Formation History of the Sagittarius Dwarf Galaxy"

750 Burkholder, V., *Massey, P., Morrell, N. "The "Mass Discrepancy" for Massive Stars: Tests of Models Using Spectroscopic Binaries"

751 Laor, A., *Jannuzi, B.T., Green, R.F., Boroson, T.A. "The UV Properties of the Narrow Line Quasar I Zwicky 1"

752 *Jannuzi, B.T., Yanny, B., Impey, C. "HST Imaging of the Host Galaxies of Three X-Ray Selected BL Lacertae Objects"

753 *Dey, A., van Breugel, W., Vacca, W.D., Antonucci, R. "Triggered Star Formation in a Massive Galaxy at z=3.8: 4C 41.17"

754 *Joyce, R.R. "Infrared Spectroscopy of Faint High Galactic Latitude Carbon Stars"

755 *Vukobratovich, D., Gerzoff, A., Cho, M.K. "Therm-optic Analysis of Bi-metallic Mirrors"

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## Other NOAO Papers

Preprints that were not included in the NOAO preprint series but are available from staff members are listed below.

Eggen, O.J. "Red Horizontal Branch and Early Asymptotic Stars Near the Sun"

Feldmeier, J.J., Ciardullo, R., *Jacoby, G.H., "Planetary Nebulae as Standard Candles. XI. Application to Spiral Galaxies"

Ferguson, J.W., Korista, K.T., Baldwin, J.A., Ferland, G.J. "Locally Optimally-emitting Clouds and the Narrow Emission Lines in Seyfert Galaxies"

Izotov, Y.I., Foltz, C.B., *Green, R.F., Guseva, N.G., Thuan, T.X., "I ZW 18 - A New Wolf-Rayet Galaxy"

Korista, K., Ferland, G. Baldwin, J. "Do the Broad Emission Line Clouds See the Same Continuum That We See"

Lira, P., Suntzeff, N.B., Phillips, M.M., Maza, J., Hamuy, M., Smith, R.C., Wells, L., Schommer, R., Aviles, R, Navarrete, M., Gonzalez, L., Rehner, L., Siciliano, L., Tyson, N.D., Rich, R.M., Williams, T. B., Elias, J., Roth, J., Crotts, A., Ugarte, P., Dey, A., Hibbard, P., Guhathakurta, P., Baldwin, J.A., Williger, G., Walker, A., Layden, A., Seitzer, P., Kim, Y. "Optical Light curves of the Type Ia Supernovae 1990N & 1991T"

Marlowe,A.T, Muerer, G. R., Heckman, T. M., and Schommer, R. "The Taxonomy of Blue Amorphous Galaxies: I, Ha and UBVI Data"

*Rhoads, J.E., "How to Tell a Jet from a Balloon: A Proposed Test for Beaming in Gamma Ray Bursts"

John Cornett, Suzan Ecker,
Elaine Mac-Auliffe, Jane Marsalla,
Shirley Phipps, Cathy Van Atta

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## Proposals Go to NOAO, Not CTIO or KPNO

For the first time, NOAO is soliciting proposals for telescope time at CTIO and KPNO using a uniform process and proposal form. Rather than submitting proposals to individual sites, proposals should be submitted to NOAO directly, using either our new Web proposal form or the new LaTeX template (see the in the Newsletter for details).

Centralizing the proposal submission process reduces the work of maintaining two separate and slightly different installations of the LaTeX template, style files, and code that processes proposals. We also hope that investigators will

find it easier to find current proposal information and forms if they only need to check a single source.

Proposals received at NOAO will be sorted and sent on to KPNO or CTIO as indicated in the proposal. Be sure to designate to which observatory your proposal should be directed. Following a CTIO tradition, proposals will be assigned running numbers beginning at 0001 each semester, with CTIO and KPNO proposals intermixed. You will receive by return email your proposal number after it is submitted. For proposals submitted via email, this proposal number must be used to submit any figures included in the proposal. Proposal numbers of active, long-term proposals will be reserved until the program is completed.

Once proposal submission is complete, the proposals will be handled in the usual way at each NOAO site. At present, CTIO and KPNO will continue to operate independent Telescope Allocation Committees.

If you have questions about submitting proposals for time on NOAO's nighttime telescopes, you can find help by sending email to noaoprop-help@noao.edu.

Caty Pilachowski
for the SCOPE Proposal Team

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# New Observing Proposal Submission Procedures

Proposals for observing time at Cerro Tololo Inter-American Observatory and Kitt Peak National Observatory should now be submitted to NOAO-Tucson. As mentioned in an accompanying article in this section of the Newsletter, a new SCience OPErations Division has been formed at NOAO--one of its duties is processing observing proposals for the NOAO nighttime programs.

Investigators now have three ways to submit observing proposals:

1. NOAO is now accepting proposals through the Web at http://www.noao.edu/noaoprop/. Information is entered on a series of Web forms, and is then formatted and submitted as a LaTeX file along with any Encapsulated PostScript figures that are "attached" to the Web proposal. Documentation, including a short LaTeX guide, is provided online.

2. Proposals may be submitted by email to noaoprop-submit@noao.edu using a LaTeX template and style file. The files necessary for building the proposal are available from our anonymous FTP archive at ftp.noao.edu in the noaoprop directory. A README file is part of the distribution files and contains information necessary to complete the proposal. These files have been modified from those used during the last proposal period, so please be sure to get the new files. A subset of the files can also be obtained by sending email to noaoprop-request@noao.edu.

3. Proposals are still being accepted on paper, but investigators should be aware that this type of submission has an earlier deadline (see the accompanying article in this section of the Newsletter). A blank proposal form may be requested from the NOAO Proposal Office, SCience OPErations Division, National Optical Astronomy Observatories, P.O. Box 26732, Tucson, AZ 85726-6732 (US mail) or 950 North Cherry, Tucson, AZ 85719 (overnight). A blank proposal form is also available from our FTP archives, mentioned above, as the file blank.ps. The completed proposal form should be sent to the NOAO Proposal Office at one of the addresses given above.

If you have questions about or problems with NOAO's submission procedures, please contact us at noaoprop-help@noao.edu. We will respond as quickly as we can to help you.

Todd Boroson

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# Modifications to the LaTeX Observing Proposal Template

There are several changes to the LaTeX template and style file for observing proposals for time in the first semester of 1998:

- There is now a common template and style file for CTIO and KPNO.
- Investigators need to select within the template to which of either CTIO or KPNO they are applying for time. Do not mix proposals for CTIO and KPNO on the same proposal form--separate proposals are necessary.
- A separate WIYN-queue form for WIYN investigators is no longer available. Instead, WIYN Hydra and/or WIYN Imager tables are now required as part of the standard template in the section called Target Tables, if you are applying for WIYN time.
- The new Target Tables section may be used for general tables that have previously been coded in the Feasibility section.

Jeannette Barnes, Dave Bell,
Caty Pilachowski, Ron Probst

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**NOAO Newsletter - SCOPE - September 1997 - Number 51**

# Submitting Observing Proposals By the Web

You can now prepare and submit observing proposals by the Web, starting with this observing period. We hope our users will find the new Web version easier and faster to use than delving into a LaTeX template.

LaTeX is still used to format proposals submitted through the Web. Information provided on the Web forms is used to construct a LaTeX proposal, using the same LaTeX template and style files that you would use for submitting a proposal by email. LaTeX symbols and math mode are thus acceptable input. Proposals submitted through the Web will therefore produce similarly formatted paper copies for review by the Telescope Allocation Committee.

Each proposal has a unique identification name for your proposal and password supplied by you to protect it. Each time that you log on to work on your proposal you may retrieve what you have already done by typing in the id/password associated with the proposal. You can share your id/password with collaborators so you can work jointly on the same proposal. The Web proposal form has many features:

- All proposal information entered is stored locally at NOAO and can be accessed at any time by supplying the correct id/password.
- You can duplicate proposals already prepared using the Web to make a new copy. Thus you can send similar proposals to KPNO and CTIO without having to reenter redundant information. You can also resubmit a similar proposal each observing period without having to start over each time.
- Options are available to run LaTeX and dvips on the proposal - LaTeX errors are reported back in a format that allows you easily to find them on the form so they can be fixed.
- There is a spell checker for the essay-type fields of the proposal.
- There is a "check proposal" option that checks the information that has been entered and tells you what is missing.
- The PostScript version of your proposal can be viewed to be sure the proposal looks the way you expect it to appear.
- Options are available to have both the LaTeX and PostScript versions of the proposal emailed back to you.
- Encapsulated PostScript figure files can be "attached" to your proposal through your Netscape browser--the figures are then formatted to appear at the end of the Justification section of the proposal. Up to three EPS files are allowed.
- The essay-type sections of the proposal may also be provided by means of "attached" files through your Netscape browser or you may enter this information directly on the form.

The Web forms work best under Netscape 2.0 or later although they can probably be used with Internet Explorer if you do not need the "file attachment" option to prepare your proposal. If you have figures (up to three) to include with your proposal you will need to use Netscape since figures must be "attached;" they can not be submitted separately.

If you cannot submit your observing proposal using the Web form because of some problem with your figures, you can still use the Web form to prepare your proposal, have the LaTeX version emailed back to you, and then, after modifying the LaTeX file to include your figures, submit your proposal by email to the standard address noaoprop-submit@noao.edu.

**Important Electronic Addresses for NOAO Observing Proposals**

```
Web-based proposal form:
     http://www.noao.edu/noaoprop/

FTP archive for LaTeX files:
     ftp.noao.edu, cd noaoprop

Email address for automatic retrieval of necessary LaTeX files to
prepare a proposal:
     noaoprop-request@noao.edu

Address for submitting your LaTeX proposal by email:
     noaoprop-submit@noao.edu

Help from a person for proposal preparation:
     noaoprop-help@noao.edu

Site-specific questions related to an observing run:
     ctio@noao.edu and kpno@noao.edu

Email address for thesis and visitor instrument letters:
     noaoprop-letter@noao.edu
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Caty Pilachowski, Jeannette Barnes,
Dave Bell, Ron Probst

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# Paper Proposals Due One Week Early

Since e-mail proposal submission was implemented, we have seen a rapid shift away from paper. Last semester, only two KPNO proposals were not received in electronic form. Because our database is set up to handle electronic proposals quickly and easily, entry of paper proposals now requires significant extra work. While we don't want to exclude people who positively, absolutely cannot submit proposals electronically from applying for telescope time, we do need extra time to process such proposals. Starting with proposals for time in the first semester of 1998, we require that proposals submitted on paper, rather than over the Web or by e-mail, arrive at least one week early. Proposals submitted on paper must be received by 5:00 PM on Tuesday, 23 September, to be considered for telescope time in the first semester of 1998. This applies to proposals for both KPNO and CTIO. Proposals submitted on paper may be sent to the NOAO Proposal Office, SCience OPErations Division, National Optical Astronomy Observatories, P.O. Box 26732, Tucson, AZ 85726-6732 (US mail) or 950 N. Cherry, Tucson, AZ 85719 (overnight). Proposals submitted via the Web or by e-mail must arrive by the usual deadline of midnight on 30 September.

Todd Boroson

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# CTIO Proposals Are Now In The Database

As those of you who applied for telescope time at Kitt Peak for the second semester of 1997 may have already noticed, our new ALPS++ proposal database is up and running! As proposals arrive, we are able to process the LaTeX files and to import proposal information into the database. The database then can be used to generate competition lists for the Telescope Allocation Committee, to enter scheduling information, and to print letters and TAC comments to send back to investigators. The database also sends schedule information to the Web, so we can post the new telescope schedule quickly. We continue to add new features to the database to assist with receiving and reviewing proposals, scheduling telescopes, generating reports and statistics, and supporting your observing runs.

Over the next month, we will be installing the database system at CTIO and customizing the system for use by CTIO staff. Users of NOAO's southern hemisphere facilities (and the CTIO TAC) will then see the same format of reports.

Caty Pilachowski
for the SCOPE Proposal Team

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# CTIO Instruments Available

The following lists common user instruments available on CTIO telescopes. The last column gives volume number of Newsletters containing relevant articles. Many optical instruments show a "generic" CCD, e.g. "Tek 2K." The most recent summary of specific CCD characteristics is in NOAO Newsletter 45; see also 51,50, and 33.

**SPECTROSCOPY**

| | Detector + Spectral Range | Resolution | Slit | Reference |
|---|---|---|---|---|
| **4-m Telescope** | | | | |
| OSCIR 10 m | | | | |
| Spectrometer | $128^2$ Si:As BIB, 8-14 m | 40-1000 | 23" | [51] |
| ARGUS Fiber-Fed | | | 24 Fiber | |
| Spectrograph | Loral 3K CCD, 3900-10000 | <8000 | pairs | [40,41,42,45,51] |
| ARGUS Echelle | | | 24 Fiber | |
| Fiber-Fed Spect. | Loral 3K CCD, 3900-10000 | 16000 | pairs | [40,41,42,45] |
| R-C Spectrograph | Loral 3K CCD, 3100-11000 | <8000 | 5.7' | [40,41,42] |
| Blue Air Schmidt + | | | | |
| Echelle Spectrograph | Loral 3K CCD, 3100-11000 | <20000 | 5.7' | [40,41,42,50,51] |
| Folded Schmidt + | | | | |
| Echelle Spectrograph | Tek 1K CCD, 3800-11000 | <20000 | 5.7' | [22,23,25,26,50,51] |
| Long Cameras + | | | | |
| Echelle Spectrograph | Tek 2K CCD, 3100-11000 | <45000 | 5.7' | [23,25,26,39,5,50,51] |
| CTIO IR Spectrometer | InSb ($256^2$, 0.9-5 m) | 450-9800 | 0.3' | [37,39,41,45,49,51] |
| Rutgers Imaging | | | 2.7' | |
| Fabry-Perot | Tek 1K/2K CCDs, 4800-9600 | 3000-8000 | FOV | [25,26,42] |
| **1.5-m Telescope** | | | | |
| Cass spectrograph | Loral 1200800 CCD, 3100-11000 | <1300 | 7.7' | [43,45] |
| Bench Mounted | | | | |
| Echelle Spectrograph | Tek 2K CCD, 3100-8800 | 15000-60000 | Fiber | [22,23,39,42,50,51] |
| Rutgers Imaging | | | 7.3'/ 4.1' | |
| Fabry-Perot | Tek 1K/2K CCDs | 0.97-0.36 | FOV | [25,26,42] |
| **Curtis Schmidt** | | | | |
| Objective Prism | | | | |
| Imaging | STIS 2K CCD, 3100-11000 | <900 | NA | [42,47,50,51] |

**IMAGING**

| | Detector | Scale ("/pixel) | Field | Reference |
|---|---|---|---|---|
| **4-m Telescope** | | | | |

| | | | | |
|---|---|---|---|---|
| OSCIR 10 m Imager | Si:AS BIB ($128^2$, K + 8-21 m) | 0.18 | 23" | [51] |
| BTC Mosaic Imager | 4K x 4K CCD Mosaic | 0.43 | 30' | [47] |
| Prime Focus Camera | Tek 2K CCD | 0.43 | 14.7' | [36,39,50,51] |
| Prime Focus Camera | User Photo-Plates | | 50' | [23,38,41] |
| Cass Direct Imaging | Tek 2K CCD | 0.16 | 5.4' | [39,50,51] |
| Cryogenic | | | | |
| Optical Bench | InSb ($512^2$, 1-3 m) | 0.094 | 0.8' | [45,47,49] |
| CTIO IR Imager | HgCdTe ($256^2$ 1-2.5 m) | 0.4 | 1.7' | [40,41] |
| | | | | |
| **1.5-m Telescope** | | | | |
| Cass Direct Imaging | Tek 1K/2K CCDs | 0.44/0.24 | 14.8'/8.2' | [39,50,51] |
| CTIO IR Imager | HgCdTe ($256^2$, 1-2.5 m) | 1.16/0.64 | 4.9'/2.8' | [40,41] |
| ASCAP Optical | | | | |
| Photometer | | | | [24,25,28,43] |
| | | | | |
| **0.9-m Telescope** | | | | |
| Cass Direct Imaging | Tek 2K CCD | 0.40 | 13.6' | [39,50,51] |
| | | | | |
| **Curtis Schmidt** | | | | |
| Direct Imaging | STIS 2K CCD | 2.0 | 68' | [42,47,50,51] |

Ron Probst

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# KPNO Instruments Available

### SPECTROSCOPY

| | Detector* | Resolution | Slit | Multi-object |
|---|---|---|---|---|
| **Mayall 4-m Telescope** | | | | |
| R-C CCD Spectrograph (RCSP) | T2KB CCD | 300-5000 | 5.4' | single/multi |
| CCD Echelle Spectrograph | | | | |
| (ECH) | T2KB CCD | 18,500-65,000 | 2.0' | |
| IR Cryogenic Spectrometer | | | | |
| (CRSP) | InSb(256256, 0.9-5.5m) | 300-1500 | 0.8' | |
| CryoCam (CRYO) | Loral CCD (8001200) | 400-600 | 4.5' | single/multi |
| Imaging Spectrometer (ONIS) | InSb(5121024, 0.9-2.5m) | 1400 | 1.5' | |
| High Resolution IR Spectro- | | | | |
| meter (Phoenix; PHX) | | | | |
| (see note 1) | InSb(2561024, 0.9-5.5m) | 50,000-100,000 | 0.5' | |
| | | | | |
| **WIYN 3.5-m Telescope** | | | | |
| Hydra + Bench | | | | |
| Spectrograph (HYDR) | T2KC CCD | 700-22,000 | NA | 100 fibers |
| DensePak (see note 2) | T2KC CCD | 700-22,000 | IFU | ~90 fibers |
| | | | | |
| **2.1-m Telescope** | | | | |
| GoldCam CCD | | | | |
| Spectrograph (GCAM) | F3KA CCD | 300-4500 | 5.2' | |
| IR Cryogenic | | | | |
| Spectrometer (CRSP) | InSb(256256, 0.9-5.5m) | 300-1500 | 1.3' | |
| High Resolution IR Spectro- | | | | |
| meter (Phoenix; PHX) | | | | |
| (see note 1) | InSb(2561024, 0.9-5.5m) | 50,000-100,000 | 1.0' | |
| OSU-NOAO Infrared Imaging | | | | |
| Spectrometer (ONIS) | InSb(5121024, 0.9-2.5m) | 1400 | 3.0' | |
| | | | | |
| **Coude-Feed Telescope** (see note 3) | | | | |
| Coude CCD Spectrograph | | | | |
| (CF; CAM5 or CAM6) | F3KB CCD | 2200-250,000 | 3.0' | |

**IMAGING**

| | Detector | Spectral Range | Scale ("/pixel) | Field |
|---|---|---|---|---|
| **Mayall 4-m Telescope** | | | | |
| Prime Focus CCD camera (PF) | T2KB CCD | 3300-9700 | 0.42 | 14.2' |
| IR Imager (IRIM) | HgCdTe (256x256, 1-2.5m) | JHK + NB | 0.60 | 2.5' |
| CCD Mosaic (MOSA) (see note 4) | 8Kx8K | 4500-9700 | 0.26 | 35.4' |
| OSU-NOAO Infrared Imaging Spectrometer (ONIS) | InSb (5121024, 0.9-2.5m) | JHK | 0.18/0.09 | 3'x1.5'/1.5'x0.75' |
| **WIYN 3.5-m Telescope** | | | | |
| CCD Imager (WIYN) | S2KB | 3300-9700 | 0.197 | 6.7' |
| **2.1-m Telescope** | | | | |
| CCD Imager (DIR) | T1KA | 3300-9700 | 0.305 | 5.2' |
| IR Imager (IRIM) | HgCdTe (256256, 1-2.5m) | JHK + NB | 1.1 | 4.7' |
| OSU-NOAO Infrared Imaging Spectrometer (ONIS) | InSb (5121024, 0.9-2.5m) | JHK | 0.35; 0.18 | 6'x3'/3'x1.5' |
| **0.9-m Telescope** | | | | |
| CCD Imager (DIR) | T2KA | 3300-9700 | 0.680 | 23.2' |
| CCD Mosaic (MOSA) (see note 4) | 8Kx8K | 4500-9700 | 0.425 | 59.0' |

* Unless otherwise noted, CCDs have 3300-9700 spectral range.

1 Phoenix is likely to be shipped to CTIO in third quarter 1998 and not available at KPNO.

2 New capability for February-July 1998 (Integrated Field Unit: 30" 45" field, 3" fibers, 4" fiber spacing)

3 Will be continued until fiber-feed capability is available elsewhere.

4 To minimize the number of instrument installations, the CCD Mosaic Imager will be available for block-scheduled, shared-risk observing on the 4-m and 0.9-m telescopes, with priority given to 4-m use. Check the CCD Mosaic WWW page for updates concerning new filters and progress toward replacing the current engineering-grade CCDs (the default for all of semester II 1997) with science-grade CCDs.

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# Requests for CTIO Telescope Time August 1997 - January 1998

| Telescope | | Nights Req. | Nights Sched. | Reqd. Sched. | Visitor Nights | Staff Nights | %Staff Nights | Eng. & Maint |
|---|---|---|---|---|---|---|---|---|
| **4-m** | **Dark** | 286 | 88 | 3.2 | 75 | 13 | 14 | 8 |
| | **Bright** | 211 | 60 | 3.5 | 45 | 15 | 25 | 28 |
| **1.5-m** | **Dark** | 179 | 91 | 1.9 | 83 | 8 | 8 | 2 |
| | **Bright** | 125 | 58 | 2.1 | 58 | 0 | 0 | 27 |
| **0.9-m** | **Dark** | 128 | 92 | 1.4 | 92 | 0 | 0 | 0 |
| | **Bright** | 71 | 64 | 1.1 | 57 | 7 | 10 | 13 |
| **Schmidt** | | 167 | 129 | 1.3 | 119 | 10 | 7 | 8 |
| **ESO 3.6-m** | | 17 | 7 | 2.4 | 7 | 0 | 0 | - |

Ximena Herreros

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# Requests for KPNO Telescope Time August 1997 - January 1998

| Telescope | Available to TAC | Long-Term Committment | Net | Nights Requested G | Nights Requested E | Reqd. Sched. | %Staff |
|---|---|---|---|---|---|---|---|
| **4-m** | 150 | | 150 | 160 | 124 | 1.90 | 14 |
| **WIYN** | 62 | | 62 | *35 | *38 | *1.17 | 2 |
| **2.1-m** | 150 | 10 | 140 | 174 | 157 | 2.36 | 22 |
| **Coude Feed** | 150 | 6 | 144 | 159 | | 1.10 | 20 |
| **0.9-m** | 150 | 8 | 142 | 106 | 67 | 1.22 | 8 |

KPNO received 230 proposals from visitors and staff combined, of which 7 were two-hour requests for WIYN. Of these, 19 were long-term proposals; one was granted long-term status. Three proposals granted long-term status in previous semesters were scheduled. The requests for Extragalactic and Galactic time are tabulated separately, with the oversubscription ratio based on the combined total.

(*) The WIYN statistics do not include the two-hour proposals and utilize a reasonable request estimate for synoptic proposals that did not request a specific total allocation.

Dick Joyce

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# Staff Comings and Goings

There have been several happy additions to our scientific staff in the past few months, and a number of departures from the technical staff.

First to arrive was ***Robert Blum***, leaving a Hubble Fellowship at JILA (University of Colorado) to join us as an infrared Assistant Astronomer in May. Bob is no stranger to CTIO, having been a frequent observer here and a collaborator with many former Tololinos during his graduate student days at Ohio State (PhD 1995). His current research activity centers around studies of the stellar population in the inner Galaxy. He will also be collaborating with Brooke Gregory and Ron Probst in our IR instrumentation program. Bob, is accompanied by his wife Denise, son Brian (5 years), daughter Megan (4 months), and their faithful dog Gizmo.

The second arrivals are ***Patrice Bouchet***, wife Terry, and son Antoine (3 years). Patrice began a one year Support Scientist appointment in June. He comes to us from ESO where he has been holding a Senior Staff Astronomer position and heading the Infrared Group at La Silla. Patrice's main interests are supernovae and their remnants. He will join the IR team implementing the tip-tilt facility on the Blanco telescope, assist visiting astronomers using IR instruments, and act as liaison scientist during the 2MASS startup.

Our most recent arrival, in August, is ***Ren MÃ©ndez Bussard***, who is coming to CTIO under a postdoctoral fellowship program aimed at the reinsertion of Chilean scientists working abroad into the national scientific community. Ren has B.A. and M.S. degrees from the University of Chile, a PhD from Yale (1995), and has most recently held a postdoctoral position with ESO in Garching. His research focuses on the kinematical and dynamical description of stellar populations in the Galaxy as constraints on theories of Galactic formation, using the interplay between large scale astrometric and photometric surveys and sophisticated model codes. Ren's scientific contacts in the North American, European, and Chilean communities will be put to use in support of CTIO efforts in light pollution, cooperative projects, and public outreach. Ren's family are wife Rosa Garay Fluhmann, and daughters Manuela (7 years) and Josefina (9 months).

1997 will be remembered as the year that Gemini began to have a direct impact on the technical operations at Cerro Tololo. We have anticipated for some time that Gemini would exert a powerful attraction for some of our technical staff. It would be surprising if it were not so, after talking about Gemini as our future for so many years. At the same time, we

expected that Gemini would want to use some of the CTIO technical personnel for staffing the southern Gemini telescope on Cerro Pachon. Over the months from June to August, we will see three members of our permanent staff relocate to Hawaii to participate in the commissioning of the Gemini-North telescope. We expect that they will return to Chile for the commissioning of the Southern telescope and then remain in Chile during the operation phase of Gemini starting in 2001.

Though we see this process as natural and in the long run a healthy one for the southern Observatories, CTIO plus Gemini, the immediate impact is the pain of losing experienced colleagues and good friends. The experience and dedication of these employees will be sorely missed.

The employees who are going to Gemini at this time are: ***Gustavo Arriagada***, TELOPS electronics engineer, who came to Tololo in 1986; ***Manuel Lazo***, electronics engineer in TELOPS and lately in the La Serena Electronics Group, who came to Tololo in 1986; and ***John Filhaber***, Optical Engineer, who came to Tololo in 1995. We wish them well in their work with Gemini and hope to see them back in Chile in a couple of years!

Though not a member of our permanent staff, ***Luis Godoy***, an instrument maker in the La Serena shops, has also been hired by Gemini and will going to Hawaii in August. Luis has been working with us on a temporary basis for several years supported by funding from the MACHO project which is used to improve the small telescopes.

This Newsletter also marks the departure of ***Gary Webb*** and his family from CTIO. In the more than 15 years he has been at Tololo, Gary worked in several major areas. He was system manager for the Data General computers both in La Serena and on the mountain. He wrote a significant fraction of the code to control the first incarnation of the IR Spectrometer (used for the observations of SN1987a, for example). Since 1989, he has been associated with various phases of the Arcon software system. All waveforms generated every night for every Arcon controlled instrument are the result of Gary's efforts. Gary is taking a position with Raytheon Corp. in Waco, Texas, to develop software for the Stratospheric Observatory for Infrared Astronomy (SOFIA). All Tololinos, and their many other Chilean friends, wish the Webbs well in their new life back in the States.

Finally, we are losing another of our experienced mountain support persons. Telescope operator ***Luis Gonzalez*** leaves Tololo in August. He is moving to a research position at Cerro Calan Observatory, University of Chile, Santiago. Luis' ability, and his warm and cheerful personality, will be missed on the mountain.

Malcolm Smith, Brooke Gregory, Oscar Saa

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# Argus to be Replaced by Hydra II

Argus, CTIO's venerable fiber-fed, multi-object spectrograph, which has been in service for nine years, will soon be replaced with an improved version of the WIYN Hydra. With six times as many fibers, better positioning accuracy and superior performance in the UV, CTIO's "Hydra II" will have significantly higher performance than Argus and is scheduled to go into full service during 1999. Proposals for shared risk observing during the first semester of 1999 will be accepted next year. Hydra II is expected to become fully operational for routine observing during the second semester of 1999.

Hydra will be installed during the second semester 1998, which necessitates the removal of Argus towards the end of the first semester. This will allow new fibers and a new R/C ADC corrector to be installed and the spectrograph modified. Argus decommissioning has been tentatively scheduled for May 1998, the exact date depending on demand for final use of the instrument. Once Argus has been decommissioned, there will be no multi-object spectrograph available at CTIO until Hydra II is functional. This will be roughly the period May 1998-January 1999.

T. Ingerson, R. Schommer

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# Argus: A Candidate for Recycling

Even though Argus is soon to be decommissioned, it will not lose its potential as a scientifically useful instrument. Because of its architecture, Argus is an interesting candidate for moving to another telescope under a long term loan arrangement. It is completely stand-alone and can be controlled by any PC through a single serial line. Its 32 meter fiber bundle will be removed intact from the telescope and would not be difficult to install in another location.

Though Argus is now used at prime focus of the 4-m Blanco telescope, an ideal new home would be at the R/C or Cassegrain focus of a 1 to 2 meter telescope with a scale of 20-50"/mm. Argus' weight of ~ 50 kg would not be excessive for such a location. A telescope like this will need a simple wide field corrector/field flattener, which could easily be installed at a modest cost if one does not already exist.

The bottom end of the fiber bundle requires a spectrograph with an 18mm slit. A bench spectrograph would be straightforward to construct if an appropriate spectrograph were not already available. Many of the parts for the Argus bench spectrograph could be reused.

There is no plan to move Argus to any other NOAO facility, or to support its use elsewhere beyond a pro forma loan arrangement. Anyone interested in possibly using Argus after it is retired should contact tingerson@noao.edu to discuss the technical feasibility of any proposal.

Tom Ingerson

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**NOAO Newsletter - Cerro Tololo Inter-American Observatory - September 1997 - Number 51**

# New Version of the 1.5-m Telescope Control System

A new version of the telescope control program for the 1.5-m telescope was installed in mid June. The functionality and performance of the telescope have changed very little, so that this upgrade will be largely invisible from the point of view of the user. However, the VME hardware and software at the heart of the system are significantly different. In particular the code has been ported to the VxWorks operating system in order to restore commonality between the 1.5-m software and that in use at the 4-m. Although the control systems at the two telescopes were originally very similar, the 1.5-m system got left behind when the 4-m was converted to VxWorks several years ago. Furthermore, due to a bug in the compiler for the development system used previously, we have been unable to modify the 1.5-m code for a considerable time. The CPU for the VME bus computer was also upgraded making it identical with that in use at the 4m. These changes will greatly simplify the task of maintaining and improving the two systems.

### New GUI at the 4-m and 1.5-m Telescopes

In mid-August the 1.5-m TCS will be replaced by a Graphical User Interface modeled on that in use at KPNO. A similar GUI will be installed at the CTIO 4m telescope shortly thereafter. This GUI includes two tools that may be of interest to observers.

Firstly, there is the Xgstar program that can be used by the telescope operator or the observer to select guide stars from the HST Guide Star Catalog. This has been customized so that it knows the correct size and shape of the region accessible with the guide probe at the various foci of each telescope. The new version of the program also accesses a copy of the GSC stored on hard disk, rather than reading the CDRoms, resulting in improved speed and reliability. The telescope operator can use Xgstar to select guide stars on the fly. However, it can also be run from any of the CTIO visitor accounts, allowing users to pre-select guide stars for each object. This is the recommended procedure for working in sparsely populated fields, especially with the f/14 secondary at the 4-m telescope where the field accessible to the guider is rather small.

Secondly the Xobject package is available to help selection of coordinates from several standard catalogs (including the SAO, Yale Bright stars, IR and optical photometric and spectrophotmetric standards, etc.), as well as from user coordinates files. The format of the user files is the same as that previously in use at both telescopes. The entry for each object consists of a label, three numbers for RA (hours, minutes and seconds), three numbers for DEC (degree, minutes and seconds), the epoch in years, proper motion in RA and DEC (both in arcsec/year), and finally an arbitrary comment. Each entry is one line of text, containing a maximum of 80 characters, in free format, with the fields delimited by spaces. For example:

6-CMi 7 29 09.4 12 01 52 1988.5 0.0 0.0 Sp. = K2 III

The label field must contain printable characters only, with no commas, semicolons, spaces or tabs. There is no limit on the number of entries, although for speed of access no more than about 1000 objects should be recorded in a single file. The TCS control computer can access coordinate lists stored on any computer in the CTIO network. Users who have prepared coordinate lists in advance need only copy them to their visitor account in Chile via ftp or e-mail.

Steve Heathcote, German Schumacher,
Rolando Cantarutti, Pedro Gigoux

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**NOAO Newsletter - Cerro Tololo Inter-American Observatory - September 1997 - Number 51**

## BTC Agreement Extended

The BTC (Big Throughput Camera) Mosaic Imager is now entering its second semester of use on the Blanco 4-m telescope, after a very successful first semester. The agreement between the BTC team (Tony Tyson and Gary Bernstein) covered the loan of the instrument for 1997 only. Recently we have arranged for the BTC loan to continue through 1998 semesters 1 and 2, following which time a clone of the NOAO Mosaic Imager (http://www.noao.edu/kpno/mosaic/) will be commissioned. The BTC WWW pages (http://www.ctio.noao.edu/instruments.html) or (http://www.astro.lsa.umich.edu/~btc/tech.html) give a detailed description of the instrument and how to use it. Upgrades planned over the next few months include providing a Sun Ultra to speed data reduction. We also have on order three large interference filters with center wavelengths 5007, 6563 and 6728.

Alistair Walker

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**NOAO Newsletter - Cerro Tololo Inter-American Observatory - September 1997 - Number 51**

## CCD News: The Good, Sort of

Last Newsletter we had the "Bad and the Ugly," so it's only natural that we have the "Good" this time. Firstly, we have purchased a Grade 1 SITe 2048 CCD. This is a thinned device, with four low-noise amplifiers and near-perfect cosmetics. It has the "standard" SITe AR coating and thus has QE over 60% from 3900 to 8700, peaking at 80% in the red. This CCD will replace the failed (Tek 2048 #4) CCD, with use mostly for 4-m imaging and echelle spectroscopy. Tests in the detector lab and at the telescope confirm the high quality of the new CCD. All that remains is to tweak a few voltages in order to optimize full-well behavior before releasing for general use.

Secondly, our STIS 2048 CCD, used at the Schmidt, suffered broken bond wires when a bolt became detached inside the dewar and its associated washer ended up on the CCD surface. Observers over the two weeks following the incident had to make do with a variety of CCDs but since then most have been scheduled with Tek 2K #5, a thinned CCD with high QE but large pixels. We took the opportunity to remove the cracked coating (see NOAO Newsletter No 50. p9) before sending the damaged STIS CCD to Mike Lesser (Steward Observatory) for re-attachment of the bond wires. The CCD was then re-coated by Kirk Gilmore (Lick Observatory). A second, spare STIS 2048 CCD was coated at the same time. Tests indicate that our original STIS is now working on two amplifiers only. The second CCD also only has two low-noise amplifiers, but rather better cosmetics, and will likely be the one chosen to be installed at the Schmidt. The doubling of the read time implied by the use of two amplifiers rather than four (to approximately one minute) will unfortunately lower observing efficiency.

Alistair Walker, Roger Smith

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# IRS News

The CTIO IR Spectrometer has recently returned to service after one of its trienniel facelifts. It was removed from service for the months of March-May to be modified to work with the new 4-m tip-tilt secondary at f/14. In more detail:

- The entrance optics were modified to accept the f/14.5 beam from the telescope and convert it back to the f/24.5 beam, which the IRS uses internally. The scale at the slit and the detector are unchanged.
- In addition to re-imaging the focal plane, the foreoptics now provide an image of the telescope exit pupil on a cold Lyot stop ahead of the slit. This represents a substantial improvement in baffling the input beam. In the previous incarnation of the IRS the Lyot stop was after the slit, which left opportunities for out-of-beam radiation to scatter inside the spectrometer.
- The instrument was converted to an up-looker by eliminating a 45 entrance mirror, which also served to select light from on-board comparison lamps. These were therefore sacrificed. Comparison lamps in the 4-m RC guider are adequate for setting up the instrument. Sky lines are also abundant, of course, and more useful because they are observed with same conditions as the object (flexure, illumination).
- A new mounting bracket, dubbed "Popeye," grasps the instrument between well-muscled arms and holds it rigidly below the tip-tilt guider box. Increasing the rigidity of support was another primary goal of the upgrade.
- The fine alignment of the instrument beam with the telescope beam is now done via the folding flat mirror in the tip-tilt guider box.
- Several baffles were rebuilt to make better seals against leakage of ambient temperature radiation from the dewar walls. We also scanned the dewar interior and found one major leak, which we will plug. We also implemented a glass blocking filter immediately in front of the detector that cuts out 3-5 m light that might have leaked in. This has the disadvantages that: 1) it must be removed for programs requiring observations in this range and 2) there are reflection losses from the glass surfaces. But until the stray light level is acceptably low without it, we believe this is the preferable configuration for observers in the 0.9-2.5 m region.

### Guiding and Acquisition

Making the change to the f/14 secondary with tip-tilt capability has important implications for observing procedures both because of tip-tilt per se but also because of some more subtle changes in the guiding/acquisition environment.

- The on-axis dichroic of the old system is replaced by a dichroic in the tip-tilt guider box. A modified CTIO CCDTV views the on-axis field in visible light via the dichroic (in transmission). The CCDTV is no longer fixed with respect to the field. It can be scanned to cover a field about 5' square. The camera can be used for both acquisition (in a panoramic mode) and for fast-guiding (tip-tilt) anywhere within the field. The tip-tilt capability has been shown to give large gains in throughput (factor of 3-5 under conditions of moderately good seeing). The system has been used only for a very limited period and we do not have reliable data on performance as a function of magnitude.
- In addition, the off-axis guide probe is useable as well. This provides an alternative for fields lacking a tip-tilt guide star, or for bright-object programs in which sensitivity is not an issue (the off-axis guider is somewhat faster to set up).

The manual on the Web has been modified to reflect the changes in the IRS. Those wishing an archival copy are advised to wait before downloading, however. The present version is subject to frequent revision.

Brooke Gregory

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# Undergraduates Wanted for the 1998 CTIO REU Program!

A reminder for undergraduates and undergraduate advisors: the deadline for applications to participate in the 1998 CTIO Research Experiences for Undergraduates (REU) Program is 26 September 1997. Funding has been approved, and we anticipate offering four Undergraduate Research Assistantships for a 10 week program starting in mid-January 1998.

The CTIO REU program offers students the unique opportunity gain observational experience studying objects in the rich Southern hemisphere (the Magellanic Clouds, the Galactic center, etc.), while also providing them a chance to work alongside Chilean astronomy and engineering students who come to CTIO for summer projects. The CTIO program is also the only NSF REU site that is run during the academic year, providing an alternative to those students who can take advantage of a quarter or semester off and/or who are interested in participating in an overseas program.

For more information, visit our REU web page at: http://www.ctio.noao.edu/reu.html.

Chris Smith (U. Michigan),
Malcolm Smith, Mark Phillips

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# Arriving Early on the Mountain

Since our summit facilities are limited, and extra persons place an extra burden on technical support staff, we have generally discouraged the practice of arriving on Tololo before the starting day of a run.

However, it is apparent that the operation of some of our instruments is a sufficiently complex task that an early arrival to begin the learning process will enhance the science output. This is particularly true for first time or "rusty" users of Argus, the Rutgers Fabry-Perot, and the IR tip-tilt instruments COB and IRS. Observers using these instruments may wish to arrive a day ahead of their scheduled run and spend the evening quietly looking over the shoulder of the previous observer, with his/her prior consent. Requests to do so will be regarded favorably by CTIO.

The normal level of startup support will continue to be provided for these instruments on the scheduled first night of a run. We do not intend that the departing observer substitute for scientific staff support!

Malcolm Smith,Tom Ingerson
Bob Schommer,Ron Probst

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# OSCIR, A New Infrared Capability at CTIO

We are pleased to announce the availability of 8-25 m imaging and spectroscopy capabilities to CTIO users. This results from an agreement between CTIO and a group at the University of Florida, led by Charles Telesco, for use of the instrument OSCIR.

OSCIR provides imaging at K through Q (20 m) with broad and narrowband filters, and spectroscopy at 8-14 m with resolutions of ~ 40 to ~ 1000. The detector is a 128 X 128 pixel arsenic-doped silicon array from Rockwell. Pixel scale is 0.18" per pixel with a 23" field (or slit length). OSCIR uses the f/30 focus of the 4-m telescope. Further technical and performance information can be found at the OSCIR Web site, www.astro.ufl.edu/~fisher/iral/oscir.html or by a link

from the CTIO Web pages, or by contacting Charles Telesco by e-mail (address below) or telephone (352-392-4455). OSCIR has been available for collaborative use at the IRTF since December 1995. Initial engineering and science data obtained with it on the Blanco Telescope indicate a similar high level of performance is attained here at 10 m; the 20 m performance is as yet uncertain.

Our initial agreement is for first and second semesters of 1998, beginning in February 1998. Proposals to use OSCIR should be submitted in the same manner as any other proposal to CTIO, and there are no restrictions on its use. We are delighted to bring this capability to the Southern Hemisphere.

Ron Probst
Charles Telesco (telesco@astro.ufl.edu)

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# The WIYN Queue Observing Experiment: The First 1997 Semester Comes to a Productive Conclusion and the Second Semester 1997 Queue Begins

The First 1997 observing semester is complete and all TAC-approved programs have been terminated. Data have been distributed to all investigators whose programs were completed or initiated during the semester. If you have not received data that you were expecting, please contact us at wiynq@noao.edu. Investigators who submitted proposals for programs that were not executed or completed should remember that new proposals must be submitted for TAC review if these programs are to be initiated or completed during future observing semesters.

At the time this article went to press, only 2 nights remained in the first semester 1997 WIYN Queue Observing Program. Data were obtained on 46 of 50 nights through July 2. The four unused nights were lost to weather. Nearly 12 hours of extra bright time were used for Queue observations during two scheduled T&E nights. All together (not including the remaining nights in the semester), 201 hours of dark time and 74 hours of bright time were spent obtaining data. This represents 62% of the time allocated for the WIYN Queue program during first semester 1997 (63% dark time; 60% bright time). This fraction of usable time is slightly higher than for previous semesters of Queue operation, but has been remarkably consistent over the lifetime of the Queue experiment. Only 22 hours were lost to technical problems during the past semester; this is slightly less than 5% of the entire NOAO WIYN Queue time allocation and represents a factor of two improvement over the second semester 1996.

Twelve of 32 programs were completed, and an additional 2 Hr Queue program potentially could be completed on the last night of the semester. All bright time, high priority long programs were completed. Though not officially completed, substantial progress was made on the four high priority synoptic programs during the semester. Five programs were not initiated, including four in the "best effort" category. All of these programs were dark time Hydra proposals, which could not be started because of a stretch of bad weather in late March and early April. Not only was this time best for observing many of the targets requested by these programs, but observations for high priority programs had to be postponed; this left little time during the second half of the semester for best effort programs. The table below summarizes the approximate level of completion for the observing programs in the first semester 1997 queues. A more detailed accounting of the past semester can be found at http://www.noao.edu/wiyn/obsprog.

**First Semester 1997**
**WIYN Queue Observing Experiment**

| | | Level of Completion | | | | |
|---|---|---|---|---|---|---|
| | **Total** | **0%** | **25%** | **50%** | **75%** | **100%** |
| Long Programs | | | | | | |
| High Priority: | | | | | | |
| Standard | 7 | - | 1 | 1 | - | 5 |
| Synoptic | 4 | - | 1 | 3 | - | - |
| Best Effort: | 13 | 4 | 3 | 2 | 2 | 2 |
| 2HrQ Programs | | | | | | |
| High Priority: | 7 | 1 | - | 2 | - | 4 |
| Best Effort: | 1 | - | - | - | - | 1 |
| Totals: | 32 | 5 | 4 | 6 | 5 | 12 |

The observing queues for second semester 1997 have been constructed and can be reviewed on our Web site at http://www.noao.edu/wiyn/obsprog/queue/F97/F97-Index.html. The NOAO WIYN Queue observing program has been allocated 62 nights (652 hours) between 1 August 1997 and 31 January 1998. A breakdown of the second semester 1997 in bright and dark time available is given in the following table.

**WIYN Queue Observing Experiment:**

**Second Semester 1997**

| | #of programs | | Hours reqd. | |
|---|---|---|---|---|
| | Dark | Bright | Dark | Bright |
| Long Programs | | | | |
| High Priority: | 7 | 5 | 197 | 96 |
| Best Effort: | 4 | 4 | 80 | 80 |
| 2HrQ Programs | | | | |
| High Priority: | 1 | 1 | 2 | 2 |
| Best Effort: | 1 | 3 | 2 | 6 |
| Totals | 13 | 13 | 281 | 184 |
| Available Hours | | | 467 | 185 |

26 science programs are included in the queue experiment with an even mix of bright and dark programs. The major scheduling constraint for this semester is for bright time programs having targets in Orion. Because of the large number of programs with targets in and around this region of the sky and the relatively few bright nights during the latter half of the semester (with the moon not too close to the Orion targets), two highly ranked programs had to be placed in the "best effort" queue. The oversubscription in Orion also forced two programs to be dropped from the queue that had TAC grades that would have allowed their inclusion in the best effort queue. Bright time has been fully scheduled, but there is a weather "buffer" of nearly 190 hours of dark time. Accordingly, some bright programs may be shifted into dark time. However, over 60 hours of dark time is in August when the weather is usually poor and during fall 1996 a scheduling buffer of about 100 hours disappeared before the middle of October.

A third instrument for the WIYN telescope will be available for use during NOAO time beginning in the first semester of 1998. DensePak will join Hydra and the WIYN Imager and be scheduled within the WIYN Queue program. Please see the DensePak article in this issue of the Newsletter for a description of this instrument. The DensePak fiber bundle will feed the Bench Spectrograph as does the Hydra MOS. Unfortunately, the WIYN Imager must be removed from the telescope for DensePak to be mounted. During the first 1998 semester, DensePak will only be offered for use in **Bright Time** so that there is no direct conflict between programs requiring its use and WIYN Imager programs that require dark time.

The WIYN Queue program has now been in operation for two years and NOAO would like to gauge the effectiveness of this experiment. Within the next few months investigators who have been involved in the queue process will be sent a questionnaire concerning issues raised by queue observing. This will be useful for refining the WIYN Queue program so that it better meets the needs of the community (if users indeed deem that the operational and scientific advantages offered by queue observing warrant the continuation of the program). If you receive a questionnaire, please answer all of the questions relevant to your experience with the queue process. This direct community input will largely determine the nature of any future "non-classical" observing program for the 40% NOAO share of time on the WIYN telescope and influence the structure and scope of queue and service observing programs envisioned for other NOAO facilities. We also solicit input concerning any aspect of the NOAO WIYN Queue experiment from all members of the astronomical community. Questions, suggestions, or comments concerning the general queue process can be sent to wiynq@noao.edu.

Paul Smith, for the WIYN Queue Team
(Di Harmer, Daryl Willmarth)

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# DensePak is Added to the KPNO WIYN Arsenal for 1998 Bright Time

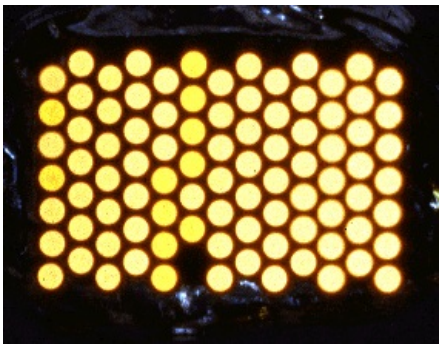
KPNO is pleased to announce that DensePak will be added to the NOAO WIYN instrument suite. DensePak will be used **only** for suitable **Bright Time** projects during first semester 1998.

DensePak is a fiber optic bundle that forms an array of 91 fibers in a 7 X 13 rectangle (see figure). Each fiber is 300 m in diameter, corresponding to 3" on the sky at the Nasmyth focus of the WIYN telescope. Fiber-to-fiber spacing is 400 microns and the overall dimensions of the array are 30" X 45". The array's orientation on the sky can be selected by setting the instrument rotator to the proper offset angle. Additional fibers are offset from the array corners roughly 60" from the center to serve as sky fibers. The proximity of the sky fibers to the array may necessitate moving the telescope off target to sample the sky properly, depending on the angular size of the target. Sky fibers have the same diameter as those in the array and the "blue" fiber cable used in the Hydra MOS, though DensePak's fibers have transmission characteristics similar to the Hydra "red" fiber cable. At present, two fibers in the array are unusable (fibers 46 and 59;

fibers are numbered according to their slit position at the spectrograph). In addition, the throughput of several fibers at wavelengths < 4500-5000 has been found to be substantially lower than that found for the majority of fibers in the array. Investigators proposing to use DensePak should review the relevant material at http://www.noao.edu/wiyn/obsprog.

DensePak's fiber bundle feeds the WIYN Bench Spectrograph. Therefore, users have the same spectroscopic options for DensePak as offered for Hydra (see the Hydra Users Manual at http://www.noao.edu/kpno/manuals/hydraman/hydrawiynmanual.html ). When running the spectrograph setup program, investigators should choose the blue cable to match the fiber diameter with that used in DensePak.

DensePak will have a significant impact on the planning and operation of the WIYN Queue program because DensePak and the WIYN Imager use the same instrument port. Given the delicacy of the two instruments and the amount of time necessary for an instrument change, DensePak and the imager will not be swapped during nightly operations. Furthermore, the flexibility and efficiency of the WIYN Queue during dark time are largely due to the ability to 1) switch rapidly between imaging and spectroscopy (with Hydra), and 2) match the available seeing conditions with program requirements. Nights when DensePak is mounted for use will greatly compromise many of the advantages of scheduling the NOAO WIYN time allocation in queue mode. As a result, DensePak will be restricted to use only during **Bright Time** for the first semester of 1998. Questions concerning DensePak may be sent to wiynq@noao.edu.



**Caption:** Configuration of the DensePak array and sky fibers. The "missing" fibers in the array have been damaged and are unusable (fibers 46 and 59).

Paul Smith, for the WIYN Queue Team
(Di Harmer, Daryl Willmarth)

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# Coud Feed to Remain Open - Until it Moves to the 4-m

To preserve and enhance the available capability in high resolution optical spectroscopy at Kitt Peak, we are proposing to move components of the 2.1-m coudÃ© spectrograph to the coudÃ© room of the Mayall 4-m telescope. This move will enable the current CoudÃ© Feed Telescope to be closed, resulting in support and cost savings, while providing significant scientific gains through the implementation of a high spectral resolution instrument--exceeding R = 300,000--at a large aperture telescope.

In reviewing the options, it was concluded that feeding the coud spectrograph with an optical fiber from the 2.1-m would produce only marginal scientific gains for some programs while eliminating some other programs altogether. Installing a fiber-fed spectrograph at the 4-m, however, would yield a substantial increase in scientific capability, especially for studies of the interstellar medium and stellar astrophysics. We have submitted a description of the instrumental concept and the scientific rationale for moving the fiber-fed coud spectrograph to the 4-m to the NOAO nighttime joint Users Committee for their review and comment. At this time, we are developing plans for the modification of the 4-m coud room, and we hope to install the 4-m spectrograph during FY 2000. For the meantime, the Coud Feed Telescope will remain open with new starts restricted to one per week.

Mark Giampapa, Sam Barden, Caty Pilachowski

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## Seasons Reasoned

As described elsewhere in this Newsletter, we are upgrading the database used for, among other things, handling electronically submitted observing proposals and scheduling the telescopes. Since proposals for both KPNO and CTIO are now submitted to NOAO, there is a potential for confusion in the traditional seasonal reference to the observing semesters. For that reason, the designations "spring" and "fall" will be superseded by the more hemisphere-neutral terms "A" and "B," which will respectively refer to the first (February-July) and second (August-January) semesters of an observing year.

Dick Joyce

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## Electronic Proposal Submission on the Web!

The "experiment" in electronic submission of proposals, which began about three years ago, has been enormously successful. Last semester, all but two of the 229 proposals were submitted electronically. This procedure is not only more convenient for observers, but significantly increases our efficiency in dealing with the large number of proposals and using the new database developed for the TAC and scheduling process.

For the upcoming 1998A semester, we are especially encouraging observers to prepare and submit their proposals via the World Wide Web. This is a new procedure that is described in an article in the SCOPE Section of the Newsletter. This article describes the new database and the details of proposal submission. We encourage investigators to read the instructions and utilize the new WWW proposal submission process.

Dick Joyce

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## Exabytes, DATs, and Nine-Tracks at KPNO

We are planning to make some changes in the peripherals attached to the data-taking Suns at KPNO. Before the start of the fall observing semester, we hope to supplement the Exabyte 8200 8-mm tape drives in the domes with Exabyte Eliant 820 drives. Eventually (but not for at least a year), the Exabyte 8200 drives will be removed. We also plan to remove all the HP 35480 DDS-1 DAT (4-mm) tape drives and replace them with Seagate Scorpion-8 DDS-2 drives.

These new drives are cheaper, faster, more reliable, more flexible and hold more data on a cartridge than the drives being replaced. However, you now have to make some important choices when you write your data to tape. Both the type of tape you use and the "density" you specify are important. Make sure you know what the capabilities of your tape drives at home before you make your choice! For example, tapes written on one of the new Exabyte Eliant 820 drives cannot be read on an older Exabyte 8200 drive.

The existing Exabyte 8200 drives write in "low density" on 112-m tape cartridges (nominal capacity: 2.5 GB). The new Eliant 820 drives can write in "high density" on 112-m tape cartridges (nominal capacity: 5.0 GB) and "high density" on

160-m tapes (7.0 GB). The DDS-2 DAT drives can write on 60-m tape cartridges (nominal capacity: 1.3 GB), 90-m tapes (2 GB) and 120-m tapes (4 GB). IRAF provides device names for all these possibilities: please check the lists posted in the domes or the "devices" command within IRAF for details.

Note that once we retire the Exabyte 8200 drives from the domes, observers will no longer be able to conveniently make "low density" Exabyte tapes. However, we will endeavor to keep an 8200 drive operational as long as possible on our "media conversion" Sun located in the Administration Building.

The mountain office in the Administration building will stock 112-m and 160-m Exabyte tapes and 60-m, 90-m and 120-m DAT tapes for purchase. Remember, if you bring your own tapes, bring only **computer grade** (certified for Digital Data Storage) tapes.

Note that although both the Exabyte and DAT drives feature hardware data compression, we don't support the use of hardware compression through the IRAF device names. We have found that hardware data compression is not very effective on CCD frames. Furthermore, when hardware data compression is used, the length of tape occupied by each file cannot be determined thus invalidating the use of IRAF's "tapemon" task to monitor the amount of tape used. However, there is a move afoot to provide in the future a facility within IRAF to more intelligently compress data before it is written to tape.

We have had some terrible reliability problems with our DAT tape drives over the past year which has led to our decision to replace all of our existing HP 35480 DAT drives. During testing of the new Seagate DDS-2 drives, we have discovered that our old HP 35480 DDS-1 drives can not read successfully tapes written with the new DDS-2 drives. All other DAT drives we tested read the tapes fine. This result has shaken our faith in DAT drive interoperability (and reinforced our decision to throw away the HP 35480 drives!). We advise checking carefully that your DAT drives at home can read DAT tapes written with our drives before committing valuable data solely to DAT tapes. Towards this end, we are willing to send you a DAT tape written with our new mountain DAT drives: contact observing support.

Finally, note that nine-track tape drives are no longer installed on any of the dome data-taking Suns at KPNO. There is one nine-track drive installed on a Sun in the Administration building (also featuring Exabyte and DAT drives) which may be used for post-observing data conversion.

Steve Grandi (grandi@noao.edu)
Rob Seaman (seaman@noao.edu)

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# Ed Carder Retires After 23 Years of Service

Effective 30 June, Ed Carder has retired from the Instrument Support Group. Ed's career began when the PDS Microphotometer was a new instrument and digitally scanning photographic images was a sophisticated method of data extraction. Ed also maintained most of the laboratory measuring equipment, the optical filter collection, and he supported the "Save-the-Bits" data archive. In more recent times, he became a vital element in observer support at the telescopes. He had many instruments under his charge over the years, among them were: IRS (Intensified Reticon Scanner), IIDS (Intensified Image Dissector Scanner), CCD direct imaging, the GoldCam CCD spectrometer, the Coud Feed spectrograph, CCDPhot photometric package, and direct CCD imaging at the Burrell Schmidt and 0.9-meter telescopes.

Ed's cool steady hand and unflappable demeanor will be missed. We wish him well in his retirement and bid him a unanimous "Thanks" for a job well done.

Jim DeVeny

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# From the NSO Director's Office

In the previous Newsletter, I described the increased participation by NSO scientific staff in the efforts to develop a successful proposal for a large visible/infrared telescope. The resulting task groups have been very active since then, involving a number of participants from outside NSO as well. The science task group in particular has concentrated its efforts on defining the scientific targets for the facility, deriving from those targets the required parameters for the telescope. This effort assumed special urgency due to the aggressive review schedule of the Space Studies Board Task Group on Ground-Based Solar Research (the "Parker Committee"). As a result, a report on the science goals has been prepared and the NSO staff has agreed on the parameters for the facility (300 cm aperture; visible and full IR coverage; adaptive optics; best site; 3 arcmin field-of-view; low scattered light coronagraphic, provided the cost impact does not exceed 10%). In parallel, an interim technical report is available on the feasibility study for the CLEAR (Coronagraphic and Low Emissivity Astronomical Reflector) facility.

Adaptive optics is a major capability requirement for any future large solar telescope. Thomas Rimmele and Rich Radick recently reported the successful implementation of the Sac Peak Vacuum Tower Telescope active optics system, which is able to correct the remaining telescope optics aberrations. This capability presents major progress in the development of adaptive optics at NSO. It demonstrates our ability to do wavefront sensing on the extended, low-contrast object that is the solar image. Together with the earlier demonstrated ability to do rapid tip-tilt correction, this sets the stage for the implementation of a full-up adaptive optics system. In a joint program, the NSO and the USAF team at Sac Peak have embarked on a high-priority program to build a 20 Zernike adaptive optics system at the VTT in the next two to three years.

Unfortunately, there is no news to report on the SOLIS initiative. We don't expect a new start until FY 1998. At Sac Peak everything is in full progress in the implementation of the USAF ISOON prototype.

Jacques M. Beckers

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# Servo Problem at FTS "Cleaned Up"

A significant drop in the FTS Zeeman split servo laser had been noted over the past few months. Careful attention to cleaning of the optical surfaces inside the FTS vacuum tank and realignment failed to recover the signal. In fact, the signal continued to decline to the point that the instrument was becoming noticeably less stable. Tuning the electronics, likewise, didn't regain the lost signal. The FTS was beginning to suffer from poorly registered coadded scans. The data were beginning to suffer.

The servo laser is housed in a "pressure bubble" inside the FTS vacuum tank, which is kept at a pressure of one atmosphere for cooling by an air compressor. The laser bubble was inspected and found to be badly contaminated by an oily film. The compressor, it was found, had a plugged drain valve and a large amount of water and oil condensed in its tank. It was this oil that had found its way to the FTS servo laser. The plug was removed and the oily water drained out of the system.

The laser head, an HP 5500C, was opened and the intracavity optics were cleaned. This cleaning recovered about a factor of two in signal; however, it was still somewhere around a factor of two below what the FTS records show it should have been. The next step was to remove and clean the non-exposed optics. This included the laser's beam-expander/collimator and a set of 1/4 and 1/2 waveplates. The waveplates create the orthogonal linear polarization that the FTS is aligned to and so is only disturbed with good cause. The beam-expander and waveplates were removed and cleaned along with the exit window of the laser tube by "drag-wiping" with a lens tissue and alcohol.

The cleaned optics were reinstalled and aligned and the polarization axes were tuned. Surprisingly, almost a factor of three increase in servo signal was found! The combination of careful cleaning, aligning, and tuning has left the FTS with the highest servo signal ever recorded! Mike Dulick ran the instrument on 18th and 19th July and reported that the servo system was behaving stably.

Claude Plymate

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# 18th NSO Summer Workshop on Synoptic Solar Physics 9-12 September 1997

This international meeting will examine the role of sustained, regular measurements in advancing our understanding of the Sun as a large-scale, time-varying system. Observers and theorists will come together to examine what has been learned from synoptic measurements, to identify scientific opportunities for the next decade, and to discuss technical approaches for exploiting these opportunities. Although the Sun varies on timescales from milliseconds to gigayears, this workshop will focus on phenomena in the solar atmosphere that develop over time (diachronically) on scales of hours to decades. It is expected that many of the discussions will address current problems in solar activity and how synoptic observations help solve those problems, and strategies for defining, collecting, combining, archiving, and interpreting sustained time series of imaged data.

About 80 national and international participants will attend the workshop, which will be held at the new Science and Visitor's Center at Sacramento Peak. This year's annual workshop will be centered around the theme of Synoptic Solar Physics. The workshop organization is supported by funding from NSF, NOAO, NSO, NASA, and the USAF Office of Scientific Research (including the Asian Office of Aerospace Research and Development and the European Office of Aerospace Research and Development).

K.S. Balasubramaniam, Jack Harvey, Doug Rabin

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# NSO Observing Proposals

The current deadline for submitting observing proposals to the National Solar Observatory is 15 October 1997 for the first quarter of 1998. Forms, information and a Users' Manual are available from the NSO Telescope Allocation Committee at P.O. Box 62, Sunspot, NM 88349 for Sacramento Peak facilities (sp@sunspot.noao.edu) or P.O. Box 26732, Tucson, AZ 85726 for Kitt Peak facilities (nso@noao.edu). A TeX template and instruction sheet can be emailed at your request; obtained by anonymous ftp from ftp.sunspot.noao.edu (cd pub/observing_templates) or ftp.noao.edu (cd nso/nsoforms); or downloaded from WWW at http://www.nso.noao.edu/.

Dick Altrock



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# NSO Telescope/Instrument Combinations

```
Vacuum Tower Telescope (SP)
   Echelle Spectrograph
   Universal Spectrograph
   Horizontal Spectrograph
   Universal Birefringent Filter
   Fabry-Perot Filter System
   Advanced Stokes Polarimeter
   Slit-Jaw Camera System
   Correlation Tracker
   Branch Feed Camera System
   Horizontal and Vertical Optical Benches for visitor equipment
   Optical Test Room

Evans Solar Facility (SP)
   40-cm Coronagraphs (2)
   30-cm Coelostat
   40-cm Telescope
   Littrow Spectrograph
   Universal Spectrograph
   Spectroheliograph
   Coronal Photometer
   Dual Camera System

Hilltop Dome Facility (SP)
   H-alpha Flare Monitor
   WhiteLight Telescope
   20-cm Full-Limb Coronagraph
   White-Light Flare-Patrol Telescope (Mk II)
   Sunspot Telescope
   Fabry-Perot Etalon Vector Magnetograph
   Mirror-Objective Coronagraph (5 cm)
   Mirror-Objective Coronagraph (15 cm)

McMathPierce Solar Telescope Facility (KP)
   160-cm Main Unobstructed Telescope
   76-cm East Auxiliary Telescope
   76-cm West Auxiliary Telescope
   Vertical Spectrograph: IR and visible gratings
   Infrared Imager
   Near Infrared Magnetograph
   CCD cameras
   1-m Fourier Transform Spectrometer
   3 semi-permanent observing stations for visitor equipment

Vacuum Telescope (KP)
   Spectromagnetograph
   High-l Helioseismograph
   1083-nm Video Filtergraph

Razdow (KP)
   H-alpha patrol instrument
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**NOAO Newsletter - Global Oscillation Network Group - September 1997 - Number 51**

# Global Oscillation Network Group

The Global Oscillation Network Group (GONG) Project is a community-based activity to operate a six-site helioseismic observing network, do the basic data reduction, provide the data and software tools to the community, and to coordinate analysis of the rich data set that is resulting. GONG data is available to any qualified investigator whose proposal has been accepted; however, active membership in a GONG Scientific Team encourages early access to the data and the collaborative scientific analysis that the Teams are undertaking. Information on the status of the Project, the scientific investigations, as well as access to the data is available on the WWW at www.gong.noao.edu.

Papers analyzing the tachocline at the base of the convection zone, helioseismic constraints on the solar radius, constraining the variation of the gravitational constant, and velocity flows around--and beneath--sunspots are among

those recently submitted that will be highlighted on our URL.

## Operations

The GONG network of instruments continues to demonstrate its reliability, obtaining more than 99% of all possible images during the second quarter of 1997. Of the images that were lost, about one-half resulted from two days of observations somehow vanishing without definitive cause. The data tape in question was in the primary bank and should have been collecting data from the time the tape was inserted until the secondary bank assumed writing data two days later. For reasons not yet understood, the data never made it onto the tape.

About 40% of the lost images were due to condensation forming on the turret optics during the winter months at Big Bear and El Teide. Big Bear suffered the most, and the problem has been addressed by replacing a faulty air dryer. The remaining 10% of the missing images were lost when a power supply breaker tripped at CTIO, and when we suffered failures of both Exabyte tape banks at El Teide. Thanks to the quick response and expertise of the on-site staff, the losses were kept to a minimum.

The reliability of the Exabyte tape drives has considerably improved since we discontinued using a defective batch of head-cleaning cartridges. The cleaning tapes used previously were contaminated with oil, and served only to degrade tape drive performance. Since we distributed the new cartridges, our headaches due to tape drive failures have decreased markedly.

The success of network operations has been due in large part to the efforts of the on-site staff at each of our sites. Their vigilance and willingness to "get their hands dirty" when needed is a major asset to the project.

## Data Management and Analysis

During the past quarter, month-long (36-day) time series and power spectra were produced for GONG months 17, 18, and 19 (ending 970320) with fill factors of 0.92, 0.92, and 0.89. The fill factors for these three months were similar to those for the previous two months (0.91 and 0.94).

The preparation for the reprocessing campaign to regenerate p-mode power spectra from calibrated velocity images has been completed. During the quarter, the project temporarily halted the routine production of month-long p-mode power spectra and reprocessed GONG month 16 with the software and processing parameters that the project intended to use during the reprocessing campaign. After a thorough evaluation of the results and consultation with the project's scientific community through the DMAC Users' Committee, the project began reprocessing.

GONG months 17, 18, and 19 were processed for the first time and GONG months 15 and 16 have been reprocessed with the new p-mode processing parameters and software.

The Field Tape Reader (the subsystem that receives the raw data cartridges from the observing sites) processed 90 cartridges (104 during the previous quarter) containing 563 (606) site-days from the seven instruments. 378 (420) site-days were calibrated. The decrease in the number of site-days calibrated during the quarter is attributed to vacation schedules and the diagnosis and evaluation of a problem that was discovered in the calibration stage.

During the past quarter, the DSDS serviced 11 (13 during the previous quarter) data distribution requests for 3,286 (1,332) files totaling 0.9 (63.2) Gigabytes of data. Each of these data requests were filled during the day on which the request was received.The DSDS performed 1,532 (1,730) data cartridge transactions (library check-ins and check-outs) in response to requests from the data reduction pipeline and other internal operations.

## Data Algorithm Developments

The project has finished implementing the changes to the data processing as described in the previous NOAO Newsletter. The GONG DMAC Users Committee (DUC) met in Tucson on 18 June and approved the changes. Reprocessing is now proceeding both forwards and backwards in time from GONG Month 16. With this strategy the reprocessed time series will grow at the rate of two months per month.

Work continues in the area of spectral fitting, particularly in the areas of the asymmetrical line profile model, the leakage matrix calculation, the detailed modeling of the spectrum, and the development of alternative fitting methods. These are all substantial research efforts. Preliminary results from the wavelet de-noising and multi-taper package indicate that a spectrum produced with these methods will most likely result in improved estimates of the mode parameters.

## Comings and Goings

***Frederic Baudin*** and ***David Freilly-Fraillon*** have both now departed. Frederic has accepted a position at CfA, and David has returned to the Universit de Nice. We wish them well! ***Jim Kennedy***, GONG's project manager from its early years moved "upstairs" on 1 June to become the Operations Manager for the Gemini project. Jim will continue to be based in Tucson for at least the remainder of the calendar year. To effect a smooth transition, the Gemini project has generously agreed to let Jim continue to consult with GONG while he remains in Tucson. We'll all miss Jim. It is impossible to think of the GONG that we have achieved without his major contributions, and we wish him all the best in his new venture. It should be a piece of cake, it's "just" two sites right? ***Rob Hubbard*** has also left GONG. Rob performed a variety of critical roles for the project, beginning as an instrument design specialist, then moving to assistant project manager, and most recently operations manager. He leaves us to join the Breault Research Organization, a Tucson-based optics firm, so will still be "close."

While these changes punctuate GONG's transition from development, production, and deployment, to network operations, Jim and Rob leave in place a reliable, effective network of instruments, and a competent, enthusiastic staff

poised to squeeze science out of the Sun for a solar cycle.

**Looking Forward**

As operations are settling down, and the first major data reprocessing gets underway, we continue to make progress on "peak bagging" and on the development of a replacement camera system. As we get better and better frequency resolution data, it becomes clear that there are more and more things to take into account in the determination of the eigenfrequencies of the solar interior oscillations. The advancement of our techniques will clearly have to involve a renewed community participation. On the camera front, the good news is that a number of acceptable cameras have been identified. We also enjoyed an extremely productive "Red Team Review" of the camera replacement plan, with David Elmore, Sylvain Korzennik, Jesper Schou, Philip Stark, Steven Tomczyk, and Roger Ulrich asking a lot of hard questions, and helping to move that effort forward. The "proof of concept" effort should get started shortly as key positions get filled. Stay tuned!

John Leibacher

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**NOAO Newsletter - US Gemini Program - September 1997 - Number 51**

# The Ongoing Gemini Instrumentation Program: US Participation

A letter was recently sent out to several hundred US astronomers announcing the opportunity to participate in the Gemini instrumentation program. As I could not send the letter to everyone who might have an interest, I asked those who received it to share the information with colleagues. I also want to solicit expressions of interest in response to this article, which summarizes the opportunities for involvement.

As dictated by the international agreement through which the United States participates in the Gemini partnership, approximately one-half of the instrumentation for the Gemini telescopes will be assigned to be built by US institutions. This work will be managed by the United States Gemini Program.

The US Gemini Program is soliciting expressions of interest from those in the community who would like to participate in:

- future discussions of scientific priorities for the Gemini instrumentation program, or
- the design and fabrication of Gemini instruments or parts of instruments.

The specific instruments that have been identified for early consideration are:

1. A bench-mounted fiber-fed high resolution optical spectrograph.
2. A laser guide star adaptive optics system for Gemini South.
3. An AO-optimized near-IR imager/coronagraph.
4. An AO-optimized near-IR multi-object spectrograph.
5. A wide-field near-IR multi-object spectrograph.

These possible future instruments will be prioritized using input from the scientific communities of the partner countries and cost estimates produced by the national Gemini project offices. One or more groups will be contracted to produce complete conceptual designs, and then a group will be selected to finalize the design and fabricate the instrument. More details of this process are given in the letter that was widely distributed.

Anyone interested in participating in the scientific prioritization process or in the design and construction of Gemini instruments should respond by e-mail (tyb@noao.edu), FAX (520-318-8596), or mail (USGP Instrumentation Program, USGP/NOAO, P.O. Box 26732, Tucson, AZ 85726-6732).

Todd Boroson

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# The USGP Instrument Program

The US Gemini instrument program has been active during the past few months. The Gemini Mid-Infrared Imager (MIRI) Announcement of Opportunity netted several Letters of Intent to Propose. Requests for Proposals for the 8-26 m single plate scale imager were distributed 26 June, with a proposal due date of 8 August. The proposals will be reviewed and evaluated in August, with a goal of awarding a contract by November. The MIRI is scheduled to be delivered to the Gemini South site on Cerro Pachon in late 2000. The instrument concept is for an inexpensive, yet capable imager for the mid-infrared region with a minimal upgrade path. Experience with this instrument in the south and with Michelle, an imaging mid-IR spectrograph built by ROE and shared between Gemini and UKIRT in the north, will most likely define the requirements for future Gemini instruments operating in the mid-IR.

The Gemini Near Infrared Imager (NIRI), being built by the Institute for Astronomy of the University of Hawaii, held a two-day Critical Design Review in mid-May. The review committee, chaired by Ian McLean/UCLA, "... *felt that the NIRI Team had done an excellent job and we wish to offer our congratulations. Well done! The optical design and tolerance analysis appears to be very good and should lead (potentially) to remarkable Strehl ratios*." This 1-5 m imager has three plate scales and will be the commissioning instrument for the Gemini North telescope on Mauna Kea. The CDR was followed by a safety review to ensure that the NIRI will not harm personnel, other equipment, or itself during its operational lifetime. The NIRI team has ordered its optics, and team leader Klaus Hodapp expects to deliver the instrument in a little over a year.

NOAO's Engineering and Technical Services project team is making good progress on the Gemini Near Infrared Spectrograph (GNIRS). The team is on schedule with the detailed design, aiming for an Autumn Critical Design Review. Over 200 of the approximately 700 fabrication drawings are complete and have been checked, and the team is making excellent progress in the structural detailed design with the goal of meeting the performance requirements while holding the weight to only two metric tons. All mechanisms are in their final stages of detailed design, with designers interacting with engineers to analyze the designs for flexure and other performance goals. NOAO will deliver the instrument in early 2000.

NOAO is also building the InSb science detector array controllers for both NIRI and GNIRS. The first controller, destined for the NIRI, began hardware integration testing in June and system testing in July. Early results indicate it will have very low noise, and with 32 high speed A/D converters, Instrument Scientist Mike Merrill expects it to meet NIRI's speed requirements. The NIRI controller is scheduled for delivery in October, while the GNIRS team receives its controller a year later.

Hughes Santa Barbara Research Center is on track in its foundry run of 1024 X 1024 InSb arrays for Gemini's near infrared instruments. NOAO is overseeing this contract, which has a goal of obtaining a science grade array for each of the two near IR Gemini instruments, plus a spare. Recent SBRC results in other programs are encouraging for the Gemini run.

NOAO is also organizing the effort to provide the CCDs and controllers for the focal planes of the Gemini optical spectrographs. CCD controllers are being obtained from Robert Leach at San Diego State University. The CCDs, 2048 4608 with 13.5 m pixels, are being purchased from EEV in the UK. The software that connects the controllers to the Gemini instrument control and data handling systems will be a joint effort of the Royal Observatories and NOAO.

Mark Trueblood, Todd Boroson

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**NOAO Newsletter - US Gemini Project - September 1997 - Number 51**

# Gemini Project News - First Light is Approaching

The Project continues to hold to its schedule of a Gemini North "first light" in December 1998.

By the time you read this Newsletter, Gemini should have transported its first three large loads up Mauna Kea from Kawaihae harbor on the northwest side of the Big Island. A road test was successfully completed in late July to verify that a 62 ton load of proper width could negotiate all the twists and turns on the ~ 75 mile journey from sea level to the 14,000 foot summit. As of 1 August, the azimuth track and the two halves of the coating chamber were on schedule to be transported during each of the last three weekends in August.

Although there is still finishing work inside, the Gemini North enclosure appears as a completed dome now (as you can see on the Gemini web page www.gemini.edu). Although visible progress has been virtually nil for the last year at Gemini South in Chile, increased activity is due to begin there in mid-September when contractors gear up for enclosure erection and addition of siding to the support building.

The pace of the Project appears to be quickening as more and more people and hardware arrive in Hilo to support the start of integration activities for Gemini North. You can keep abreast of the latest developments through a new and regularly updated column on the Gemini web page.

Kathy Wood

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**NOAO Newsletter - US Gemini Project - September 1997 - Number 51**

# Gemini Breaks Ground for New Base Facility in Hilo

The start of construction of the Gemini North Telescope Base Facility in Hilo officially began under sunny skies with a ground blessing ceremony on 24 June. The new 14,000 sq.ft. sea level operations support facility for Gemini North, scheduled for completion in April 1998, will provide office space for approximately 40 astronomers, engineers and administrators; laboratories for instrumentation preparation and maintenance; and a center for remote operation of the telescope using a recently installed fiber-optic communications link.

The base facility is located in the University of Hawaii - Hilo University Park adjacent to the Joint Astronomy Centre, the UK base facility for the UKIRT and James Clerk Maxwell telescopes. University Park is also home to facilities for the Japanese Subaru 8-meter telescope, the Caltech Submillimeter Observatory, and in future to facilities for the Smithsonian Astrophysical Observatory Submillimeter Array and the University of Hawaii Institute for Astronomy.

Gemini recently leased office space in downtown Hilo to accommodate new hires and relocating staff from Tucson until the base facility is completed. By September there will be approximately 15 people working in Hilo to support the arrival of the telescope and support equipment, telescope integration, and planning for operations.


**Caption:** "Diggers" at the ceremony using the traditional o'o sticks are (from left to right), Matt Mountain (Gemini, Steve Yamashiro (Hawaii Mayor), William Pearman (UH-Hilo), Pastor Kahalehili, Don Hall (IfA), Wayne van Citters (NSF), and Dick Malow (AURA).

Kathy Wood

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**NOAO Newsletter - Central Computer Services - September 1997 - Number 51**

# NOAO FTP Archives News

The NOAO-Tucson FTP archives were moved to a new server in early June. The new server is a Gateway-2000 P6-200 running the FreeBSD operating system. Our FTP address is still "ftp.noao.edu" but the IP number is now 140.252.1.54.

In other news, the CTIO FTP archives are now being mirrored nightly on the NOAO-Tucson server in the directory "ctio." You may find that this will provide faster access to CTIO files.

There is also a new directory in the NOAO-Tucson archives called "noaoprop." Look here for the LaTeX template and style file for preparing and submitting your next observing proposal to either CTIO or KPNO. These files are now the same for both observatories and are no longer available from the CTIO or KPNO FTP directories.

Jeannette Barnes, Steve Grandi, Tom Ingerson

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**NOAO Newsletter - Central Computer Services - September 1997 - Number 51**

# IRAF Update

A public beta release of IRAF V2.11 was made available in late June. The main purpose for this beta release, aside from providing early testing of IRAF V2.11, was to support a new version of STSDAS from STScI which provides STIS and NICMOS pipeline data reductions. We expect that the final EXPORT version of V2.11 for Solaris and SunOS operating systems will be in distribution by the time this Newsletter is published. We plan to make V2.11 available for all supported IRAF platforms; distributions for these platforms will follow throughout the summer and fall. A brief summary of the V2.11 changes was included in the last issue of this Newsletter (see also http://iraf.noao.edu/v211beta.html). Detailed notes for V2.11 will be available at the time of the EXPORT release.

Much of our effort this past quarter has gone to preparation of IRAF V2.11. This has involved the efforts of the entire group. System integration was performed on the FITS image kernel, the code was extensively reworked and the new kernel was formally installed in IRAF. New versions of RFITS and WFITS with image extension support were added. The image I/O system was modified to add new or revised "imtype" and "imextn" environment variables affecting all image kernels. The IMHEADER task was revised to provide a convenient image directory feature. A number of new world coordinate system function types were added to MWCS, including support for galactic, ecliptic, and super-galactic coordinates. The graphics system (SGI graphics kernel) was enhanced to provide a more nearly publication quality character font, including support for Greek characters. Numerous old and new bugs were fixed. Work continues to update the operating system software of the IRAF platforms so that we can make V2.11 available on all the major platforms as soon as possible following the EXPORT release. Please refer to the summary of changes or the V2.11BETA system notes file for a more complete summary of what has changed.

The other major effort this past quarter was further development of the data handling system for the NOAO Mosaic. Following intensive development of the Mosaic DHS software in the late spring, the first shared risk run with Mosaic took place in early June. Although the data handling system is still in an early state, it includes a functional message bus, a data feed client for the Arcon detector used by the Mosaic, and a Data Capture Agent capable of capturing data during readout and writing multi-extension FITS files to disk. A fairly complete data reduction package MSCRED is available for processing Mosaic data. Although much work on the Mosaic data handling system is planned over the next year, the system is complete enough now to take data, perform quick look data verification, and reduce and tape the data.

Frank Valdes continues to work on the data reduction package for Mosaic. Recent work included support for the T&E and shared-risk observing, updating the software to work with V2.11, and a draft user's guide. Lindsey Davis is continuing to work on the IRAF ASTROMETRY package and related software. Last quarter she completed a new automatic star finding task called STARFIND and a new catalog object finding task called CCFIND which will be part of IRAF 2.11 and are currently available as part of the IMMATCH package. Lindsey has also been heavily involved in

testing sytem changes to the image I/O and world coordinate system routines in preparation for the IRAF 2.11 release.

Rob Seaman has been working on user configuration issues for the Mosaic and on various observing support for both KPNO and CTIO. The "Save the Bits" archive (STB) continues collecting data at both observatories as well as at the Keck Observatory. Lick Observatory has installed the STB software (and dedicated tape drives) and is in the process of providing connections to the archive from pre-existing data acquisition packages. Rob is currently working on the design and implementation of the WIYN Data Archive and Distribution System, which will be based on writable CD-R media using the next version of STB.

The IRAF group will be attending the ADASS Conference in Germany in September. Several papers will be presented on the latest IRAF projects. We also plan to have an IRAF demo highlighting IRAF V2.11, the latest version of X11IRAF, portions of the Mosaic Data Handling System used for CCD data acquisition, and the distributed object and message bus data system framework being developed by NOAO. The IRAF group will be available to answer questions about the various aspects of the IRAF installations, reductions and programming tools. We hope to see you there!

For further information about the IRAF project please see the IRAF Web pages at http://iraf.noao.edu/ or send email to iraf@noao.edu. The adass.iraf newsgroups on USENET provide timely information on IRAF developments and are available for the discussion of IRAF related issues.

Doug Tody, Jeannette Barnes

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**NOAO Newsletter - Central Computer Services - September 1997 - Number 51**

# ADASS '97 Update

Plans for the Seventh Annual Conference on Astronomical Data Analysis Software and Systems (ADASS), to be held 14-17 September 1997 in Sonthofen, Bavaria, Germany, are well underway. The ADASS Conference provides a forum for scientists and programmers concerned with algorithms, software and software systems employed in the processing of astronomical data. ADASS is hosted jointly this year by the Space Telescope European Coordinating Facility and the European Southern Observatory. Conference sponsors include the European Southern Observatory, the European Space Agency, Space Telescope European Coordinating Facility, Sun Microsystems Deutschland, CREASO (IDL Germany), Sybase, DRACO Software, and Pink Aviation Services.

The ADASS '97 Program Organizing Committee consists of the following members: Rudi Albrecht (ST-ECF/ESO), Roger Brissenden (SAO), Tim Cornwell (NRAO), Dick Crutcher (Illinois), F. Rick Harnden - Chair (SAO), George Jacoby (NOAO), Jonathan McDowell (SAO), Jan Noordam (NFRA), Dick Shaw (STScI), Richard Simon (NRAO), Britt SjÃ¶eberg (ST-ECF), Doug Tody (NOAO), and Dave Van Buren (IPAC). The Local Organizing Committee is chaired by Rudi Albrecht.

The Conference program includes invited talks, contributed oral presentations, poster papers, and computer demos. The special topics for this year's Conference include Astrostatistics, Computing Infrastructure, Computational Astrophysics, Educational and Public Information Activities, Future Trends in Astronomical Computing, and Software Systems and Applications. Invited speakers for this year's Conference include:

Carol Christian (STScI)--"NASA Education/Public Outreach & the Internet"

Rick Fisher (Green Bank)--"Real-time Telescope Operation"

Fionn Murtagh (Univ. Ulster)--"Wavelets (on Grey-scale Photograph-like Images)"

Michael Norman (Illinois/NCSA)--"Early Universe Simulation"

John Nousek (Penn State)--"NASA Space Data Environment"

Peter Quinn (ESO)--"ESO S/W Development"

Joe Schwarz (ESO)--"Running Networks with Minimum Manpower"

Lister Staveley-Smith (Parkes)--"AIPS++ for Pipe-line Data Reduction"

Although the final program was still in preparation as this Newsletter article was written, over 125 abstracts have been submitted for either oral presentations or poster papers. In addition 10 computer demonstrations are planned. Five Birds-of-a-Feather (BOFs) sessions are planned: AstroBrowse, AIPS/AIPS++, IRAF/TWG, Scheduling and Pipelines, and

IDL; others are still being considered. BOFs are organized by ADASS participants and are usually about one hour in duration.

The ADASS Conference will be held in Sonthofen, Bavaria, about 100 km southwest of Munich near the Bavarian Alps, at the AllgÃ¤u Stern Hotel. Late registrations for the meeting are being accepted up until 4 September 1997.

The Converging Computing Methodologies in Astronomy (CCMA) Conference will be held in Sonthofen 17-18 September following ADASS '97. Information on this Conference can be found at http://cfa-www.harvard.edu/~kurtz/CCMAFinalConf.html.

Details pertaining to registration, hotel reservations, abstracts, and the ADASS meeting in general are available at the Web page address below.

```
Contact: Britt SjÃ¶eberg
         ST-ECF/ESO
         Karl-Schwarzschlid-Str. 2
         D-85748 Garching bei M\"unchen
         Germany

         e-mail: adass@eso.org
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         Fax: +49-89-32006-480
         WWW: http://ecf.hq.eso.org/adass/
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Rick Harnden, Chair
Program Organizing Committee

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**NOAO Newsletter - Central Computer Services - September 1997 - Number 51**

# NOAO FTP Archives

The FTP archives for the National Optical Astronomy Observatories can be found at the following FTP addresses. Please log in as "anonymous" and use your e-mail address as the password. Alternate addresses are given in parentheses.

```
ftp ftp.sunspot.noao.edu (146.5.2.181), cd pub
   SP software and data products--coronal maps, active region lists, sunspot
   numbers, SP Workshop paper templates, meeting information, SP observing
   schedules, NSO observing proposal templates, Radiative Inputs of the Sun
   to the Earth (RISE) Newsletters and SP newsletters (The Sunspotter).
   The NSO/SP archive can also be reached at http://www.sunspot.noao.edu/ftp/.

ftp ftp.gemini.edu (140.252.15.71), cd pub
   Archives for the Gemini 8-m Telescopes Project.

ftp ftp.noao.edu (140.252.1.54), cd to:

   catalogs---Jacoby et al. catalog, "A Library of Stellar Spectra"; "Catalogue
   of Principal Galaxies"; "Hipparcos Input Catalogue"; "Lick Northern Proper
   Motion Program: NPM1"; "Coud\'e Feed Spectral Library"; "General Catalog of
   Variable Stars, Volumes I-V 4th ed." and "Name-Lists of Variable Stars Nos.
   67-76."

   ctio (ctios1.ctio.noao.edu)---CTIO archives--- Argus and 1.5m BME
   information, 4-m PF plate catalog, filter library, instrument manuals,
   standard star fluxes.  (This archive is a nightly mirror of those files
   on ctios1.)

   fts (argo.tuc.noao.edu, cd pub/atlas)---Solar FTS high-resolution spectral
   atlases.

   gemini_NOAO (orion.tuc.noao.edu, cd pub)---Documents from the US Gemini
   Project Office.

   gong (helios.tuc.noao.edu, cd pub/gong)--- GONG helioseismology software and
   data products---velocity, modulation and intensity maps, power spectra.
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iraf (iraf.noao.edu)---IRAF network archive containing the IRAF
distributions, documentation, layered software, and other IRAF related
files. It is best to login to iraf.noao.edu directly to download large
amounts of data, such as an IRAF distribution.

kpno (orion.tuc.noao.edu)---KPNO archive of filter lists and transmission
data, CCD and IR detector characteristics, hydra (WIYN) information,
KPNO support schedules, 4m PF platelogs, reference documents, and sqiid
data reduction scripts.

kpvt (argo.tuc.noao.edu)---KP VTT solar data productsmagnetic field,
He I 1083 nm equivalent width, Ca II Kline intensity.

noao (gemini.tuc.noao.edu)---Lists of US areacodes and zipcodes, various
LaTeX tidbits, report from Gemini WG on the high resolution optical
spectrograph, etc.

noaoprop---NOAO nighttime observing proposal LaTeX forms.

nso (orion.tuc.noao.edu)---NSO observing forms.

sn1987a---An Optical Spectrophotometric Atlas of Supernova 1987A in the LMC.

tex---LaTeX utilities for the AAS and ASP.

utils---PostScript tools.

wiyn (orion.tuc.noao.edu)---WIYN directory tree containing information
relating to the WIYN Telescope including information relating to the NOAO
science operations on WIYN.
```

The following additional IP numbers are available for the machines mentioned above:

```
argo.tuc.noao.edu    = 140.252.1.21
ctios1.ctio.noao.edu = 139.229.2.1
gemini.tuc.noao.edu  = 140.252.1.11
helios.tuc.noao.edu  = 140.252.26.105
iraf.noao.edu        = 140.252.1.1
orion.tuc.noao.edu   = 140.252.1.22
```

Questions may be directed to: Steve Heathcote (sheathcote@noao.edu) for the CTIO archives, Frank Hill (fhill@noao.edu) for all solar archives, Steve Grandi or Jeannette Barnes (grandi@noao.edu or jbarnes@noao.edu) for all others.

For further information about NOAO, visit the Web at: http://www.noao.edu/.

Jeannette Barnes

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# NOAO Newsletter Staff

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