

# NATIONAL OPTICAL ASTRONOMY OBSERVATORY

## Quarterly Report (4) FY 2001

July 1 – September 30, 2001



*KPNO summer students in the NSF Research Experiences for Undergraduates (REU) program visit the new US Gemini Remote Operations Center at NOAO, August 2001.*

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# **National Optical Astronomy Observatory**

## **Quarterly Report (4) FY 2001**

### **July 1 – September 30, 2001**

This report consists of summary statistics and other data on NOAO observing programs, publications, telescope usage, personnel changes, and visiting scientists for the fiscal quarter ending September 30, 2001. Quarterly highlights for the Media and Public Information, Educational Outreach, and Public Outreach programs, as well as for observatory activities, are also described. The appendices contain a comprehensive list of all PI's and collaborators, program titles, telescopes used, and observing hours associated with this quarter's observing programs.

Scientific highlights and current updates on NOAO initiatives, new capabilities, instrumentation, and operational activities will be published in the upcoming *NOAO Newsletter*, No. 68, December 2001.

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## OBSERVING PROGRAMS BY TYPE

Fifty-two observing programs were carried out at CTIO this quarter; nine of these were thesis programs. At KPNO, total observing programs numbered 33, of which six were thesis programs. At Gemini North, seven US programs were scheduled for classical observing, including one thesis program.

CTIO Observing Programs by Type (US vs Foreign)			KPNO Observing Programs by Type (US vs Foreign)		
<i>Three Months Ending</i>	<i>9/30/01</i>	<i>% Total</i>	<i>Three Months Ending</i>	<i>9/30/01</i>	<i>% Total</i>
Programs (US)	34	65%	Programs (US)	26	79%
Programs (non-US)	9	17%	Programs (non-US)	1	3%
Thesis (US)	7	13%	Thesis (US)	6	18%
Thesis (non-US)	2	4%	Thesis (non-US)	0	0%
<b>Total Programs</b>	<b>52</b>	<b>100%</b>	<b>Total Programs</b>	<b>33</b>	<b>100%</b>

US Gemini Observing Programs by Type		
<i>Three Months Ending</i>	<i>9/30/01</i>	<i>% Total</i>
Programs (US)	6	86%
Thesis (US)	1	14%
<b>Total Programs</b>	<b>7</b>	<b>100%</b>

Comprehensive lists of all PI's, Co-I's, and collaborators, as well as program titles, telescopes used, and observing hours associated with this quarter's observing programs are attached here as Appendices A and B for CTIO and KPNO, respectively.

PI's, Co-I's, and program titles for US science observing programs at the International Gemini Observatory are listed in Appendix C. Those for the HET and MMT, which are Public Access observing programs established through the support of the National Science Foundation, are also included in Appendix C.

Data showing total proposal requests by telescope and over-subscription rates are published in the *NOAO Newsletter*.

## PUBLICATIONS

### Publications Lists on the Web

KPNO Publications Lists for FY 1990 through FY 2001 and CTIO Publications Lists for FY 1995 through FY 2000 are now available on the Web at [www.noao.edu/noao/library/noao2.html](http://www.noao.edu/noao/library/noao2.html).

The KPNO and CTIO bibliographies track publications by fiscal year (Oct. 1–Sept. 30). Each file gives the total number of publications in the list. For KPNO, this number is separated into refereed and non-refereed totals and for FY 2000 also includes journal links.

## Publications Based on Research Using NOAO Facilities

The tables below report the number of publications received by NOAO libraries during the first nine months of FY 2001.

<b>SUMMARY</b> Cerro Tololo Inter-American Observatory Scientific Staff and Visitor Publications (9 months ending 6/30/01)		
<i>Papers authored by:</i>	# Papers	% Total
<b>Visiting and/or CTIO scientists using specified CTIO telescopes*</b>	<b>87</b>	<b>78%</b>
Visiting and/or CTIO scientists using non-specified CTIO telescope	7	6%
CTIO scientists using non-NOAO telescopes	15	14%
CTIO staff theoretical, engineering, CCS, or technical papers	2	2%
<b>Total CTIO Publications (9 mos)</b>	<b>111</b>	<b>100%</b>

<b>DETAIL</b> No. of Publications Based on Data from CTIO Telescopes (Total Papers Specifying CTIO Telescopes = 87)		
<i>Telescope Specified</i>	# Papers**	% Total (87)
4-m	46	53%
1.5-m	19	22%
1.0-m	9	10%
0.9-m	21	24%
Curtis Schmidt	6	7%

**Definitions:**

**# Papers\*\***

*Paper cites this telescope as a source of data. (May mention additional CTIO telescopes and/or non-CTIO telescopes.) Since more than one telescope may be cited as source of data in a single paper, number of telescopes mentioned may exceed total of publications.*

**\*Publications Using NOAO Telescopes\*:**

*Paper cites at least one NOAO telescope as source of data. (May mention additional NOAO telescopes and/or non-NOAO telescopes.) Author is non-NOAO visiting scientist or an NOAO scientist or both in collaboration.*

<b>SUMMARY</b>		
<b>Kitt Peak National Observatory Scientific Staff and Visitor Publications (9 months ending 6/30/01)</b>		
<i>Papers authored by:</i>	# Papers	% Total
<b>Visiting and/or KPNO scientists using specified KPNO telescopes*</b>	<b>104</b>	<b>67%</b>
Visiting and/or KPNO scientists using non-specified KPNO telescope	2	1%
KPNO scientist using non-NOAO telescopes	22	14%
KPNO staff theoretical, engineering, CCS, or technical papers	27	17%
<b>Total KPNO Publications (9 mos)</b>	<b>155</b>	<b>100%</b>

<b>DETAIL</b>		
<b>No. of Publications Based on Data from KPNO Telescopes (Total Papers Specifying KPNO Telescopes = 104)</b>		
<i>Telescope Specified</i>	# Papers**	% Total (104)
4-m	38	37%
WIYN	20	19%
2.1-m	24	23%
Coude Feed	10	10%
0.9-m	22	21%
Burrell-Schmidt	5	5%
1.3-m	2	2%

**Definitions:**

**# Papers\*\***

*Paper cites this telescope as a source of data. (May mention additional KPNO telescopes and/or non-KPNO telescopes.) Since papers using data from multiple telescopes are counted more than once, total of this column will exceed absolute total of publications using KPNO telescope data.*

**\*Publications Using NOAO Telescopes:**

*Paper cites at least one NOAO telescope as source of data. (May mention additional NOAO telescopes and/or non-NOAO telescopes.) Author is non-NOAO visiting scientist or an NOAO scientist or both in collaboration.*

## TELESCOPE USAGE AND PERFORMANCE DATA

### Cerro Tololo Inter-American Observatory (CTIO)

In the quarter ending 30 September 2001, the observing programs of Principal Investigators accounted for 52% of available telescope hours; less than 4% of CTIO telescope time was used by NOAO scientific staff observers. Slightly more than 7% of available telescope hours was allocated to scheduled maintenance (including instrument tests, engineering, and equipment changes).

Total “downtime” for CTIO telescopes (hours lost to weather and equipment problems) was 37%—of this, 36.7% was lost to bad weather and only 0.4% to equipment problems.

CTIO Telescopes % Distribution of Telescope Hours (Scheduled vs. Downtime) July - September 2001						
Telescope	Hours Available	% Hrs. Used By:		% Hrs. Lost To:		% Hrs. To: Scheduled Maintenance
		PI's	Staff	Weather	Equipment	
4-m	1080.8	52.3%	1.1%	32.3%	0.7%	13.7%
1.5-m	1082.2	52.9%	2.1%	37.0%	0.6%	7.4%
0.9-m	1080.4	55.5%	6.2%	36.1%	0.0%	2.2%
0.6-m/0.9m*	263.6	32.3%	11.0%	56.7%	0.0%	0.0%
<b>All Telescopes</b>	<b>3507</b>	<b>51.9%</b>	<b>3.7%</b>	<b>36.7%</b>	<b>0.4%</b>	<b>7.2%</b>

\*Use restricted to dark of the moon.

**Kitt Peak National Observatory (KPNO)**

In the quarter ending 30 September 2001, 43% of total available telescope hours at KPNO went to the observing programs of Principal Investigators; less than 8% were devoted to those of NOAO scientists. Scheduled maintenance (including instrument tests, engineering, and equipment changes) accounted for almost 12% of total telescope hours.

Total “downtime” (hours lost to weather and equipment problems) for KPNO telescopes was 38%. Almost all these lost observing hours were due to bad weather (33%), with 5% lost to equipment problems.

<b>KPNO Telescopes</b> <b>% Distribution of Telescope Hours</b> <b>(Scheduled vs. Downtime)</b> <b>July - September 2001</b>						
Telescope*	Hours Available	% Hrs. Used By:		% Hrs. Lost To:		% Hrs. To: Scheduled Maintenance
		PI's	Staff	Weather	Equipment	
4-m	494	42.7%	4.3%	30.6%	6.3%	16.4%
WIYN	274	70.1%	8.8%	20.1%	0.7%	0.0%
2.1-m	448	25.9%	10.7%	43.1%	6.3%	14.1%
<b>All Telescopes</b>	<b>1216</b>	<b>42.7%</b>	<b>7.6%</b>	<b>32.8%</b>	<b>5.0%</b>	<b>11.8%</b>

\* After an externally reviewed competitive proposal process, operations of the 0.9-m telescope were transferred to the WIYN Consortium on February 1, 2001. The telescope was then closed for refurbishment and resumed science operations in September. KPNO users have access to 40% of the scheduled CCD Mosaic imager time through KPNO’s loan of the instrument to WIYN when it’s not scheduled on the 4-meter.

As of February 1, 2001, the Coudé Feed telescope was closed to general user access. It is used for observation occasionally by special arrangement.

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## OFFICE OF PUBLIC AFFAIRS AND EDUCATIONAL OUTREACH (PAEO)

### Media and Public Information

Two major glossy publications highlighting NOAO's actions to implement the decadal survey were produced by PAEO for distribution to the astronomical community and beyond. A large-format, three-page, fold-out brochure was mailed with all 2,100 copies of the September 2001 *NOAO Newsletter*; an in-depth, 16-page report version was sent to a mailing list of 300 senior astronomers, administrators, and members of Congress. Both publications were also mailed to two dozen senior astronomy news media reporters and to relevant astronomy public affairs offices, including NSF headquarters, NASA headquarters, JPL, STScI, and NRAO.

A July 2<sup>nd</sup> press release regarding the discovery of a Kuiper Belt Object possibly as large as Pluto's moon Charon by Robert Millis of Lowell Observatory and collaborators using the CTIO Blanco 4-m telescope received very strong media coverage, including a widely distributed wire story from the Associated Press (linked from the *New York Times* Web page), USA TODAY, CNN.com, BBC.com, CBS News on-line, the *Arizona Republic* (Phoenix), Space.com, Astronomy.com, and an extended stay as the top astronomy story on *Yahoo News*. (It also spurred a follow-up press release from ESO.)

NOAO was the release point for a Gemini North image of the young star AFGL 2591 and made significant writing contributions to the July 23<sup>rd</sup> press release text. The press release received good coverage by space news Web sites, and its appeal helped the Gemini home page be named as an Internet "Hot Site" by USA TODAY's Web site.

NOAO issued two other press releases (on a galaxy cluster detected by Tyson & Wittman using gravitational lensing, and on an eccentric X-ray binary star system observed by researchers at Georgia State) that both received coverage in the space media and, in the second case, resulted in a six-page story in the *Atlanta Journal-Constitution*.

NOAO and the University of Arizona teamed up to issue a joint press release on September 28 regarding observations of Comet Borrelly from Kitt Peak in support of the NASA-JPL Deep Space 1 spacecraft flyby, which led to a Page 1, Tucson Section story in the *Arizona Daily Star* and coverage on Space.com.

NOAO Deputy Director Todd Boroson was quoted on Page 1 of the July 19 edition of the *Tucson Citizen* newspaper regarding the scientific basis for SETI.

Kitt Peak Director Richard Green was quoted on Page 1 of the Tucson Section of the August 13 edition of the *Tucson Citizen*, regarding the mapping of hydrogen in the early Universe by NASA's FUSE mission.

Kitt Peak was a central element of a full-color, full-page story on Page 1 of the August 21 *Tucson Citizen* regarding the value of dark skies to Tucson and Arizona. The story included a specially arranged photo of Kitt Peak science operations manager John Glaspey.

The September issue of *Sky & Telescope* magazine featured a four-page story on the NOAO Deep Wide-Field Survey, triggered by a January 2001 NOAO press release and large exhibit display image at the January AAS meeting.

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NOAO images were featured seven times as the Web's "Astronomy Picture of the Day." The main image on the NOAO home page was changed three times.

PAEO Web Designer Mark Newhouse's article, "Practical CSS Layout Tips, Tricks and Techniques," was published August 17 at *A List Apart*, an on-line Web design magazine read by over 10,000 Web designers each week. See <http://www.alistapart.com/stories/practicalcss/>.

Mark also attended and spoke at the Web2001 Conference and Exposition in San Francisco from September 4-8. His session, "Arbiters of Style," was well received and featured a panel of industry recognized experts.

<b>Media and Public Information Summary of Server Hits July - September 2001</b>	
Total Image Gallery Web hits	136,097
Total Education Web hits	16,326
Total NOAO Outreach Web hits	71,074
Total NOAO-Tucson Web hits	737,246

### **Educational Outreach**

The inaugural Teacher Leaders in Research-Based Science Education (TLRBSE) workshop took place from July 9-20 with 10 teachers in attendance. The teachers observed at either NOAO/Kitt Peak or NSO/Sac Peak, and participated in extensive focus groups to determine the program content and flow for future years.

Recruitment for the 2002/2003 TLRBSE program is underway, with ads placed in the *NSTA Reports* and *Mercury Magazine*, 2,500 flyers distributed, an online application form developed, and e-mail announcements made on several national newsgroups and lists.

PAEO Web Designer M. Newhouse worked extensively with Sidney Wolff of the NOAO scientific staff to design templates for the proposed new electronic journal, the *Astronomy Education Review*.

The sixth annual Project ASTRO-Tucson workshop was held on September 28-29. Sixty teachers and astronomers were trained in the use of hands-on astronomy activities and methods for the integration of art, writing, science, and inquiry through a focused study of the Moon. The *Arizona Daily Star* published an informative story on the workshop and its NSF sponsorship on Page 1 of the Tucson Section on September 29<sup>th</sup>.

PAEO received notice that their proposal to the NSF Internship in Public Science Education Program was successful. This will provide about \$100,000 over the next three years to work with local teachers on developing improved activities and materials for classroom visits to Kitt Peak, and to develop Web-based and paper instructional materials for disseminating current research results to the K-12 classroom.

The CTIO REU recruitment mailing was sent to 900 institutions in July.

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Preparations are underway for the TLRBSE program officer and 30 past participants in the RBSE Teacher Enhancement Program to attend and present an exhibit at the 2002 NSTA meeting in San Diego.

Outreach Astronomer Travis Rector gave a public talk on astronomical images at Biosphere 2 and another for Kitt Peak docents.

<b>Educational Outreach Summary of Science and Information Requests July - September 2001</b>	
<i>Type/Origin of Request</i>	<i>Number</i>
Total number of brochures mailed	492
Information requests/inquiries about astronomy/ science (telephone, posters, e-mail, bookmarks, and walk-ins)	1,726
Requests/inquiries for use of NOAO images **	127
<b>Total</b>	<b>2,345</b>

\*\*Does not include images downloaded from the NOAO Image Gallery.

## **Public Outreach**

Docent training is almost complete for the 2001 season. A newly expanded curriculum and intensive seven-week training program has been initiated to cover an expanse of subjects related to Kitt Peak and the mission of NOAO.

Public Outreach Manager R. Fedele attended the annual Astronomical Society of the Pacific Conference in St. Paul, MN, representing NOAO and the public programs of the Kitt Peak Visitor Center.

The first in a series of outdoor audio kiosks for the mountain are ready to be deployed. The first test unit will interpret the Mayan mural in front of the Visitor Center. These self-supporting solar kiosks contain batteries and digital audio units, which interpret a particular topic at the push of a button. If all goes well, other units will be placed at various locations on the mountain to enhance the self-guided walking tour.

The Public Outreach Department has redesigned and printed much-needed Nightly Observing Program and Advanced Observing Program brochures. A new staff manual comprehensively covers the policy and procedures for effective management of the Nightly Observing Program.

The following Visitor Center enhancements were completed in the fourth quarter of FY 2001:

- New visitor center benches and chairs were purchased to replace unsafe ones.
- New classroom furniture was purchased for the special hands-on school programs currently being developed.
- A newly expanded donor plaque that highlights contributors to the center and its programs was created; it will be on display in the Visitor Center.

- A colorful and durable new welcome banner featuring the Rosette Nebula was hung outside the Visitor Center, and the old trash receptacles were replaced.
- A new concrete patio was poured to replace previous one, which was both the unsafe and unsightly.

The Astronomical Society of the Pacific's *Mercury Magazine* (July/Aug 2001) ran an eight-page article on the Kitt Peak Visitor Center Advanced Observing Program. *Scientific American*, *Science Travel* ran a July 2001 article on Kitt Peak designed for tourists entitled, "The Universe Atop a Mountain."

Public Outreach staff presented a slide show about the constellations to a fifth-grade class at Desert Springs Academy in Tucson. The class comprised 20 students, who were introduced to the summer night sky and basic astronomy concepts as a way to launch their astronomy unit.

Tennessee State University conducted interviews and filming at the NOAO offices and Kitt Peak as part of a Web-based astronomy course aimed at students attending institutions that do not have comprehensive astronomy programs. Three astronomers were interviewed and footage was obtained of the McMath-Pierce solar telescope, the 2.1-meter telescope, and the Mayall 4-meter telescope.

Public Outreach staff cooperated with the Smithsonian's National Air and Space Museum (NASM) to provide high-resolution images of the Mayall 4-meter telescope and its control room for NASM's new "Explore the Universe" exhibit. Outreach staff also assisted a film crew from the American Museum of Natural History who were gathering footage and interviews for an exhibit on space weather. The crew focused on NSO's Vacuum Telescope at Kitt Peak, where they obtained numerous shots of the telescope in operation and interviewed solar astronomers actively engaged in research.

A group of undergraduate students participating in NASA's Minority University Space Interdisciplinary Network program, managed by South Carolina State University, visited Kitt Peak under the guidance of a faculty astronomer who gave them an extensive tour of the facility. They then visited NOAO headquarters and listened to talks given by NOAO summer students.

PAEO Manager D. Isbell and Public Outreach Coordinator R. Wilson attended a meeting of the SCOPE outreach group at Sunspot, NM, and toured the NSO facilities and their new visitor center.

<b>Kitt Peak Visitor Center Summary of Visitors July - September 2001*</b>	
<i>Group/Program</i>	<i>No. of Visitors</i>
General public tours	3,369
School groups K-12	12
Special tours	15
Nightly Observing Program	499
Advanced Observing Program	12
<b>Total Visitors</b>	<b>3,907</b>

\*Reflects shutdown for the month of August.

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## PERSONNEL, VISITOR, AND OTHER DATA

### Personnel Changes And Visiting Scientists

#### *Hired*

Date	Name	Position	Division/Unit
07/23/01	Derek Guenther	Engineer	ENG

#### *Completed Employment*

08/31/01	Glenn Tiede	Research Associate	NTSS
08/31/01	Joseph T. Mortimer	Safety Officer	CFO
09/10/01	Donald W. Hoard	Research Associate	CTIO
09/10/01	Stefanie Wachter	Assistant Astronomer	CTIO
09/14/01	I. Glen Blevins	Financial Manager	CAS
09/30/01	Roger Smith	Engineering Project Mgr.	CTIO

#### *Changed Status*

07/01/01	Joan Najita	Promoted from Assistant Astronomer to Associate Astronomer	NTSS
07/23/01	Doug Tody	Promoted from Chief Programmer to Technical Director	CCS

#### *Leave without Salary (transferred from CTIO)*

02/26/01	Oliver Wiecha	Engineering Supervisor	NOAO to CTIO-SOAR
04/01/01	Stephen Heathcote	Associate Astronomer/Tenure	CTIO to SOAR
06/01/01	German Schumacher	Sr. Engineer Manager	CTIO to SOAR
07/01/01	Marcela Urquieta	Secretary 2	AOSS to CTIO-SOAR
08/16/01	Victor Krabbendam	Project Engineer	NOAO to CTIO-SOAR

#### *Visiting Scientists (one month or longer)*

12/01/99	Fernando Santoro	FAPESP, Brazil	CTIO
05/01/01	Sandrine Thomas	Ecole Sup.D'Optique	CTIO
05/22/01	Maximilian Strizinger	University of Arizona	CTIO
09/10/01	Jessica Lavine	Union College	CTIO

### Chilean Economic Data

Month Ending	July	August	September
CPI Change	-0.2%	0.8%	0.7%
Cum. Change in CPI FY 2001	2.3%	3.2%	3.9%
Avg. Mo. Peso/Dollar Rate	626.65	664.38	660.57
Monthly Dollars Changed	\$540,000	\$550,000	\$710,000

### NSF Foreign Travel Fund

Quarter Ending	Amount	Foreign Institution Visited
9/30/01	\$0.00	

## APPENDIX A. OBSERVING PROGRAMS—CTIO

**July - September 2001:** Fifty-two scientific programs, including nine thesis programs, were carried out at CTIO during this quarter. Students are indicated by a (T) for thesis students, (G) for non-thesis graduate students, and (U) for undergraduate students. The telescope used and nights assigned (hours worked) are specified. Service Observing programs are denoted by S.O. instead of nights assigned.

### US/Foreign Thesis Programs (9)

M. Gómez (T), L. Infante (Pontificia Universidad Católica de Chile), T. Richtler (Universidad de Concepción, Chile): “*The Occurrence and Distribution of SNe Ia in Early-Type Galaxies.*” 6(40.6)1.5-m

P. Green, B. Wilkes, J. Silverman (T), H. Tananbaum (Harvard-Smithsonian Center for Astrophysics), J. Baldwin, A. LaCluyze (T) (Michigan State University), P. Smith (University of Arizona), B. Jannuzi (National Optical Astronomy Observatory), C. Smith, M. Smith (Cerro Tololo Inter-American Observatory): “*The Optical Properties of Serendipitous Chandra Sources.*” 1(11)4-m

C. Lonsdale, N. Gautier (California Institute of Technology), B. Siana (T) (University of California, San Diego): “*The SIRTf Wide-Area Infrared Extragalactic Survey.*” 7(48)4-m

M. Mobasher (Space Telescope Science Institute), J. Afonso (T) (Imperial College of Science, UK): “*Probing the Global SFR Evolution Using the Sub-mJy Faint Radio Population.*” 1(0)4-m

C. Sneden, I. Ivans (G) (University of Texas at Austin), K. Kinemuchi (T), H. Smith (Michigan State University), B. Pritzl, G. Jacoby (National Optical Astronomy Observatory), A. Sweigart (NASA, Goddard Space Flight Center), M. Catelan (University of Virginia), A. Layden (Bowling Green State University), S. Baird (Benedictine College): “*Metal Abundances and Mixing in Metal-Rich Globular Clusters with Blue Horizontal Branches.*” 1(7)4-m

L. Strolger (T) (University of Michigan), C. Smith, N. Suntzeff, P. Candia, C. Aguilera (Cerro Tololo Inter-American Observatory): “*Late-Time Deep Imaging of Supernova Host Galaxies.*” 3(8.3)1.5-m

S. Wolk (Harvard-Smithsonian Center for Astrophysics), V. Joergens (T), R. Neuhäuser (Max-Planck-Institut für Extraterrestrische Physik, Germany), E. Guenther (Karl-Schwarzschild-Observatorium, Germany): “*Search for an Eclipsing Double-Lined Spectroscopic T Tauri Binary.*” 4(36)0.9-m

H. Yan (T), R. Windhorst, S. Odewahn, S. Cohen (G) (Arizona State University), W. Keel (University of Alabama): “*Searching for  $z \sim 6$  Objects in a  $1^\circ \times 1^\circ$  Field Around the HDF-South.*” 3(36)0.9-m

K. Zwintz (T), W. Weiss (University of Vienna, Austria): “*Pulsation of Pre-Main Sequence Stars in Young Open Clusters.*” 14(118)0.9-m

### US/Foreign Investigator Programs (43)

D. Bennett, S. Rhie (University of Notre Dame), C. Han, Y.-H. Park (G), C. Lee (G) (Chungbuk National University, Korea), B.-G. Park (Korea Astronomy Observatory, Korea), P. Meintjes (University of the Orange Free State, South Africa), K. Cook (Lawrence Livermore National Laboratory), D. Minniti (Pontificia Universidad Católica de Chile): “*Microlensing Planet Search Observations.*” 11(49.8)0.9-m

R. Blum (Cerro Tololo Inter-American Observatory), P. Conti (University of Colorado), A. Daminieli, E. Figueredo (G) (University of Sao Paulo, Brazil): “*A Near Infrared Investigation of Optically Obscured Galactic Giant H II Regions.*” 4(28)4-m

- C. Chiappini (Columbia University), F. Cuisinier (Universidade Federal do Rio Grande do Sul, Brazil), R. Ciardullo (Pennsylvania State University): “*The Galactic Bulge Formation: Abundance Gradients and Metallicity Distribution from Planetary Nebulae.*” 3(36)4-m
- E. Costa (Universidad de Chile), E. Hardy (National Radio Astronomy Observatory), J. Frogel (Ohio State University): “*IR Photometry of Carbon Stars in the SMC: Disentangling Kinematical Populations.*” 4(35)1.5-m
- J. De Buizer (Cerro Tololo Inter-American Observatory), R. Piña (University of Florida): “*A Near-Infrared Imaging Survey of Massive Star Forming Regions Associated with Maser Emission: A Search for Circumstellar Disks.*” 4(12)1.5-m
- C. d’Orgeville, M. Chun, F. Rigaut, R. Flicker (Gemini North Telescope), C. Dainty (Imperial College, UK), B. Gregory, A. Tokovinin, M. Boccas (Cerro Tololo Inter-American Observatory): “*Mesospheric Sodium Layer Monitoring for Laser Guide Star Adaptive Optics Systems in Chile (II).*” 7(55)0.9-m, 7(58)CS
- M. Dickinson, M. Giavalisco (Space Telescope Science Institute), A. Renzini (European Southern Observatory, Germany), D. Stern (Jet Propulsion Laboratory), C. Winge, M. Ledlow (Gemini South Telescope): “*U- and I-Band Imaging of the CDF-S in Support of the “GOODS” SIRTf Legacy Program.*” 5(56)4-m
- S. Eikenberry (Cornell University): “*Infrared Spectroscopy of LBV 1806-20 and Nearby Massive Stars.*” 2(21)4-m
- G. Garmire, G. Pavlov, A. Garmire, D. Sanwal (Pennsylvania State University): “*Unveiling the Nature of the Enigmatic Central Object of the RCW 103 Supernova Remnant.*” 2(19)4-m
- D. Geisler, W. Gieren, J. Arenas, J. Seguel (G), R. Muñoz (G) (Universidad de Concepción, Chile), V. Smith (University of Texas, El Paso), S. Majewski (University of Virginia): “*Photometric and Spectroscopic Followup of Space Interferometry Mission Grid Giant Star Candidates.*” 15(108)0.9-m
- R. Gray, M. McFadden (Appalachian State University): “*Spectroscopy of Nearby Stars Earlier than MO South of –30 Dec.*” 8(80.5)1.5-m
- P. Hall (Pontificia Universidad Católica de Chile): “*Determining the Fraction of Dust-Reddened Quasars Using 2MASS.*” 6(66)1.5-m
- S. Hameed, R. Walterbos (New Mexico State University), D. Thilker (National Radio Astronomy Observatory), N. Devereux (Embry-Riddle Aeronautical University): “*HII Region Luminosity Functions of Spiral Galaxies.*” 6(64)1.5-m
- T. Henry, W.-C. Jao (G) (Georgia State University), M.T. Ruiz, L. González, E. Costa (Universidad de Chile), P. Ianna, M. Begam, R. Pujals, J. Subasavage (University of Virginia), R. Méndez (European Southern Observatory, Chile), P. Seitzer (University of Michigan), A. Miranda, R. Leiton (Cerro Tololo Inter-American Observatory): “*In Search of Nearby Stars: A Parallax Program at CTIO.*” 5(21.5)1.5-m, 12(93)0.9-m
- T. Henry (Georgia State University), L. Walkowicz (U), D. Golimowski (Johns Hopkins University): “*CTIOPI: Nearby Star Suspects.*” 3(1)4-m
- D. Hoard, S. Wachter (Cerro Tololo Inter-American Observatory): “*Variability and System Parameters of the Double-Lined Cataclysmic Variable Phe 1.*” 1(0)0.9-m
- M. Holman (Harvard-Smithsonian Center for Astrophysics), J.-M. Petit, B. Gladman (Observatoire de la Cote d’Azur, France), J. Kavelaars (McMaster University, Canada), T. Grav (G) (University of Oslo, Norway), P. Nicholson (Cornell University): “*A Search for Small Distant Moons of Neptune.*” 4(43.8)4-m
- C. Impey, C. Petry (University of Arizona): “*Investigating the Connection Between Low Redshift Lyman- $\alpha$  Absorbers and Galaxies.*” 4(25)4-m

- D. James (University of Wisconsin, Madison), J. Barnes, A. Collier-Cameron (University of St. Andrews, UK): *"Differential Rotation on the M-Dwarf HK Aqr."* 4(17)4-m
- R. Kennicutt, J. Funes (University of Arizona), S. Sakai (University of California, Los Angeles): *"Star Formation in the Local Universe."* 4(24)0.9-m
- A. Landolt (Louisiana State University): *"UBVRI Photoelectric Photometric Sequences."* 17(106.6)1.5-m
- M. Ledlow (Gemini South Telescope), G. Morrison (California Institute of Technology), F. Owen (National Radio Astronomy Observatory), N. Miller (NASA, Goddard Space Flight Center): *"An Evolutionary Sequence of Cluster Evolution, Star Formation, and Galaxy Activity: An Optical/Radio/X-Ray Study."* 6(32)1.5-m
- H. Lee (G) (York University, Canada), P. Hodge, D. Zucker (G) (University of Washington), A. Dolphin (National Optical Astronomy Observatory), E. Grebel (Max-Planck-Institute for Astronomy, Germany): *"Oxygen Abundances for Dwarf Galaxies in Nearby Groups and in the Field."* 4(21.5)1.5-m
- B. Mason, W. Hartkopf, T. Rafferty, S. Urban (U.S. Naval Observatory), T. Henry (Georgia State University), D. Soderblom (Space Telescope Science Institute): *"A Multiplicity Survey of Nearby G Dwarf Stars."* 4(44)4-m
- P. Massey (Lowell Observatory), P. Hodge (University of Washington), G. Jacoby, A. Saha (Kitt Peak National Observatory), N. King (Space Telescope Science Institute), K. Olsen, C. Smith, C. Aguilera (Cerro Tololo Inter-American Observatory): *"The Resolved Stellar Content of Local Group Galaxies Currently Forming Stars."* 3(34)0.9-m
- M. Mateo, R. Dohm-Palmer (University of Michigan), H. Morrison (Case Western Reserve University), E. Olszewski, P. Harding (G) (University of Arizona), K. Freeman, J. Norris (Australian National University, Australia), A. Helmi (Max-Planck Institut fuer Extraterrestrische Physik, Germany), S. Szechtman (Carnegie Observatories), J. Arabadjis (Massachusetts Institute of Technology), C. Sneden (University of Texas, Austin): *"Substructure in the Galactic Halo – The Imaging Survey."* 6(11.5)1.5-m
- G. Meurer (Johns Hopkins University), H. Ferguson, P. Knezek, S. Oey (Space Telescope Science Institute), R. Webster, M. Drinkwater, V. Kilborn, M. Meyer (University of Melbourne, Australia), R. Kennicutt (University of Arizona), C. Smith (Cerro Tololo Inter-American Observatory), K. Freeman, M. Putman (Australian National University, Australia), L. Staveley-Smith (Australia Telescope National Facility, Australia): *"Star Formation in HI Selected Galaxies."* 3(35.5)1.5-m
- R. Millis, M. Buie, L. Wasserman (Lowell Observatory), E. Chiang (Institute for Advanced Study), J. Elliot, S. Kern (G) (Massachusetts Institute of Technology), D. Trilling (University of Pennsylvania), M. Wagner (University of Arizona): *"Deep Ecliptic Survey."* 4(36)4-m
- D. Minniti, F. Courbin, E. Labbe (G) (Pontificia Universidad Católica de Chile), W. van Breugel, W. de Vries (Lawrence Livermore National Laboratory), M. Reuland (G), H. Röttgering (Leiden University, The Netherlands): *"Near-IR Studies of High Redshift Radio Galaxies."* 1(9)4-m
- B. McLean, J. Morrison (Space Telescope Science Institute), J. García (Gemini Observatory), B. Bucciarelli (Osservatorio Astronomico di Torino, Italy), E. Costa (University of Chile): *"Photometric Calibrators for the Second Generation Guide Star Catalog."* 7(56.3)0.9-m
- R. Nichol (Carnegie Mellon University), P. Fischer (University of Toronto, Canada), J. Frieman, M. Joffe, D. Johnstone (G) (University of Chicago), T. McKay (University of Michigan), J. Mohr (University of Illinois): *"Weak Lensing by Nearby Clusters of Galaxies: A Complete Sample of Clusters."* 4(24)4-m
- R. O'Dell (Vanderbilt University), T. Doi (G), H. Doi (Rice University): *"Structure and Motions within the Helix Planetary Nebula."* 4(12)4-m

J. Rhoads (Space Telescope Science Institute), S. Malhotra (Johns Hopkins University), D. Stern (Jet Propulsion Laboratory): “*The Large Area Lyman Alpha Survey.*” 5(36)4-m

M.T. Ruiz, F. Castander, E. Treister (G) (Universidad de Chile), R. Méndez, C. Lidman (European Southern Observatory, Chile), W. van Altena (Yale University): “*A Large-Volume Survey of Halo White Dwarfs.*” 2(24)4-m

A. Sarajedini (University of Florida), A. Layden (Bowling Green State University): “*The Star Formation and Chemical Enrichment History of the Sagittarius Dwarf Galaxy.*” 3(15)4-m

J.A. Smith (University of Michigan), D. Tucker (Fermi National Accelerator Laboratory): “*Southern Standard Stars for the u’g’r’i’z’ System.*” 7(45.5)0.9-m

J. Stock (Centro de Investigaciones de Astronomía, Venezuela), J. Stock (University of Zulia, Venezuela): “*Objective Prism Survey at the South Galactic Pole.*” 8(18)CS

N. Suntzeff, C. Smith, K. Krisciunas, P. Candia (Cerro Tololo Inter-American Observatory), M. Phillips (Las Campanas Observatory, Chile), M. Hamuy (G) (University of Arizona), D. DePoy (Ohio State University): “*Near-Infrared and Optical Light Curves of Bright Supernovae.*” 2(11)0.9-m

E. Terlevich, I. Aretxaga (Instituto Nacional de Astrofísica, Óptica y Electrónica, México), R. Terlevich, G. Cotter (University of Cambridge, UK), A. Díaz (Universidad Autónoma de Madrid, España), R. Hunstead (University of Sydney, Australia): “*The Stellar Populations of FR II Radiogalaxies.*” 3(20)4-m

S. Wachter (Cerro Tololo Inter-American Observatory), R. Bandyopadhyay (Naval Research Laboratory), G. Brammer (U) (Williams College), K. Cooksey (U) (Valparaiso University), B. Johnson (U) (University of California, Los Angeles): “*An IR Survey of X-Ray Binaries: Characterizing the IR Emission of Accretion Disks.*” 1(0)4-m

G. Wallerstein, G. Gonzalez (University of Washington): “*Abundances of O and N from OH and NH Bands in Metal-Poor Red Giants.*” 5(44)4-m

J. Willis, H. Quintana, G. Galaz (Pontificia Universidad Católica de Chile), M. Pierre (Centre d’ Etudes de Saclay, France): “*An Optical/NIR Study of the X-Ray Multi-Mirror (XMM) Large Scale Structure (LSS) Survey Field.*” 6(60)1.5-m

MICHIGAN Program: P. Seitzer (University of Michigan). 8(38.1)CS

## APPENDIX B. OBSERVING PROGRAMS—KPNO

**July - September 2001:** During this period, 33 scientific programs, 6 of which were thesis programs, were carried out. Graduate and undergraduate students are indicated by a (T) for thesis students, (G) for non-thesis graduate students, and (U) for undergraduate students.

### US/Foreign Thesis Programs (6)

#### The Optical Properties of Serendipitous Chandra Sources

P. Green, B. Wilkes (Harvard-Smithsonian Center for Astrophysics), J. Baldwin (Michigan State University), P. Smith (University of Arizona), B. Jannuzi (National Optical Astronomy Observatories), J. Silverman (T) (Smithsonian Astrophysical Observatory), A. Lacluyze (T) (Michigan State University), C. Smith (CTIO), H. Tananbaum (Harvard-Smithsonian Center for Astrophysics) WIYN 3n (27 hrs)

#### Galaxies Near Distant Damped Ly(alpha) Clouds

J. Lowenthal (University of Massachusetts), N. Bouche (T) (University of Massachusetts at Amherst) 4m 3n (31 hrs)

#### Finding the Neighbors

I. Reid, K. Cruz (T) (University of Pennsylvania), D. Monet (U.S. Naval Observatory), J. Gizis (IPAC, JPL/IAPC), J. Liebert (University of Arizona), J. Kirkpatrick (IPAC, JPL/IAPC), C. Cooper (G), N. Gorlova (G) (University of Arizona) 4m 9.5n (63 hrs)

#### Disk Evolution in Cep OB2 Clusters Tr37 and NGC7160

A. Sicilia-Aguilar (T), L. Hartmann (Harvard-Smithsonian Center for Astrophysics), J. Muzerolle (University of Arizona), C. Briceno (Centro de Investigación de Astronomía) 2.1m 3n (17 hrs)

#### Cluster Survey of Protoplanetary Disk Evolution

A. Sicilia-Aguilar (T), L. Hartmann (Harvard-Smithsonian Center for Astrophysics), J. Muzerolle (University of Arizona), C. Briceno (Centro de Investigación de Astronomía) WIYN 3n (0 hrs)

#### Local Lyman (alpha) Forest: Tracing Large-Scale Structure with Absorbers and Galaxies

J. Stocke, K. McLin (T), S. Penton, J. Shull (University of Colorado), T. Rector (National Optical Astronomy Observatories) WIYN 3n (4 hrs)

### US/Foreign Investigator Programs (27)

#### Discovering Planets in Star Clusters

S. Barden, C. Pilachowski (National Optical Astronomy Observatories), R. Mathieu (University of Wisconsin, Madison), D. Harmer (National Optical Astronomy Observatories) WIYN 1n (0 hrs)

#### Discovering Planets in Star Clusters

S. Barden, C. Pilachowski (National Optical Astronomy Observatories), R. Mathieu (University of Wisconsin, Madison), D. Harmer (National Optical Astronomy Observatories) WIYN 4n (14.5 hrs)

#### Formation and Evolution of the Galactic Halo: Refining the Timescale Resolution

B. Carney (University of North Carolina, Chapel Hill), I. Ivans (G), C. Sneden (University of Texas, Austin), J. Laird (Bowling Green State University), M. Brewer (G) (University of North Carolina-Chapel Hill) 4m 5n (25.5 hrs)

#### The Formation and Evolution of M33 From Star Cluster Properties

R. Chandar (Johns Hopkins University), A. Sarajedini (University of Florida), L. Bianchi, H. Ford (Johns Hopkins University) WIYN 3n (10 hrs)

The MEGA Survey: Mapping Microlensing in M31

A. Crotts, R. Uglesich (G) (Columbia University), G. Gyuk (University of California, San Diego), A. Gould (Ohio State University), P. Sackett (Kapteyn Astronomical Institute), L. Widrow (Queen's University), K. Kuijken (Kapteyn Astronomical Institute) 4m 1n (11 hrs)

Long-Term Monitoring of Dynamical Motions in Accretion Disks of AGNs

M. Eracleous (Pennsylvania State University), J. Halpern (Columbia University), T. Storchi-Bergmann (Universidade Federal Rio Grande do Sul), S. Gallagher (G) (Pennsylvania State University) 2.1m 4n (15.5 hrs)

From Molecular Cores to Planets

N. Evans (University of Texas, Austin), D. Koerner (University of Pennsylvania), E. Jensen (Swarthmore College), N. Bonaventura (U) (Pennsylvania State University) 4m 2.5n (7 hrs)

Binary Frequency and Rotational Velocities of Very Young OB Stars in M17

D. Gies (Georgia State University), P. Conti (University of Colorado), P. Massey (Lowell Observatory), L. Penny (College of Charleston), W. Huang (G), D. Wallace (G) (Georgia State University), S. Holmes, J. Vukovich (Northern Arizona University) WIYN 6n (43.5 hrs)

Searching for the Nearest Young Stars

E. Jensen (Swarthmore College), D. Koerner (University of Pennsylvania), B. Biller (Harvard-Smithsonian Center for Astrophysics), A. Dullighan (U) (Swarthmore College) 4m 1n (0 hrs)

The Radio Supernova Remnants and H II Regions in NGC 6946

C. Lacey (University of South Carolina), S. Van Dyk (California Institute of Technology) 4m 3n (17 hrs)

A Multiplicity Survey of Nearby G Dwarf Stars

B. Mason, W. Hartkopf (U.S. Naval Observatory), T. Henry (Johns Hopkins University), T. Rafferty (U.S. Naval Observatory), D. Soderblom (Space Telescope Science Institute), S. Urban (U.S. Naval Observatory) 4m 1n (0 hrs)

The Resolved Stellar Content of Local Group Galaxies Currently Forming Stars

P. Massey (Lowell Observatory), P. Hodge (University of Washington), N. King (T) (Space Telescope Science Institute), A. Saha (National Optical Astronomy Observatories), G. Jacoby (WIYN), K. Olsen, C. Smith (National Optical Astronomy Observatories) 4m 6n (48.5 hrs)

The Wolf-Rayet Content of the Local Group Starburst Galaxy IC10

P. Massey (Lowell Observatory) 4m 2n (22 hrs)

Rotation of B-type Stars in  $\eta$  &  $\chi$  Persei (NGC 869/884)

J. Mermilliod (Universite of Lausanne), C. Melo (Geneva Observatory), P. North (Universite of Lausanne), F. Royer (Geneva Observatory), R. Mathieu (University of Wisconsin, Madison) WIYN 2n (16 hrs)

Mapping the Small-Scale ISM: The Andromeda Project

D. Meyer, J. Lauroesch, S. Andrews (U) (Northwestern University), K. Roth (Gemini Observatory) WIYN 3n (25 hrs)

Deep Ecliptic Survey

R. Millis, M. Buie (Lowell Observatory), E. Chiang (Institute for Advanced Study), J. Elliot, S. Kern (G) (Massachusetts Institute of Technology), D. Trilling (University of Pennsylvania), R. Wagner (Steward Observatory), L. Wasserman (Lowell Observatory), E. Ryan (U) (Massachusetts Institute of Technology) 4m 3n (7 hrs)

<u>Formation of Galaxy Spheroids - Constraints from the Nearest Large Bulge</u> H. Morrison, D. Hurley-Keller (Case Western Reserve University), P. Harding (G) (University of Arizona), G. Jacoby (WIYN)	WIYN	1n	(9 hrs)
<u>Nuclear Lightcurve Observations of Short Period Comets</u> B. Mueller, N. Samarasinha, T. Lauer (National Optical Astronomy Observatories), M. Belton (Belton Space Exploration Initiatives, LLC)	2.1m	7n	(53.5 hrs)
<u>RBSE Observing</u> T. Rector (National Optical Astronomy Observatories), S. Burke (Woonsocket High School), R. Groover (Bordentown Regional High School), A. Maciolek (North High School), L. Stefaniak (Allentown High School), C. Walker (National Optical Astronomy Observatory), J. Lockwood (Sahuaro High School), M. Young (M. J. Young & Associates), P. Boley (Plymouth, MI), D. Norman (CTIO)	2.1m	3n	(14 hrs)
<u>The Pulsational Properties of Type II Cepheid Variable Stars</u> E. Schmidt, K. Lee (University of Nebraska)	2.1m	7n	(32.5 hrs)
<u>The Nature of LINER's</u> H. Schmitt (National Radio Astronomy Observatory), R. Fernandes, T. Heckman (Johns Hopkins University), C. Leitherer (Space Telescope Science Institute), T. Storchi-Bergmann (Universidade Federal Rio Grande do Sul), R. Delgado (Instituto Astrofisico de Andalucia)	2.1m	4n	(14 hrs)
<u>REU Student Observing</u> N. Sharp, K. Mighell (National Optical Astronomy Observatories), H. Jacobson (U) (University of Texas, Austin), V. Mikles (U) (Johns Hopkins University), J. Pina (U) (University of Arizona), S. Ammons (U) (Duke University), M. Grabelsky (U) (Rice University), M. Miller (U) (Macalester College), T. Nelvin (U) (University of South Carolina), D. Isquith (U) (Yale University), D. Wik (U) (Ohio University), E. Klein (U) (Brandeis University), S. Robinson (U) (Rochester Institute of Technology), V. Davis (U) (University of South Carolina), K. Dunn (U) (New Mexico State University), D. Raymondson (U), S. Flynn (U), R. Rosengard (U), V. Valentine (National Radio Astronomy Observatory)	2.1m	12n	(18 hrs)
<u>High Resolution Spectroscopy of Protoplanetary Disks in Herbig Ae/Be Systems</u> M. Van Den Ancker (Harvard-Smithsonian Center for Astrophysics)	4m	2n	(0 hrs)
<u>The Cosmic Evolution of Starburst Galaxies and AGN from the Largest ISO Survey</u> B. Vila-Vilaro (University of Arizona), I. Perez-Fournon (Instituto de Astrofisica de Canarias), E. Gonzalez-Delgado (Instituto de Astrofisica de Andalucia), F. Cabrera-Guerra (Instituto de Astrofisica de Canarias), M. Rowan-Robinson, J. Stock (Imperial College), C. Willott (Instituto de Astrofisica de Canarias), S. Oliver (Imperial College)	WIYN	4n	(20.5 hrs)
<u>Imaging of Dwarf Galaxy Candidates</u> A. Whiting (U. S. Naval Academy), G. Hau (Universidad Catolica de Chile), M. Irwin (Institute of Astronomy)	2.1m	1n	(0 hrs)
<u>Faint Photometric Standard Fields for HST and Large Ground-Based Telescopes</u> B. Whitmore (Space Telescope Science Institute), A. Saha (National Optical Astronomy Observatories), P. Stetson (Dominion Astrophysical Observatory), S. Casertano, R. Bohlin (Space Telescope Science Institute), A. Dolphin (National Optical Astronomy Observatories)	WIYN	2n	(19 hrs)
<u>Spectroscopy of Tidal Candidate Stars Associated with the Globular Cluster NGC 6934</u> R. Wilhelm, K. Silverthorne (U), L. Groning (G) (Southwestern University)	WIYN	3n	(28 hrs)

## APPENDIX C. OBSERVING PROGRAMS—GEMINI, HET, AND MMT

### GEMINI (International Gemini Observatory)

**July - September 2001:** During this period, observations were obtained at the International Gemini Observatory for the following US programs:

***“Direct Imaging of Very Low Mass Companions”***

L. Close, J. Liebert, A. Burrows, M. Meyer, Steward Observatory

***“The Sub-Kiloparsec Structure of the Most Massive High-Redshift Galaxies”***

Andrew Zirm (T), Johns Hopkins University; M. Dickinson, Space Telescope Science Institute; A. Dey, National Optical Astronomy Observatory; M. Chun and B. Ellerbroek, Gemini Observatory

***“Search for Asteroidal Satellites Using Adaptive Optics”***

W. Merline, Southwest Research Institute; L. Close, Steward Observatory; C. Dumas, JPL/California Institute of Technology; C. Chapman, Southwest Research Institute; F. Menard, CFHT; D. Slater, Southwest Research Institute; J. Chris Shelton, Mt. Wilson Observatory

**HET (Hobby-Eberly Telescope at McDonald Observatory):** This is the fourth quarter during which observations have been obtained at the Hobby-Eberly telescopes under the Public Access program established through the support of the National Science Foundation. Under this agreement, 162 nights will be made available to the astronomical community through NOAO for at least six years. Since the HET is queue-scheduled, this number of nights is equivalent to 168 hours per year of actual data collection, once the Hobby-Eberly telescope is in full operation.

**July - September 2001:** During this period, observations were obtained for the following science programs:

***“Lithium-rich Giants in Globular Clusters”***

C. Pilachowski, National Optical Astronomy Observatory; C. Sneden, University of Texas at Austin; S. Wolff, National Optical Astronomy Observatory

**MMT (6.5-m Telescope of the MMT Observatory):** This is the second quarter during which observations have been scheduled at the 6.5-m telescope of the MMT Observatory under the Public Access program established through the support of the National Science Foundation. Under this agreement, 162 nights will be made available to the astronomical community through NOAO for at least six years. When the 6.5-m telescope is in full operation, the community can expect to receive 27 nights per year.

**July - September 2001:** During this period, no observations were obtained under the Public Access program.