NATIONAL SOLAR OBSERVATORY



NSO Quarterly Report (2) FY 2007 January 1, 2007 – March 31, 2007

Submitted to the National Science Foundation Under Cooperative Agreement No. AST-0132798 Scientific Program Order No. 2

Also published on the NSO Web site: http://www.nso.edu





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This report consists of summary statistics and other data on NSO observing programs and telescope usage, and a safety report for the fiscal quarter ended March 31, 2007. Quarterly highlights of public and educational outreach activities are also described. The appendix contains a comprehensive list of principal investigators and collaborators, program titles, telescopes used, and observing hours associated with the quarter's observing programs.

Scientific highlights and current updates on NSO initiatives, new capabilities, instrumentation, and operational activities are published separately in the quarterly *NOAO-NSO Newsletter*.

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I. Observing Programs*

17 observing programs, four of which were thesis programs, were carried out at NSO this quarter. A comprehensive list of PI's, Co-I's, and collaborators, as well as program titles, telescopes used, and observing hours associated with the quarter's observing programs is attached as the Appendix.

NSO Observing Programs by Type (US vs Foreign)				
3 Months Ending Mar 2007	Nbr	% Total		
Programs (US)	11	65%		
Programs (non-US)	2	12%		
Thesis (US)	2	12%		
Thesis (non-US)	2	12%		
Total Number of Unique Science Projects*	17	100%		

*Includes observing programs conducted by NSO/NOAO staff scientists.

Users of NSO Facilities by Category						
		Vis	NSO/NOAO Staff			
	US Non-US Total % Total					
PhDs	12	6	18	75%	8	
Graduate Students	2	2	4	17%	0	
Undergraduate Students	0	0	0	0%	0	
Other	1	1	2	8%	3	
Total Users 15 9 24 100% 11						

Institutions Represented by Visiting Users**					
	US	Non-US	Total	% Total	
Academic	5	3	8	62%	
Non-Academic	3	2	5	38%	
Total Academic & Non-Academic	8	5	13	100%	

**Note: Total number of institutions represented by users do not include departments or divisions within an institution as separate entities (e.g., US Air Force and NASA are each counted as one institution even though several different sites/bases/centers are separately listed in the data base).

INSTITUTIONS REPRESENTED BY USERS
Foreign Institutions (5)
ETH, Zurich, Switzerland
INAF - Arcetri Astrophysical Observatory, Italy
Instituto de Astrofisica de Andalucia, Spain
Queen's University, Belfast, Ireland
Universidad de Monterrey, Mexico
US Institutions (8)
CMA Consulting
NASA Ames Research Center
NASA Goddard Space Flight Center
New Jersey Institute of Technology/Big Bear
Solar Observatory
University of Hawaii
University of Maryland
University of Washington
University of Wisconsin-Madison
US Air Force/Philips Lab (USAF/PL/GSS)

Number of Users by Nationality				
Ireland	3	Spain	2	
Italy	2	Switzerland	1	
Mexico	1	United States	26	

II. Telescope Usage and Performance Data

In the quarter ending March 31, 2007, 39.7% of total available telescope hours at NSO/Sacramento Peak and NSO/Kitt Peak went to the observing programs of visiting principal investigators and synoptic programs; 21.5% were devoted to the programs of NSO and NOAO scientists. Scheduled maintenance, including instrument tests, engineering, and equipment changes, accounted for 9.9% of total allotted telescope hours.

Total "downtime" (hours lost to weather and equipment problems) for NSO telescopes was 28.9%. 27.4% of these lost observing hours were due to bad weather, with 1.5% lost to equipment problems.



*Includes synoptic/archival data made immediately available to scientific community at large.

NSO TELESCOPES Percent Distribution of Telescope Hours (Scheduled vs. Downtime) January 1, 2007 - March 31, 2007						
T .1		% Hours Used By:		% Hours	s Lost To:	% Hrs. Lost To:
Telescope	Hours Available	Visitors ^a	Staff	Weather	Equipment	Scheduled Maintenance
Dunn Solar Telescope/SP	774.0	19.8%	16.4%	26.9%	0.0%	37.0%
McMath-Pierce*	1,879.0	47.0%	26.4%	24.3%	2.3%	0.0%
KP SOLIS Tower ^Ď	0.0	0.0%	0.0%	0.0%	0.0%	0.0%
FTS Lab ^c *	0.0	0.0%	0.0%	0.0%	0.0%	0.0%
Evans Facility	246.0	46.3%	0.0%	52.8%	0.8%	0.0%
Hilltop Dome 0.0		0.0%	0.0%	0.0%	0.0%	0.0%
All Telescopes 2,899.0 39.7% 21.5% 27.4% 1.6% 9.9%						

^a Includes synoptic programs for which all data are made available immediately to the public and the scientific community at large.

^b Formerly the Kitt Peak Vacuum Telescope (KPVT), which was closed on 22 Sept 2003 to prepare for SOLIS.

^c Shut down this quarter for repairs/upgrade.

^{*}*Totals include both day and night hours. (All others are day only.)*

III. User Statistics – Archives/Data Bases

A. NSO/Sacramento Peak (NSO/SP)

Combined FTP & WWW Service Demographics (NSO/SP)				
Demographic Group	Requests	Traffic		
U.S. Science (.gov, .edu, .mil)	45.9%	47.1%		
Other U.S. (.com, .net, misc.)	44.7%	43.1%		
Foreign	9.4%	9.8%		
Unresolved	0.0%	0.0%		
Total	100.0%	100.0%		

FTP Archive Statistics

There were 270,988 successful user requests, serving 4,588 distinct files to 4,820 distinct hosts. A total of 40.209 Gbytes were served, averaging 457.634 Mbytes per day.

FTP User Demographics (NSO/SP)					
Demographic Group	Requests	Traffic			
U.S. Science (.gov, .edu, .mil)	57.2%	59.6%			
Other U.S. (.com, .net, misc.)	32.5%	29.6%			
Foreign	10.3%	10.8%			
Unresolved	0.0%	0.0%			
Total	100.0%	100.0%			

FTP Products (NSO/SP)				
Product	Requests	Traffic		
Realtime Images	3.3%	4.7%		
Corona Maps	92.7%	83.9%		
Staff Outgoing	0.4%	4.4%		
OSPAN Data Archive	3.1%	6.7%		
Other	0.5%	0.3%		
Total	100.0%	100.0%		

World Wide Web Statistics

There were 1,205,686 successful user requests, serving 40,459 distinct files to 44,162 distinct hosts. A total of 99.358 Gbytes were served, averaging 1.104 Gbytes per day.

WWW User Demographics (NSO/SP)				
Demographic Group	Requests	Traffic		
U.S. Science (.gov, .edu, .mil)	44.2%	42.1%		
Other U.S. (.com, .net, misc.)	46.4%	48.6%		
Foreign	9.4%	9.3%		
Unresolved	0.0%	0.0%		
Total	100.0%	100.0%		

Note: Sac Peak statistics exclude the use of NSO archives and data bases from within the NSO/Sac Peak Local Area Network (LAN), from the NSO/Tucson LAN, and from NOAO as a whole.

WWW Products (NSO/SP)				
Product	Requests	Traffic		
Realtime Images and Movies				
(OSPAN, Other)	35.3%	42.2%		
Other Images	1.4%	1.8%		
Icon and Background Images	18.8%	1.2%		
Public Relations Pages	2.2%	0.4%		
Press Releases	3.3%	9.2%		
Telescope Home Pages	3.4%	0.9%		
OSPAN Project Pages	4.3%	0.7%		
SMEI Experiment & Data Pages	14.7%	33.6%		
Adaptive Optics Pages	0.5%	0.8%		
General Information	6.0%	5.4%		
Staff Pages	2.9%	2.8%		
Other	7.2%	1.0%		
Total	100.0%	100.0%		

FTP Upload Statistics – Sac Peak (cont.)

Most of the FTP upload activity is related to the USAF Solar Mass Ejection Imager (SMEI) experiment.

There were 5,559 successful user requests, uploading 101 distinct files from 4 distinct hosts. A total of 192.476 Gbytes were uploaded, averaging 2.140 Gbytes per day.

Incoming FTP User Demographics (NSO/SP)				
Demographic Group Requests Tr				
U.S. Science (. <i>edu</i> , . <i>mil</i>)	100.0%	100.0%		
Other U.S. (.com, .net, misc.)	0.0%	0.0%		
Total	100.0%	100.0%		

Incoming FTP Uploads (NSO/SP)				
Product	Requests	Traffic		
SMEI Data	100.0%	100.0%		
Other	0.0%	0.0%		
Total	100.0%	100.0%		

NSO/Tucson (NSO/Tuc) Β.

FTP User Demographics (NSO/Tuc)				
Demographic Group No. of Users %Tota				
U.S. Science (. <i>gov, .edu, .mil</i>)	186	34.69%		
Other U.S. (. <i>com, .net, misc</i> .)	267	24.12%		
Foreign	340	28.18%		
Unresolved	107	13.01%		
Total Users	900	100%		

FTP Products (NSO/Tuc)					
Demographic Group No. of Products %Tota					
U.S. Science (<i>.gov, .edu, .mil</i>)	33,952	90.29%			
Other U.S. (. <i>com, .net, misc</i> .)	1,483	0.81%			
Foreign	35,281	4.44%			
Unresolved	805,255	4.47%			
Total Products	875,971	100%			

FTP Logins (NSO/Tuc)					
Demographic Group No. of Logins %Total					
U.S. Science (<i>.gov, .edu, .mil</i>)	80	15.55%			
Other U.S. (. <i>com, .net, misc</i> .)	33	1.80%			
Foreign	406	56.87%			
Unresolved	255	25.77%			
Total Logins	774	100%			

Gbytes of FTP & WWW Data Downloaded (NSO/Tuc)				
Demographic Group Gbytes %Tota				
U.S. Science (. <i>gov, .edu, .mil</i>)	17.46	9.6%		
Other U.S. (. <i>com, .net, misc</i> .)	2.59	0.3%		
Foreign	33.62	2.0%		
Unresolved	673.91	88.1%		
Total Gbytes	Total Gbytes 727.59			

723.28 100.0%

%Total

87.7%

0.1%

2.7%

3.9%

5.3%

0.00%

0.15%

Product Distribution by Downloaded Files (NSO/Tuc)				Product Distribution by Downloaded	Gbytes (NS	O/Tuc)
Product Type	No. of Files	%Total		Product Type	Gbytes	%To
GONG Helioseismology	778,370	88.9%		GONG Helioseismology	634.662	87.7
GONG (Magnetograms, spectra, time				GONG (Magnetograms, spectra, time		
series, frequencies)	2,839	0.3%		series, frequencies)	0.86	0.1
SOLIS/VSM	33,432	3.8%		SOLIS/VSM	19.67	2.7
KPVT (magnetograms, synoptic maps,			1	KPVT (magnetograms, synoptic maps,		
helium images)	24,714	2.8%		helium images)	28.54	3.9
FTS (Spectral atlases, general archive)	28,460	3.2%	,	FTS (Spectral atlases, general archive)	38.43	5.3
Evans/SP Spectroheliograms (Hα,				Evans/SP Spectroheliograms (Hα,		
Calcium K images)	48	0.0%		Calcium K images)	0.01	0.00
Other	8,013	0.9%		Other	1.10	0.15
Total Downloaded Files	875,876	100.0%		Total Downloaded Files	723.28	100.0

Note: All statistics are for NSO/Tucson archive usage by non-NSO and non-NOAO personnel. The numbers do not include NSO/Sunspot.

V. Public and Educational Outreach Activities

NSO public and educational outreach encompasses activities at the Sunspot Astronomy and Visitor Center, including the Visitor Center's retail operations, educational exhibits, and NSO/Sac Peak tours; tours of the NSO/Kitt Peak facilities; Web site outreach, including public information requests; scientific press and media relations; and staff involvement in programs to enhance science education in grades K–12, as well as higher education. Highlights for this quarter follow.

A. Educational Outreach

1. Research Experiences for Undergraduates (REU), Research Experiences for Teachers (RET), and Other NSO Summer Research Assistantship (SRA) Programs

During this quarter, 47 applications were accepted for NSO's 2007 REU Program and 19 applications were accepted for NSO's Summer Research Assistantship Program. Thirteen teachers applied for NSO's 2007 Research Experiences for Teachers Program. In all, a combination of 14 students and teachers will participate in summer research opportunities at locations in Tucson and Sunspot for 2007. Also included is a PhD candidate (Brian Lundberg, Utah State), who is supplementing his thesis project with a summer research assistantship at Sunspot with advisor K. S. Balasubramaniam.

Four U.S. astronomy graduate students were selected to participate in the inaugural NSO/GONG 2007 International Research Experience for (Graduate) Students (IRES) Program. Sponsored by a grant from the NSF Office of International Science and Engineering (OISE), the eight-week, summer-2007 program will take place in Bangalore, India under the auspices of the Indian Institute of Astrophysics (IIA). The goal of the program is to expose potential researchers to an international setting at an early stage in their careers. GONG Program Manager Pat Eliason and IRES Program coordinator and NSO long-term visiting scientist Kiran Jain traveled to the IIA in January to make program preparations, meeting with mentors and finalizing logistics. In June, Program Coordinator Jain will meet the students upon arrival in Delhi, take a field trip to Udaipur and Mt. Abu, then will escort them to Bangalore.

2. Project ASTRO

As a Project ASTRO partner, Kerri Donaldson-Hanna worked with four fifth-grade teachers at Ventana Vista Elementary School in Tucson, and led a number of classroom activities during the course of six separate visits to the school in February and March. These activities included lessons about the phases of the moon and on the scale of the solar system; leading demonstrations on impact cratering on Earth and other planetary bodies and on how to build a planisphere; lessons on how to use a solar telescope to observe the Sun – this included taking the students and teachers on a tour of the McMath-Pierce Solar Telescope facility and the Kitt Peak SOLIS Tower; and discussion about observing Mercury at the NASA Infrared Telescope Facility on Mauna Kea, as well as at the McMath-Pierce Telescope and with GONG.

3. Other Educational Outreach

Cliff Toner made two extensive visits to Dietz Elementary School in January and February. The first visit was as a speaker at the School's Career Day for grades K-5. Toner brought an 8-inch telescope with white-light solar filter for the students to view the Sun. He also showed the students how to log in to the NSO Web site and discussed what is done at NSO, why it's done, and why it's important. Dr. Toner's second visit was as the host of Science Night at Dietz Elementary School. He brought and 8-inch telescope for night sky viewing.

He also talked about comets and, using the "Build Your Own Comet" Active Learning Exercise developed at NOAO, he worked with the students on making their own "mini-comets" with incredients (dirt, ammonia, dry ice, syrup, etc.) he provided.

Mark Giampapa made several visits to Fruchtehendler Elementary School in Tucson in January and February, giving talks to second- through fifth-grade classes on how to do a science fair project. He also presented "Tips for a Successful Science Fair Project" to fifth graders. Dr. Giampapa spent time with a number of individual students, advising them on their respective projects for the annual 2007 science fair. Giampapa also gave talks to fifth graders on practical applications of astronomy and astronomical knowledge in the late 1800s, the time period that the class was studying as part of their visit to an old schoolhouse in Tubac, Arizona.

In February, Mark Giampapa gave a one-hour lecture to a research seminar class (ASTR 296) of 20 undergraduate students at the University of Arizona Steward Observatory.

During this quarter, Jack Harvey, John Leibacher, and Mark Giampapa met with space physics faculty at the University of Arizona (UofA) Department of Planetary Sciences, Lunar and Planetary Laboratory (LPL), to discuss the announcement of a new graduate program in solar physics at the UofA. LPL faculty members, Randy Jokipii and Joe Giacalone enthusiastically agreed to write the program announcement that would be developed into a trifold brochure and be posted at the LPL Web site. Opportunities for making an announcement of this new program started in April at the NSO Workshop 24 at Sac Peak, and will continue at the AAS/SPD meeting in Hawaii and the UofA-LPL/NSO Solar Physics School at Sac Peak in June, and at other venues, both formal and informal. Opportunities for collaborations with NSO scientific staff will be featured in the announcement. Thomas Schad, a former NSO/REU student who has been admitted to the graduate program at LPL, plans to study solar physics at the U of A beginning this fall. Schad has indicated that his choice of the UofA/LPL over other graduate school opportunities is a result of his attendance at the 2006 UofA/NSO Summer School and participation in the 2006 NSO REU program.

At the request of Erich Landstrom, Science Department Chair of Boynton Beach Community High School in Florida, NSO provided 25 copies of the NSO designed RASL/DASL (Research in Active Solar Longitudes/Data and Activities with Solar Learning) CD-ROMs and workbooks for Landstrom's workshop for high school teachers on 17 March on "Solar Max! Plotting the Sunspot Cycle Using Graphic Calculators."

B. Public Outreach

1. Sunspot Visitor Center

Sunspot Astronomy & Visitor Center Summary of Visitors and Tours (3 Months Ending 03/31/07)					
Group/Program	No. of Visitors				
General Public Tours (Visits to Center and Self-Guided Tours)	1,367				
Guided Public Tours:					
- School Groups K-12	- School Groups K-12 77				
- Special Tours	15				
Total Visitors	1,459				

2. Other Public Outreach, Including External Coordination, Media and Public Information

During this quarter, NSO completed the development of a temporary exhibit on the Sun that is being shown at the National Atomic Museum in Albuquerque, March-September 2007. The exhibit includes five display panels that take the visitor from the core of the Sun to the edge of the solar system, and explains the importance of studying the Sun.

On January 25, Mark Giampapa gave a presentation on "The Sun—Our Star" to an audience of 260 people at the Chico Area Recreation District Building in Chico, California. This was the first of a thirteen-week series of guest lectures sponsored by the Northern California Natural History Museum, the Kiwanis Chico Community Observatory, and California State University-Chico.

On March 22, Dave Dooling spoke to the Roswell Amateur Astronomy Club about the Sunspot Solar System Model and the Advanced Technology Solar Telescope. Dooling also provided support to NOAO for the March 22-31 international GLOBE at Night program by securing observers for the event in Southern New Mexico and on Maui, Hawaii.

Summer 2006 REU student Rachel MacDonald (University of Washington (UW), Seattle) presented the results of her REU project, "Changes in Sunspot Umbral Intensity over Time," as a poster at the American Astronomical Society Meeting in Seattle in January. NSO advisor Matt Penn continued to mentor Rachel as her advisor for a UW-Seattle independent study course through the end of this quarter.

NSO did not issue any press releases during this quarter.

V. Risk Management and Safety Report

Risk Management services at NSO/Kitt Peak and Tucson are shared with NOAO. See also the "Tucson and Kitt Peak Site Safety Report" section (pages 6-9) of the NOAO January - March 2007 Quarterly Report for additional details on risk management activities.

A. OSHA Recordable Occupational Injuries, Illnesses, and Other Incidents

• During this quarter, there were two non-recordable accidents at Sac Peak. First, a hydraulic hose burst on the snowplow, impacting an employee's wrist and finger. No follow up or restricted activity was required. Second, while moving a ladder down stairs at the Dunn Solar Telescope, an employee tripped and landed on his back. He was examined by a doctor and follow-up was required. No lost time or restricted activity was required.

B. Safety and Health

• As required, the OSHA 300A log was completed and posted at the NSO/SP administration office before February 1. For calendar year 2006, Sac Peak had one recordable accident with 20 days of restricted activity. We also had three other non-recordable incidents.

C. Fire Protection and Prevention

• The Sunspot volunteer fire department, in conjunction with NSO and Apache Point Observatory (APO) are initiating a high-angle rescue team to assist in rescue efforts at the Dunn Solar Telescope and APO, as well as other locations if called upon. Wayne Jones is leading that effort. New equipment has been purchased and training has begun.

APPENDIX National Solar Observatory 01 January - 31 March 2007

January - March 2007: During this period, 17 observing programs, four of which were thesis programs, were carried out at NSO. Graduate and undergraduate students are indicated by (T) for thesis students, (G) for non-thesis graduate students, (UT) for undergraduate thesis students, and (U) for undergraduate students. (TLRBSE) identifies middle and high school teachers who are Teacher Leaders in Research Based Science Education program participants, (REU) identifies Research Experiences for Undergraduates program participants, and (RET) identifies Research Experience for Teachers participants.

		Nights	Days	Hours
1858		0.0	14.0	151.0
William Livingston	National Solar Observatory			
Cycle Variability of the S	Solar Spectrum			
McMP Main spectrogram	ph			
2030c		11.0	0.0	263.0
Ronald Oliversen	NASA/Goddard Space Flight Center			
Harris	University of Washington, Seattle			
Morgenthaler	University of Washington, Seattle			
Mierkiewicz	University of Wisconsin-Madison			
Lupie	NASA Goddard Space Flight Center			
Io As a Probe of the Plas	sma Torus			
McMP Stellar spectrogr	aph			
2030c		10.0	0.0	263.0
Ronald Oliversen	NASA/Goddard Space Flight Center			
Dawson (G)	University of Washington			
Roesler	University of Wisconsin			
Mierkiewicz	University of Wisconsin-Madison			
Lupie	NASA Goddard Space Flight Center			
Io As a Probe of the Plas	sma Torus			
McMP Stellar spectrogr	aph			
2058		0.0	8.0	72.0
Andrew Potter	National Solar Observatory			
Killen	University of Maryland			
Knight (T)	University of Maryland			
Studies of Exospheric En	nission Lines in the Inner Solar System			
McMP Stellar spectrogr	aph			
2058n		8.0	0.0	86.0
Andrew Potter	National Solar Observatory			
Killen	University of Maryland			
Knight (T)	University of Maryland			
Studies of Exospheric En	nission Lines in the Inner Solar System			

McMP Stellar spectrograph

		Nights	Days	Hours
2127		0.0	14.4	56.0
2127 Richard Altrock	USAF Research Laboratory	0.0	14.4	56.0
Three Line Coronal Photomet				
	er			
Evans Facility Sac Peak				
2128		0.0	14.6	58.0
Simon Worden	NASA Ames Research Center			
Keil	National Solar Observatory			
Ca K Solar Rotation				
Evans Facility Sac Peak				
2489		0.0	25.5	202.0
Douglas Gilliam	National Solar Observatory	0.0	2010	202.0
Bradford	National Solar Observatory			
Elrod	National Solar Observatory			
Dunn Solar Telescope Mainter	nance			
Dunn Solar Telescope/SP Sac	Peak			
2498		0.0	5.0	3.0
Aimee Norton	National Solar Observatory			
MHD Wave Speeds As a Func	tion of Umbral Field Strengths			
McMP Main spectrograph				
2506		0.0	20.0	214.0
Donald Jennings	NASA/Goddard Space Flight Center			
Sada	Universidad de Monterrey			
McCabe	CMA Consulting			
Miko	NASA/Goddard Space Flight Center			
Observation of a Pluto Occulto	ttion with the McMath-Pierce			
McMP Main spectrograph				
2506n		10.0	0.0	144.0
Donald Jennings	NASA/Goddard Space Flight Center			
Sada	Universidad de Monterrey			
McCabe	CMA Consulting			
Miko	NASA/Goddard Space Flight Center			
Observation of a Pluto Occulto	ntion with the McMath-Pierce			

McMP Main spectrograph

		Nights	Days	Hours
2514		0.0	11.0	29 A
2514	ETH 7: minh	0.0	11.8	38.0
Lucia Kienit (1)	ETH-Zuffen			
Ultenbroek	National Solar Observatory			
Tritschier	National Solar Observatory			
Reardon	INAF - Arcetri Astrophysical Observatory	~		
Spectropolarimetry of the C	hromosphere with the Interferometric Bidimensional S	Spectrometer (IBI	S)	
Dunn Solar Telescope/SP S	Sac Peak			
2515		0.0	20.0	91.0
Haosheng Lin	University of Hawaii, IFA			
Facility Infrared Spectropo	olarimeter (FIRS) Engineering			
Dunn Solar Telescope/SP S	Sac Peak			
2516		0.0	9.0	48.0
Mihalis Mathioudakis	Queen's University, Belfast			
Andic	Queen's University, Belfast			
Jess (T)	Queen's University, Belfast			
Reardon	INAF - Arcetri Astrophysical Observatory			
High-Frequency Oscillation	is in the Solar Atmosphere: Oscillatory Power in Veloc	city & Intensity		
Dunn Solar Telescope/SP	Sac Peak			
2517		0.0	11.0	40.0
2017	Institute de Astrofision de Andelusie (CRIC)	0.0	11.0	49.0
Tritaghlan	National Salar Observatory			
Litanhroek	National Solar Observatory			
del Toro Inieste	Institute de Astrofísice de Andelucie (CSIC)			
Origin and Evolution of Ma	wing Magnetic Features in and around Sunspots			
Dunn Solar Telescope/SP S	Sac Peak			
2518		0.0	11.0	44.0
Gianna Cauzzi	Osservatorio Astrofisico di Arcetri			
Tritschler	National Solar Observatory			
Uitenbroek	National Solar Observatory			
Dynamics of Quiet Sun Fib	rils			
Dunn Solar Telescope/SP	Sac Peak			

		Nights	Days	Hours
2519		0.0	1.0	10.0
Jose Marino (T)	New Jersey Institute of Technology			
Rimmele	National Solar Observatory			
Richards	National Solar Observatory			
Point Spread Function	(PSF) Observations and High-Order Adaptive Optics	Testing		

Dunn Solar Telescope/SP Sac Peak