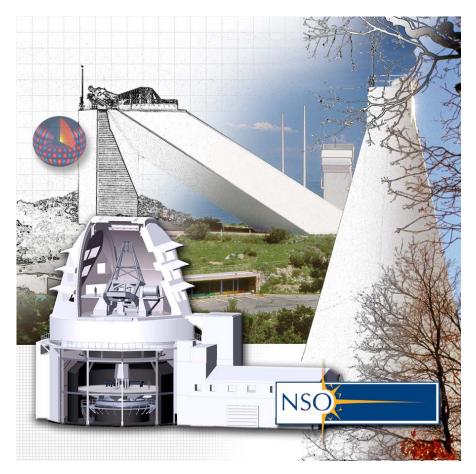
NATIONAL SOLAR OBSERVATORY



NSO Quarterly Report (2) FY 2006 January 1, 2006 – March 31, 2006

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, 2006. 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*

21 observing programs, two of which were thesis programs involving five graduate students, 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 Mar2006	Nbr	% Total			
Programs (US)	18	86%			
Programs (non-US)	1	5%			
Thesis (US)	0	0%			
Thesis (non-US)	2	10%			
Total Number of Unique Science Projects*	· 21	100%			

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

Users of NSO Facilities by Category						
		Vis	NSO/NOAO Staff			
	US	Non-US	% Total			
PhDs	21	8	29	83%	7	
Graduate Students	0	5	5	14%	0	
Undergraduate Students	0	0	0	0%	0	
Other	0	1	1	3%	6	
Total Users	21 14 35 100% 13					

Institutions Represented by Visiting Users**						
US Non-US Total % Total						
Academic	4	4	8	57%		
Non-Academic	4	2	6	43%		
Total Academic & Non-Academic 8 6 14 100%						

**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).

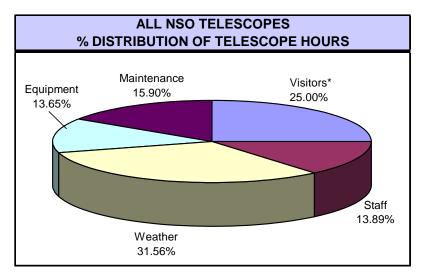
INSTITUTIONS REPRESENTED BY USERS
Foreign Institutions (4)
Armagh Observatory
INAF - Arcetri Astrophysical Observatory, Italy
Queens University, Ireland
Royal Observatory of Belgium
US Institutions (8)
Dickinson College, PA
EdinboroUniversity, PA
New Mexico State University
University of Arizona
High Altitude Observatory, NCAR, Boulder
NASA Ames Research Center
NASA/Goddard Space Flight Center
Southwest Research Institute, Boulder
US Air Force/Philips Lab (USAF/PL/GSS)

Number of Users by Nationality						
Belgium	1	Mexico	1			
Ireland	6	United States	34			
Italy	Italy 6					

II. Telescope Usage and Performance Data

In the quarter ending March 31, 2006, 25.0% 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; 13.9% were devoted to the programs of NSO and NOAO scientists. Scheduled maintenance, including instrument tests, engineering, and equipment changes, accounted for 15.9% of total allotted telescope hours.

Total "downtime" (hours lost to weather and equipment problems) for NSO telescopes was 45.2%. 31.6% of these lost observing hours were due to bad weather, with 13.7% 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, 2006 - March 31, 2006						
% Hours Used By: % Hours Lost To: % Hrs. Lost T						
Telescope	Hours Available	Visitors ^a	Staff	Weather	Equipment	Scheduled Maintenance
Dunn Solar Telescope/SP	774.0	39.1%	0.8%	36.2%	0.6%	23.3%
McMath-Pierce**	715.0	16.4%	39.7%	34.0%	9.9%	0.0%
KP SOLIS Tower ^b	0.0	0.0%	0.0%	0.0%	0.0%	0.0%
FTS Lab**	361.0	0.0%	0.0%	0.0%	0.0%	0.0%
Evans Facility	238.0	42.9%	0.0%	57.1%	0.0%	0.0%
Hilltop Dome	0.0	0.0%	0.0%	0.0%	0.0%	0.0%
All Telescopes 2,088.0 25.0% 13.9% 31.6% 13.6% 15.9%						

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

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

^{**}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 Service User Demographics (NSO/SP)				
Demographic Group	Traffic			
U.S. Science (.gov, .edu, .mil)	8.4%	7.8%		
Other U.S. (.com, .net, misc.)	74.6%	60.4%		
Foreign	16.1%	31.4%		
Unresolved	0.9%	0.4%		

FTP Archive Statistics

There were 203,509 successful user requests, serving 5,475 distinct files to 6,044 distinct hosts. A total of 75.657 Gbytes were served, averaging 861.185 Mbytes per day.

FTP User Demographics (NSO/SP)					
Demographic Group	Requests	Traffic			
U.S. Science (.gov, .edu, .mil)	10.6%	9.2%			
Other U.S. (.com, .net, misc.)	75.4%	50.2%			
Foreign	13.5%	40.5%			
Unresolved	0.5%	0.2%			

FTP Products (NSO/SP)				
Product	Requests	Traffic		
Realtime Images	2.7%	1.6%		
Corona Maps	96.2%	50.3%		
Staff Outgoing	0.4%	48.0%		
Other	0.7%	0.1%		

World Wide Web Statistics

There were 1,768,281 successful user requests, serving 44,983 distinct files to 89,340 distinct hosts. A total of 64.282 Gbytes were served, averaging 731.397 Mbytes per day.

WWW User Demographics (NSO/SP)					
Demographic Group	Requests	Traffic			
U.S. Science (.gov, .edu, .mil)	8.1%	6.2%			
Other U.S. (.com, .net, misc.)	74.5%	72.4%			
Foreign	16.4%	20.6%			
Unresolved	0.9%	0.7%			

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 & Movies (ISOON, Other)	14.2%	28.9%			
Other Images	2.7%	7.6%			
General Icon and Background Images	22.1%	3.6%			
Public Relations Pages	11.7%	2.4%			
Press Releases	2.3%	10.3%			
Telescope Home Pages	7.1%	2.4%			
ISOON Project Images	4.5%	1.9%			
SMEI Experiment & Data Pages	13.7%	9.7%			
Adaptive Optics Pages	0.6%	1.1%			
General Information	11.4%	19.0%			
Staff Pages	3.6%	9.2%			
Other	6.1%	3.9%			

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FTP Upload Statistics – Sac Peak (cont.)

FTP uploads are using a significant amount of available bandwidth. Most of the FTP upload activity is related to the USAF Solar Mass Ejection Imager (SMEI) experiment.

There were 5,307successful user requests uploading 131 distinct files from 12 distinct hosts. A total of 181.606 Gbytes were uploaded, averaging 2.019 Gbytes per day.

Incoming FTP User Demographics (NSO/SP)			
Demographic Group	Requests	Traffic	
U.S. Science (.edu, .mil)	99.8%	100.0%	
Other U.S. (.com, .net, misc.)	0.1%	0.0%	
Foreign	0.1%	0.0%	

Incoming FTP Uploads (NSO/SP)			
Product	Requests	Traffic	
SMEI Data	99.4%	100.0%	
Workshop Talks	0.6%	0.0%	
Other Uploads	0.0%	0.0%	

B. NSO/Tucson

FTP User Demographics (NSO/Tuc)			
Demographic Group	No. of Users	%Total	
U.S. Science (.gov, .edu, .mil)	183	28.64%	
U.S. Public (.com, .net, misc.)	162	25.35%	
Foreign	204	31.92%	
Unresolved	90	14.08%	
Total Users	639	100%	

FTP Logins (NSO/Tuc)			
Demographic Group	No. of Logins	%Total	
U.S. Science (.gov, .edu, .mil)	13,591	17.88%	
U.S. Public (.com, .net, misc.)	22,450	29.53%	
Foreign	38,968	51.25%	
Unresolved	1,020	1.34%	
Total Logins	76,029	100%	

FTP Products (NSO/Tuc)			
Demographic Group	No. of Products	%Total	
U.S. Science (.gov, .edu, .mil)	668,083	87.05%	
U.S. Public (.com, .net, misc.)	2,440	0.32%	
Foreign	74,315	9.68%	
Unresolved	22,648	2.95%	
Total Products	767,486	100%	

Gbytes of FTP & WWW Data Downloaded (NSO/Tuc)		
Demographic Group	Gbytes	%Total
U.S. Science (.gov, .edu, .mil)	500.15	82.0%
U.S. Public (.com, .net, misc.)	1.02	0.2%
Foreign	85.60	14.0%
Unresolved	23.21	3.8%
Total Gbytes	609.98	100%

Product Distribution by Downloaded Files (NSO/Tuc)		
Product Type	No. of Files	%Total
GONG (Magnetograms, spectra, time		
series, frequencies)	677,562	88.3%
SOLIS/VSM	12,615	1.6%
KPVT (magnetograms, synoptic maps,		
helium images)	6,218	0.8%
FTS (Spectral atlases, general archive)	62,660	8.2%
Evans/SP Spectroheliograms (Ha, Calcium		
K images)	39	0.01%
Other	7,983	1.04%
Total Downloaded Files	767,077	100.0%

Product Distribution by Downloaded Gbytes (NSO/Tuc)			
Product Type	Gbytes	%Total	
GONG (Magnetograms, spectra, time series,			
frequencies)	501.42	83.9%	
SOLIS/VSM	7.00	1.2%	
KPVT (magnetograms, synoptic maps, helium			
images)	2.97	0.5%	
FTS (Spectral atlases, general archive)	85.63	14.3%	
Evans/SP Spectroheliograms (Hα, Calcium K			
images)	0.27	0.05%	
Total Downloaded Files	597.28	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) and Research Experiences for Teachers (RET)Programs

During this quarter, 54 applicants were accepted for NSO's 2006 Research Experiences for Undergraduates Program and 9 applications were accepted for NSO's graduate Summer Research Assistantship Program. 24 teachers applied for NSO's 2006 Research Experiences for Teachers Program. In all, a combination of approximately 16 students and teachers will participate in summer research opportunities at locations in Tucson and Sunspot for 2006. Also included are PhD and Masters candidates supplementing their individual thesis projects. The NSO REU/RET programs were also advertised in the fall winter issues of *Winds of Change*, the membership magazine of the American Indian Science and Engineering Society.

2. Project ASTRO

As a Project ASTRO partner, Kerri Donaldson-Hanna coordinated a number of activities for three classes of fifth graders at Ventana Vista Elementary School in Tucson during February and March. These activities included leading demonstrations on impact cratering, on phases of the moon, and on the scale of the solar system; building planispheres and teaching the students how to use them; demonstrating the mass of planets in the solar system at a star party; and organizing and leading tours to the University of Arizona Steward Mirror Lab and the Lunar and Planetary Laboratory's HiRISE facilities. Frank Hill gave a talk on helioseismology to the Ventana Vista fifth graders in March. During this quarter, Dave Dooling contacted the New Mexico Museum of Space History about adding a solar component to the September 2006 Project ASTRO activity.

3. Other Educational Outreach

In January, Mark Giampapa gave presentations to second, fourth and fifth grade classes at Fruchthendler Elementary School in Tucson on how to do a science fair project for the school's annual science fair in February and the regional (Southern Arizona Regional Science and Engineering Fair (SARSEF)) competition that followed in March. Giampapa and Roberta Toussaint served as judges for the Fruchthendler science fair competition, and Toussaint was a SARSEF judge at the regional competition. Roberta Toussaint also visited Sabino High School and gave a talk and demonstrations with two solar telescopes in March.

Postdoc Bill Sherry participated in the January 4-8 Winter School of the University of Arizona's Life and Planets Astrobiology Center (LAPLACE).

Dave Dooling initiated discussions with Prof. Paul Hardersen of the University of North Dakota (UND) Department of Space Studies about supporting UND in an advanced observational astronomy course to be offered in the fall. The course would include solar observing.

In addition to co-hosting a tour group (with Kris Koenig of Chico Observatory) to the March 29th total eclipse in Egypt, Claude Plymate participated in a live, Web-cast panel discussion about the eclipse as part of Koenig's educational video on "Celebrating Science." After watching a short film clip on the eclipse, students from numerous grade schools across the US were invited to post questions relating to the eclipse, and the questions were answered in real-time.

B. Public Outreach

1. Sunspot Visitor Center

Sunspot Astronomy & Visitor Center Summary of Visitors and Tours (3 Months Ending 03/31/06)			
Group/Program	No. of Visitors		
General Public Tours (Visits to Center and Self-Guided Tours)	1,515		
Guided Public Tours:			
- School Groups K-12	80		
- Special Tours	63		
Total Visitors 1,658			

2. Other Public Outreach, Including Media and Public Information

Dave Dooling held a working group meeting in Sunspot with representatives of the New Mexico Scenic Byways and New Mexico Department of Transportation, NSO staff, and museums in Alamogordo and Las Cruces on a planned solar system scale model (1:250 million) that will include an 18-foot-diameter walkthrough model of the Sun built from a large radome. The plan is to build the model in four phases over the next three years, including: new displays at the Sunspot Visitor Center, highway signs for the model, radome for the Sun, and additional markers at scenic stops and hiking trails. Dooling also briefed the Cloudcroft Chamber of Commerce director and representatives at New Mexico State University on the model, and met with NOAO Manager of Science Education Steve Pompea and NSO staff in Tucson to discuss public knowledge of the Sun.

A series of economic and cultural impact meetings were held this quarter as part of the outreach effort related to building the Advanced Technology Solar Telescope (ATST) on Haleakalā in Maui, Hawai'i. In January, Jeff Barr, Rex Hunter, and Jeremy Wagner met with Native Hawaiian representatives regarding National Historic Preservation Act (NHPA) Section 106 for ATST, and with the public at the Maui Community Center regarding ATST. In March, Hunter, Wagner, and Jennifer Ditsler participated in another Maui public meeting and NHPA Section 106 meeting, as well as meetings with Maui Community College Chancellor Clyde Sakamoto, with Office of Hawaiian Affairs Maui Representative Judge Boyd Mossman, with the Maui Economic Development Board, and with NOAA Marine Whale Sanctuary personnel.

In January, John Leibacher participated in a 1.5-hour-long press conference at the CNRS headquarters in Paris as part of the European International Heliophysical Year conference. Leibacher also had a radio interview on Weekend America, produced by American Public Media and broadcast on National Public Radio stations throughout the US. Dave Dooling did an interview on solar storms with a college paper in Indiana.

Two press releases were issued this quarter – one on planned observations of Venus by a New Mexico State University scientist using the Dunn Solar Telescope (February 6, 2006: "Peeking behind the Veil of Venus" <u>http://www.nso.edu/press/venus06/</u>), and another about the University of Arizona/National Solar Observatory summer school in June (February 23, 2006: "Summer School in Solar Physics" <u>http://www.nso.edu/press/summer_school06.html</u>).

NSO provided a high-resolution Sunspot image that was used in President George W. Bush's FY 2007 Budget message (<u>http://www.whitehouse.gov/omb/budget/fy2007/nsf.html</u>) and on the back page of the February issue of *Discover* magazine (<u>http://www.discover.com/issues/feb-06/departments/x/</u>).

Burt Villegas and Tim Purdy participated in an outreach activity that involved viewing the March 2006 eclipse at the GONG site in El Teide, Instituto Astrofisica de Canarias (IAC), Spain (<u>http://www.iac.es/telescopes/Novedades/Eclipse%20Marzo%202006/Eclipse-March-2006.htm</u>).

Ramona Elrod and Lou Ann Gregory represented NSO at the February 8 meeting of the Southwestern Consortium of Observatories for Public Education (SCOPE).

The fourth (Winter 2006) issue of the ATST Quarterly Newsletter was published in March.

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 of the NOAO January - March 2006 Quarterly Report for additional details on risk management activities.

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

• The annually required OSHA 300A log for NSO/Sac Peak was completed and posted in Sunspot before February 1. For calendar year 2005, NSO/Sunspot logged no OSHA recordable injuries. The OSHA 300A log for Tucson and Kitt Peak was also posted. For calendar year 2005, Tucson enjoyed a year with no OSHA recordable injuries. Kitt Peak experienced two OSHA recordable injuries, ending the year with an incident rate of 4.3 (four injuries per 100 employees).

B. Safety and Health

• The new NOAO/NSO Risk Management Manual has been added to the NOAO "safety" – risk management documents, intra-net Web site. This document replaces the 1991 version of the NOAO Safety Handbook, or the old yellow book. Recently added the site is an editorial "Not Polite to Point" by Paul Winston in the Fun and Interesting Stuff section, NSO Hazardous Materials Transportation Policy, a new safety tip every week provided by the National Safety Council and the Kitt Peak Emergency Manual was updated.

- The NSO ATST "Contractor Safety and Health Specifications," "Conditions for Working at the Site," and "Contractor Pre-Bid Qualifications Form" drafts were submitted to the ATST project team on January 4. Chuck Gessner presented and participated in the January 17, 18, 19, ATST Systems Design Review meeting and provided review comments to the project team after the meeting.
- Revising the NOAO/NSO Business Contingency Plan is work in progress. Mia Hartman is progressing with the emergency contact lists. Other items were added to the master CD including pdf maps of the Tucson facility, Influenza Crisis Plan, "National Academies Fact Sheets," and insurance frequently asked questions.
- Clark Enterline, Chuck Gessner, and Sean Williams (NSO/SP) attended the DOT/Hazardous Materials Transportation Refresher to comply the Department of Transportation 49 CFR Regulations on January 31.
- Risk Management comments were provided to Steve Grandi related to the pre-release draft document: "Guidelines for IT Security of NSF's Large Facilities."
- Valorie Burkholder, Clark Enterline, Chuck Gessner, and Mike Dulick met on February 15 and finalized the draft of the "NSO Hazardous Materials Transportation Policy." This policy was developed specifically for the Fourier Transform Spectrometer (FTS) Laboratory on Kitt Peak. The policy will be submitted to potential observers to clarify our requirements for transporting and using hazardous materials at our facilities.
- Guillermo Montijo and Chuck Gessner worked on finalizing first aid kit upgrades and restocking for the GONG structures. The new kits will be portable in the event technicians need to provide care while seeking advanced medical attention.

C. Environmental

• NSO submitted an application for re-permitting the Sunspot sewer plant with the State of New Mexico Environmental Department. Negotiations, remediation and modifications to the plant and effluent distribution will continue through the next several months.

APPENDIX National Solar Observatory 01 January - 31 March 2006

January - March 2006: During this period, 21 observing programs, two of which were thesis programs involving five graduate students, were carried out at the National Solar Observatory. 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, and (RET) identifies Research Experience for Teachers program participants.

	-	Nights	Days	Hours
8		0.0	15.2	152.0
Michael Dulick	National Solar Observatory			
FTS Beamsplitter Chang	es; System Maintenance			
McMP FTS Lab				
1858		0.0	10.0	156.0
William Livingston	National Solar Observatory			
Cycle Variability of the S	olar Spectrum			
McMP Main spectrograp	bh			
2127		0.0	13.4	54.0
Richard Altrock	USAF Research Laboratory			
Three-Line Coronal Phot	tometer			
Evans Facility Sac Peak				
2128		0.0	14.6	48.0
Simon Worden	NASA Ames Research Center			
Keil	National Solar Observatory			
Ca K Solar Rotation				
Evans Facility Sac Peak				
2282		0.0	12.0	76.0
Donald Jennings	NASA/Goddard Space Flight Center			
McCabe	NASA Goddard Space Flight Center			
Sada	Universidad de Monterrey			
Boyle	Dickinson College			
Moran	NASA/Goddard Space Flight Center			
Zeeman Splitting in OH	at 12 Microns			
McMP Main spectrogram	bh			

		Nights	Days	Hours
2282n		12.0	0.0	32.0
Donald Jennings	NASA/Goddard Space Flight Center			
Hesman	NASA/Goddard Space Flight Center			
Zeeman Splitting in OH	at 12 Microns			
McMP Main spectrogra				
2375		0.0	2.0	7.0
Constance Walker	National Optical Astronomy Observatory			
Walker	University of Arizona, Steward Observatory			
Understanding the Morp Sunspots	phology of Active Regions: Using Zeeman-Split IR Line.	s to Determine Mag	netic Field Str	engths of
McMP Main spectrogra	ph			
2385		0.0	8.0	22.0
Dario Del Moro	University of Rome "Tor Vergata"			
Berrilli	University of Rome "Tor Vergata"			
Criscuoli (T)	University of Rome "Tor Vergata"			
Giordano (T)	University of Rome "Tor Vergata"			
Convective Velocity Fiel	ds at the Basis of the Photosphere with the Interferome	tric BIdimensional S	Spectrometer (IBIS)
-				
Dunn Solar Telescope/SF	' Sac Peak			
Dunn Solar Telescope/SF	Sac Peak	0.0	2.0	9.0
Dunn Solar Telescope/SF 2439	P Sac Peak Edinboro University of Pennsylvania	0.0	2.0	9.0
Dunn Solar Telescope/SF 2439 James LoPresto		0.0	2.0	9.0
-	Edinboro University of Pennsylvania	0.0	2.0	9.0
Dunn Solar Telescope/SF 2439 James LoPresto Plymate	Edinboro University of Pennsylvania	0.0	2.0	9.0
Dunn Solar Telescope/SF 2439 James LoPresto Plymate Polar Solar Vortex	Edinboro University of Pennsylvania	0.0	2.0	9.0
Dunn Solar Telescope/SF 2439 James LoPresto Plymate Polar Solar Vortex McMP FTS/Mc-P	Edinboro University of Pennsylvania			
Dunn Solar Telescope/SF 2439 James LoPresto Plymate Polar Solar Vortex McMP FTS/Mc-P 2456 Mark Giampapa	Edinboro University of Pennsylvania National Solar Observatory			
Dunn Solar Telescope/SF 2439 James LoPresto Plymate Polar Solar Vortex McMP FTS/Mc-P 2456	Edinboro University of Pennsylvania National Solar Observatory National Solar Observatory			

McMP Stellar spectrograph

		Nights	Days	Hours
2457		0.0	5.0	14.0
Sumner Davis	National Solar Observatory	0.0	5.0	14.0
Livingston	National Solar Observatory			
Wallace	National Optical Astronomy Observatory			
The Infrared Spectrum	of the Sun in Integrated Light			
McMP FTS/Mc-P				
2478		0.0	15.5	124.0
Steve Hegwer	National Solar Observatory			
Gilliam	National Solar Observatory			
	National Solar Observatory			
DST Port 4 AO Optical	Upgrade			
Dunn Solar Telescope/S	P Sac Peak			
2479		0.0	4.5	25.5
John Doyle	Armagh Observatory			
Mathioudakis	Queen's University, Belfast			
Madjarska	Royal Observatory of Belgium			
Perez-Suarez (T)	Armagh Observatory			
Bloomfield (T)	Queen's University, Belfast			
Solar Transient Events	and Their Importance for Coronal Heating			
Dunn Solar Telescope/S	P Sac Peak			
2479		0.0	4.5	25.5
John Doyle	Armagh Observatory			
Keenan	Queen's University, Belfast			
Jess (T)	Queen's University, Belfast			
Solar Transient Events	and Their Importance for Coronal Heating			
Dunn Solar Telescope/S	P Sac Peak			
2480		0.0	6.0	48.0
Chris Berst	National Solar Observatory			
Integrated Circuit Card	(ICC) Maintenance			
Dunn Solar Telescope/S	P Sac Peak			

		Nights	Days	Hours
2481		0.0	11.0	40.0
Bruce Lites	High Altitude Observatory, UCAR			
Socas-Navarro	High Altitude Observatory, UCAR			
Quiet Sun Magnetic Fi	elds at High Angular Resolution (DLSP)			
Dunn Solar Telescope/S	P Sac Peak			
2482		0.0	3.0	24.0
Nancy Chanover	New Mexico State University			
Young	Southwest Research Institute			
Weather in the Lower A	tmosphere of Venus			
Dunn Solar Telescope/S	P Sac Peak			
2484		0.0	11.1	81.0
Kevin Reardon	INAF - Arcetri Astrophysical Observatory			
Casini	High Altitude Observatory, NCAR			
Cavallini	INAF - Arcetri Astrophysical Observatory			
Tomczyk	High Altitude Observatory, NCAR			
Spectro-polarimetry of	the Choromosphere and Photosphere with the Interferom	netric Bidimensiona	l Spectromete	r (IBIS)
Dunn Solar Telescope/S	P Sac Peak			
2485		0.0	5.5	21.0
Juan Borrero	High Altitude Observatory, UCAR	0.0	5.5	21.0
Tomczyk	High Altitude Observatory, NCAR			
Reardon	INAF - Arcetri Astrophysical Observatory			
Socas-Navarro	High Altitude Observatory, UCAR			
Elmore	High Altitude Observatory, NCAR			
Penumbral Structure				
Dunn Solar Telescope/S	P Sac Peak			
2486		0.0	14.5	55.0
Phillip Judge	High Altitude Observatory, NCAR			
Pietarila	High Altitude Observatory, NCAR			
Elmore	High Altitude Observatory, NCAR			
Structure of the Chrom	ospheric and Transition Region Network			
Dunn Solar Telescope/S				
2487		0.0	0.5	5.0
Scott Gregory	National Solar Observatory	0.0	0.5	5.0
Long	National Solar Observatory			
Elevator Door & Turre				

Dunn Solar Telescope/SP Sac Peak

		Nights	Days	Hours
2488		0.0	4.9	18.0
David Elmore	High Altitude Observatory, NCAR			
Socas-Navarro	High Altitude Observatory, UCAR			

Spectro-Polarimeter for Infrared and Optical Regions (SPINOR) Engineering

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