NATIONAL SOLAR OBSERVATORY



Quarterly Report (3) FY 2008 01 April - 30 June 2008

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 30 June 2008. 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 observing programs at NSO facilities this quarter.

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*

34 observing programs, six of which were thesis programs involving seven thesis graduate students, and three involving three non-thesis graduate students, were carried out at NSO this quarter. A comprehensive list of Pl's, Co-l's, and collaborators, as well as program titles, telescopes used, and observing hours associated with observing programs this quarter is attached as the Appendix.

NSO Observing Programs by Type (US and Foreign)				
3 Months Ending June 2008	Nbr	% Total		
Programs (US, involving 3 non-thesis grad students & 1 undergrad)	24	71%		
Programs (non-US)	4	12%		
Thesis (US, involving 3 grad students)	5	15%		
Thesis (non-US, involving 4 grad students)	1	3%		
Total Number of Unique Science Projects*	34	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	27	10	37	74%	11
Graduate Students	6	4	10	20%	0
Undergraduate S tudents	1	0	1	2%	0
Other	2	0	2	4%	8
Total Users	36	14	50	100%	19

Institutions Represented by Visiting Users**						
	US	Non-US	Total	% Total		
Academic	13	5	18	62%		
Non-Academic	8	3	11	38%		
Total Academic & Non-Academic 21 8 29 100%						

^{**}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).

Number of Users by Nationality					
Germany	4	Mexico	1		
Italy	2	Netherlands	5		
Japan	2	United States	55		

Institutions Represented by Users
Foreign Institutions (8)
Astrophysikalisches Institut Potsdam
Delft University of Technology
INAF - Arcetri Astrophysical Observatory
Kiepenheuer Inst fuer Sonnenphysik
National Astronomical Observatory of Japan
TNO Institute of Applied Physics, Delft
Universidad de Monterrey
Utrecht University
US Institutions (21)

Adler Planetarium, Chicago
Boston University
California State University, Northridge
Dickinson College
Edinboro University

Harvard-Smithsonian Center for Astrophysics High Altitude Observatory, NCAR, Boulder

Jet Propulsion Lab, Pasadena, CA

Lockheed Martin Solar & Astrophysics Lab Mount Holyoke College

Mt. Wilson Observatory

NASA/Ames Research Center

NASA/Goddard Space Flight Center (NASA/GSFC)

Southwest Research Institute, San Antonio

University of Arizona

University of Colorado

University of Florida

University of Hawaii, IFA

University of Maryland

University of Washington

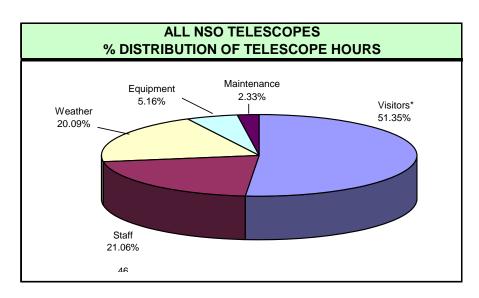
University of Wisconsin, Madison

US Air Force/Philips Lab (USAF/PL/GSS)

II. Telescope Usage and Performance Data

In the quarter that ended 30 June 2008, 51.4% of the total available telescope hours at NSO/Sacramento Peak and NSO/Kitt Peak went to the observing programs of visiting principal investigators and synoptic programs; 21.1% were devoted to the programs of NSO and NOAO scientists. Scheduled maintenance, including instrument tests, engineering, and equipment changes accounted for 7.5% of total allotted telescope hours.

Total "downtime" (hours lost to weather and equipment problems) for NSO telescopes was 25.3%. 20.1% of these lost observing hours were due to bad weather, with 5.2% lost to equipment problems.



NSO TELESCOPES Percent Distribution of Telescope Hours (Scheduled vs. Downtime) 01 April 2008 - 30 June 2008							
	% Hours Used By: % Hours Lost To: % Hrs. Lost To:						
Telescope	Hours Scheduled	Visitors ^a	Staff	Weather	Equipment	Scheduled Maintenance	
Dunn Solar Telescope/SP	1,032.0	28.9%	25.2%	35.8%	2.3%	7.8%	
McMath-Pierce*	1,333.0	52.9%	34.7%	8.8%	3.7%	0.0%	
KP SOLIS Tower ^{a,b}	694.0	80.7%	0.0%	13.5%	5.8%	0.0%	
FTS Lab*	32.0	100.0%	0.0%	0.0%	0.0%	0.0%	
Evans Facility	338.0	49.1%	0.0%	32.0%	18.9%	0.0%	
Hilltop Dome							
All Telescopes 3,429.0 51.4% 21.1% 20.1% 5.2% 2.3%							

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

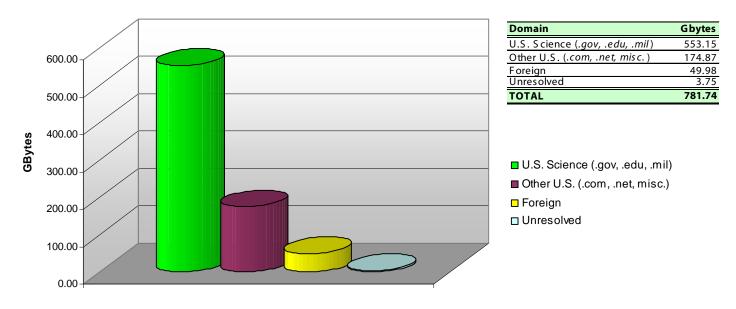
^b Formerly the Kitt Peak Vacuum Telescope (KPVT).

Totals include both day and night hours. (All others are day only.)

III. User Statistics – Archives/Data Bases

All statistics *exclude* the use of NSO archives and data bases from within the NSO Local Area Networks in Tucson and at Sac Peak, and from NOAO as a whole.

DATA (Gbytes) DOWNLOADED FROM NSO FTP & WWW SITES 01 April - 30 June 2008



PRODUCT DISTRIBUTION BY DOWNLOADED GBYTES

01 April - 30 June 2008

Site	Product Type	Gbytes	%
T	GONG Helioseismology	527.53	72.1%
SP	Realtime Images and Movies (OSPAN, Other)	66.32	9.1%
SP	SMEI Experiment & Data Pages	39.70	5.4%
SP & T	Other	25.56	3.5%
Т	SOLIS/VSM	17.80	2.4%
SP	General Information	12.79	1.7%
SP	Press Releases	12.49	1.7%
Т	GONG (Magnetograms, spectra, time series, frequencies)	11.01	1.5%
SP	Staff Pages	6.10	0.8%
SP	OSPAN Project Pages	2.83	0.4%
SP	Corona Maps & Other Images	2.68	0.4%
Т	FTS (Spectral atlases, general archive)	2.10	0.3%
Т	KPVT (magnetograms, synoptic maps, helium images)	1.35	0.2%
SP	Icon & Background Images	1.34	0.2%
SP	Telescope Home Pages	1.04	0.1%
SP	Public Relations	0.74	0.1%
SP	Adaptive Optics Pages	0.59	0.1%
T	Evans/SP Spectroheliograms (Hα, Calcium K images)	0.01	0.0%
TOTAL		731.97	100.0%

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 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 Other NSO Summer Research Assistantship (SRA) Programs

During this and the start of next quarter, a combination of six REU and three graduate SRA students will have participated in summer research opportunities at locations in Tucson and Sunspot for 2008. Four U.S. astronomy graduate students are participating in the 2008 NSO/GONG 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 IRES program started on 11 June in Bangalore, India under the auspices of the Indian Institute of Astrophysics (IIA). Details about the 2008 program are available at http://eo.nso.edu/ires/.

2. Research Based Science Education (RBSE)

As part of the summer 2008 RBSE solar program, Claude Plymate, with NOAO's Connie Walker, conducted five days of successful observing and data analysis at the McMath-Pierce Solar Telescope with three high school science teachers in June. A fading active region at 1565 nm and velocities in granulation (space-time diagrams) at 1579 nm were observed.

3. Other Educational Outreach

Thirty-five students and faculty attended the third in a series of five weeklong Solar Physics Summer Schools held by the NSO and the University of Arizona's Lunar and Planetary Laboratory (LPL). The school was held 16-20 June at NSO/Sacramento Peak and is designed for advanced undergraduate and beginning graduate students interested in the physics of the Sun and possible careers in solar physics, space physics, or related fields. Lecturers representing NSO included Han Uitenbroek, Irene González Hernández, Aimee Norton, and Matt Penn. Other lecturers were Eugene Parker (University of Chicago), Samuel Krucker (University of California, Berkeley), Spiro Antiochos (Naval Research Lab/NASA-GSFC), Charles Smith (University of New Hampshire), and Joe Giacalone, Randy Jokipii and Tami Rogers (University of Arizona). In addition, several students gave short talks on their own work. Participating students had the opportunity to spend a significant amount of time interacting individually with respective lecturers regarding their specific research, educational concerns and details about having a career in solar physics. Details about the UofA/NSO 2008 Solar Physics Summer School are available at http://www.lpl.arizona.edu/SummerSchool08/.

At the end of June, Claude Plymate delivered a lecture and data collection demonstration remotely (from the McMath-Pierce Solar Telescope facility) to students at Mt. Wilson as part of the Mt. Wilson 2008 Consortium for Undergraduate Research and Education (CUREA) program. The live video lecture was delivered via Skype while data were taken with the NSO Array Camera at 1579 nm. The resulting data were sent in near-real-time to a Web page for the CUREA students to download, reduce and analyze.

On 21 April, Lonnie Cole visited nine 7th and 8th grade science classes and spoke about the Sun, with an emphasis on helioseismology.

During this quarter, Dave Dooling started discussions with representatives from Alabama A&M University and the education office at NASA's Marshall Space Flight Center about minority outreach. Dooling also spoke with Dr. Gail Porter, chair of the physics department at Old Dominion University (15 April) and Dr. Don Michels, ex-NRL scientist a Catholic University professor emeritus (25 June), about science education and public outreach issues.

B. Public Outreach

1. Sunspot Visitor Center

Sunspot Astronomy & Visitor Center Summary of Visitors and Tours (3 Months Ending 06/30/08)				
Group/Program	No. of Visitors			
General Public Tours (Visits to Center and Self-Guided Tours)	4,069			
Guided Public Tours:				
- School Groups K-12	147			
- Special Tours	136			
Total Visitors	4,352			

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

NSO, in collaboration with NOAO Public and Educational Outreach (PAEO), continues to work toward completing the McMath-Pierce "Sunnel," a project to turn the 95-foot long public hallway of the McMath-Pierce Telescope facility into an exhibit for visitors to Kitt Peak to learn more about the Sun, the NSO, and the telescopes and research associated with the NSO. Staff involved in the development of the Sunnel (with Aimee Norton as scientific contact) met approximately six times during this quarter for an hour each time to outline the design and scientific content of the display. The lighting and flooring have been installed, and painting of the walls should be completed by publication of this report. Posters depicting the zones of the Sun are completed and printed but are yet to be backed and mounted. Movie content as examples of the dynamic solar atmosphere have been selected and a hands-on, interactive computer display generated and put on a Mac mini.

Dave Dooling staffed the NSO's exhibit at the 14th Annual Coalition for National Science Funding (CNSF) Exhibition and Reception on 25 June at the Rayburn House Office Building. The exhibit provided Dooling with an opportunity to speak with staffers from the offices of Representative Bart Gordon and Senator Daniel Akaka, among others.

NSO scientific staff presented posters and the NSO was an exhibitor at 27-30 May Solar Physics Division (SPD) meeting held jointly with American Geophysical Union at Fort Lauderdale, Florida. On 26 May, prior to the SPD meeting, NSO exhibited segments of the Sunspot Solar System Model at the Exploration Station sponsored by the SPD EPO. Materials included a 3' x 10' color poster showing the planets to the scale of a STARLAB planetarium dome representing the Sun, and various drawing exercises. Parents and children who attended showed a high level of interest, staying for more than 30 minutes each at the NSO exhibit. The SPD plans a repeat this exhibit at the AGU Fall meeting in San Francisco in December.

On 10 April, a National Geographic film crew interviewed long-term McMath-Pierce Telescope user Don Jennings (NASA/GSFC) during his observing run at the McMath. The interview, including scenes around the telescope will be featured in one of the episodes of an upcoming television series, "The Known Universe."

In mid-May, Aimee Norton was interviewed by Tucson reporter Dan Sorenson, resulting in an article in the *Arizona Daily Star* titled "Sunspot Cycle More Dud Than Radiation Flood" about the solar cycle, featuring NSO and Kitt Peak In addition to Norton, the article quoted Matt Penn and Bill Livingston (http://www.azstarnet.com/metro/239625).

Irene González Hernández presented a talk about the Sun ("El Sol") to ~30 members of the Galileo Astronomy Club from Instituto Senda, Obregon, Mexico on 17 May in the NOAO/NSO main conference room.

At the request of the New Mexico State Park Service, Dave Dooling presented a talk about the National Solar Observatory to a small audience at Elephant Butte Lake State Park on 20 June.

Jackie Diehl provided assistance with a public Star Party conducted by the Alamogordo Astronomy Club at the local Alamogordo Chamber of Commerce on 12 April. Additionally, she provided "on air" interviews with FM Radio Station 97.7 regarding astronomy in the Sacramento Mountains, and gave talks at the Tularosa, NM Career Day on 02 May.

Ruth Kneale represented the ATST and NSO at the annual Special Libraries Association meeting 14-18 June in Seattle, Washington. She moderated the Astronomy Roundtable, coordinated an open house with representatives from the Institute of Physics Publishing, was a conference buddy to a new attendee, and ran a Physics-Astronomy-Math Division book group discussion.

V. Risk Management and Safety Report

Risk Management services at NSO/Kitt Peak and Tucson are shared with NOAO. Therefore, see the "Tucson and Kitt Peak Site Safety Report" section of the NOAO April - June 2008 Quarterly Report for details on risk management activities at NSO/Kitt Peak and Tucson. There are no risk management and safety activities to report for NSO/Sac Peak this quarter.

APPENDIX

National Solar Observatory

01 April - 30 June 2008

April - June 2008: During this period, 34 observing programs, 6 of which were thesis programs involving 7 thesis graduate students, and 3 involving 3 non-thesis graduate students, 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. (RBSE) identifies middle and high school teachers who are 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
10		0.0	4.0	32.0
Claude Plymate	National Solar Observatory			
McMath Engineering				
McMP Main spectrogr	raph			
1858		0.0	10.0	121.0
William Livingston	National Solar Observatory			
Cycle Variability of the S	Solar Spectrum			
McMath-Pierce Solar Tel	escope Main Spectrograph			
2030e		8.0	0.0	160.0
Ronald Oliversen	NASA/Goddard Space Flight Center			
Mierkiewicz	University of Wisconsin-Madison			
Oonaldson (U)	Boston University, Dept. of Physics			
Morgenthaler	University of Washington, Seattle			
Walker (G)	Mount Holyoke College			
Io As a Probe of the Plas	ma Torus			
McMP Stellar spectrog	graph			
2030e		8.0	0.0	128.0
Ronald Oliversen	NASA/Goddard Space Flight Center			
Mierkiewicz	University of Wisconsin-Madison			
Larson (G)	University of Maryland			
Roesler	University of Wisconsin			
Harris	University of Washington, Seattle			
Io As a Probe of the Plas	ma Torus			
McMP Stellar spectrog	graph			
2058		0.0	5.0	70.0
Andrew Potter	National Solar Observatory			
Mouawad	University of Maryland			
van Werkhoven (T)	Universiteit Utrecht, Sterrekundig Instituut			

Studies of Exospheric Emission Lines in the Inner Solar System

Stellar spectrograph

McMP

		Nights	Days	Hours
2125		0.0	11.2	40.0
2127	HOAFD III	0.0	11.3	48.0
Richard Altrock	USAF Research Laboratory			
Three-Line Coronal Photo	ometer			
Evans Solar Facility (ESF)	Sac Peak			
2128		0.0	13.4	38.0
Simon Worden	NASA Ames Research Center			
Keil	National Solar Observatory			
Ca K Solar Rotation				
Evans Solar Facility (ESF)	Sac Peak			
2193		0.0	6.7	56.0
Richard Altrock	USAF Research Laboratory	•••	0.7	20.0
Elrod	National Solar Observatory			
Coronal Photometer Calib				
Evans Facility Sac Peak	ε			
2282n		12.0	0.0	82.0
Donald Jennings	NASA/Goddard Space Flight Center	12.0	0.0	82.0
McCabe	NASA Goddard Space Flight Center			
Sada	Universidad de Monterrey			
Boyle	Dickinson College			
Lunsford	NASA Goddard Space Flight Center			
Zeeman Splitting in OH a				
McMP Main spectrogra	ph			
2282		0.0	12.0	89.0
Donald Jennings	NASA/Goddard Space Flight Center			
McCabe	NASA Goddard Space Flight Center			
Sada	Universidad de Monterrey			
Boyle	Dickinson College			
Lunsford	NASA Goddard Space Flight Center			
Zeeman Splitting in OH a	t 12 Microns			
McMP Main spectrogra	ph			
2375c		0.0	5.0	31.0
Constance Walker	National Optical Astronomy Observatory			
Plymate	National Solar Observatory			

Understanding Active Regions: Using Zeeman-Split & Doppler Shift Measurements of IR Lines to Determine Magnetic Field Strengths & Evershed Flows of Sunspots

McMP Main spectrograph

		Nights	Days	Hours
2439		0.0	5.0	40.0
James LoPresto	Edinboro University of Pennsylvania	0.0	2.0	40.0
Plymate	National Solar Observatory			
Simmons	Mt. Wilson Observatory			
Lazar (T)	Adler Planetarium, Chicago			
Polar Solar Vortex				
McMP FTS/Mc-P				
2488		0.0	5.3	64.0
David Elmore	High Altitude Observatory, NCAR			
Berst	National Solar Observatory			
Spectro-Polarimeter for Infra	red and Optical Regions (SPINOR): Integration & Test.	ing		
	ac Peak	Ü		
2489e		0.0	7.0	80.0
Steve Hegwer	National Solar Observatory	***		
Smaga	National Solar Observatory			
Whitehorse	National Solar Observatory			
Dunn Solar Telescope Mainte	enance			
Dunn Solar Telescope (DST)	Sac Peak			
2520		0.0	5.0	64.0
James LoPresto	Edinboro University of Pennsylvania			
Simmons	Mt. Wilson Observatory			
Lazar	Adler Planetarium, Chicago			
Sunset and Green Flash Obse	ervations			
McMP Main spectrograph				
2523		0.0	5.0	40.0
Matthew Penn	National Solar Observatory			
NSO Array Camera Developn	nent			
McMath-Pierce Solar Telescop	ne Main Spectrograph/NSO Array Camera (NAC)			
2525		0.0	5.0	34.0
Matthew Penn	National Solar Observatory			
Schad (G)	University of Arizona, Lunar & Planetary Laboratory			
NSO Array Camera High-Res	solution Imaging			
McMath-Pierce Solar Telescop	be Main Spectrograph/NSO Array Camera (NAC)			

		Nights	Days	Hours
2521		0.0	0.0	102.0
2531 Haosheng Lin	University of Hawaii, IFA	0.0	9.0	102.0
Jaeggli (T)	University of Hawaii, Institute for Astronomy			
Reardon	INAF - Arcetri Astrophysical Observatory			
	plarimeter (FIRS) Engineering and Science			
Dunn Solar Telescope (DST)	Sac Peak			
2539a		0.0	5.0	38.0
Niek Doelman	TNO Institute of Applied Physics, Delft	•••		2010
Keller	National Solar Observatory			
den Breeje (T)	Delft University of Technology			
van Werkhoven (T)	Universiteit Utrecht, Sterrekundig Instituut			
Testing a Predictive Adaptiv	e Optics Control Algorithm			
McMath-Pierce Solar Telesc	ope Main Spectrograph			
25/1		0.0	- 0	40.0
2561 Gianna Cauzzi	Osservatorio Astrofisico di Arcetri	0.0	7.0	48.0
McIntosh	High Altitude Observatory, NCAR			
	pport to a Whole Heliosphere Interval (WHI) Targeted	d Campaign		
Kitt Peak SOLIS Tower (KP	ST) SOLIS Vector Spectromagnetograph (VSM)			
2562		0.0	7.0	43.0
Craig DeForest	Southwest Research Institute			
Miralles	Harvard-Smithsonian Center for Astrophysics			
SOLIS VSM Observations i	n Support of Low-Latitude Coronal Hole Studies			
Kitt Peak SOLIS Tower (KP				
25//		0.0	9.4	24.0
2566 Roberto Casini	High Altitude Observatory, NCAR	0.0	8.4	24.0
	High Athlude Observatory, NCAR			
Tomczyk	High Altitude Observatory NCAR			
Tomczyk	High Altitude Observatory, NCAR			
Prominence Magnetometer	Observations			
Prominence Magnetometer				
	Observations	0.0	3.0	32.0
Prominence Magnetometer Evans Solar Facility (ESF)	Observations	0.0	3.0	32.0
Prominence Magnetometer Evans Solar Facility (ESF) 2567	Observations Sac Peak	0.0	3.0	32.0
Prominence Magnetometer Evans Solar Facility (ESF) 2567 Linda Brown	Observations Sac Peak Jet Propulsion Laboratory	0.0	3.0	32.0
Prominence Magnetometer Evans Solar Facility (ESF) 2567 Linda Brown Dulick	Observations Sac Peak Jet Propulsion Laboratory National Solar Observatory National Solar Observatory	0.0	3.0	32.0

		Nights	Days	Hours
2568		0.0	5.0	32.0
Debi Prasad Choudhary	California State University, Northridge	0.0	5.0	32.0
Penn	National Solar Observatory			
Three-Dimensional Structure				
	·	7)		
McMath-Pierce Solar Telescop	pe Main Spectrograph/NSO Array Camera (NAC	;)		
2569		0.0	5.0	40.0
Thomas Ayres	University of Colorado, CASA			
Development of CO 5 Micron	Capabilities in Advance of RAISE Rocket Flight			
McMath-Pierce Solar Telescop	oe Main Spectrograph/NSO Array Camera (NAC	E)		
2570		0.0	76.0	455.0
Aimee Norton	National Solar Observatory			
SOLIS Synoptic Observations	,			
Kitt Peak SOLIS Tower (KPS'				
2500		0.0	2.0	140
2580 Eric Galayda	National Solar Observatory	0.0	2.0	14.0
	Ivational Solal Observatory			
KPST Engineering				
Kitt Peak SOLIS Tower (KPS'	Γ)			
2581		0.0	7.0	18.0
Han Uitenbroek	National Solar Observatory			
Fritschler	National Solar Observatory			
DeForest	Southwest Research Institute			
Cauzzi	Osservatorio Astrofisico di Arcetri			
Reardon	INAF - Arcetri Astrophysical Observatory			
Physics of Low-latitude Coro	nal Holes: IBIS Support to a Whole Heliosphere I	nterval (WHI) Targe	eted Campaign	A/DST
Dunn Solar Telescope (DST)	Sac Peak			
2582		0.0	7.0	23.0
Gianna Cauzzi	Osservatorio Astrofisico di Arcetri			
Reardon	INAF - Arcetri Astrophysical Observatory			
Jitenbroek	National Solar Observatory			
McIntosh	High Altitude Observatory, NCAR			

Dunn Solar Telescope (DST) Sac Peak

		Nights	Days	Hours
2583		0.0	11.0	57.0
Kevin Reardon	INAF - Arcetri Astrophysical Observatory			
Berger	Lockheed-Martin Solar & Astrophysics Lab			
Ichimoto	National Astronomical Observatory of Japan			
Suematsu	National Astronomical Observatory of Japan			
Woeger	National Solar Observatory			
Interferometric BIdimensiona	al Spectrometer (IBIS) Service Mode Observing in C	Coordination with I	HINODE	
Dunn Solar Telescope (DST)	Sac Peak			
2584		0.0	12.2	110.0
Thomas Rimmele	National Solar Observatory			
Marino	University of Florida			
Schmidt (T)	Kipenheuer Institut fuer Sonnenphysik			
Waldmann (T)	Kipenheuer Institut fuer Sonnenphysik			
Woeger	National Solar Observatory			
Multi-Conjugate Adaptive Op	tics (MCAO) Development			
Dunn Solar Telescope (DST)	Sac Peak			
2585		0.0	5.3	25.0
Phillip Judge	High Altitude Observatory, NCAR			
Reardon	INAF - Arcetri Astrophysical Observatory			
Cauzzi	Osservatorio Astrofisico di Arcetri			
Casini	High Altitude Observatory, NCAR			
Centeno Elliott	High Altitude Observatory, NCAR			
Stokes Polarimetry of Photosp	phere and Chromosphere			
Dunn Solar Telescope (DST)	Sac Peak			
2585		0.0	5.3	25.0
Phillip Judge	High Altitude Observatory, NCAR			
ites	High Altitude Observatory, UCAR			
McIntosh	High Altitude Observatory, NCAR			
Woeger	National Solar Observatory			
Γritschler	National Solar Observatory			
Stokes Polarimetry of Photosp	phere and Chromosphere			
Ounn Solar Telescope (DST)	Sac Peak			

		Nights	Days	Hours
2586		0.0	7.0	40.0
	A star above and I to stitute Date down	0.0	7.0	40.0
Carsten Denker	Astrophysical Institute Potsdam			
Mann	Astrophysical Institute Potsdam			
Tritschler	National Solar Observatory			
Woeger	National Solar Observatory			
Evolution of Flare Ribbons ar	nd Kernels with High Temporal and Spatial Resolu	tion		
Dunn Solar Telescope (DST)	Sac Peak			
2587		0.0	11.0	68.0
Robert Rutten	Sterrekundig Instituut, Utrecht University			
Uitenbroek	National Solar Observatory			
Cauzzi	Osservatorio Astrofisico di Arcetri			
Chromospheric Fibrils: Opac	ity Comparison and Diagnostic Calibration			
Dunn Solar Telescope (DST)	Sac Peak			
2588		0.0	4.0	26.0
Craig DeForest	Southwest Research Institute	•••	•••	20.0

Craig DeForest Southwest Research Institute

Lamb (T) University of Colorado, Dept. of Astrophysical & Planetary Science

 $Stereoscopic \ High-speed \ Zeeman \ Magnetograph \ (SHAZAM) \ Development \ \& \ Testing$

Dunn Solar Telescope (DST) Sac Peak