Sloan Digital Sky Survey II

2008 SECOND QUARTER REPORT

April 1, 2008 – June 30, 2008

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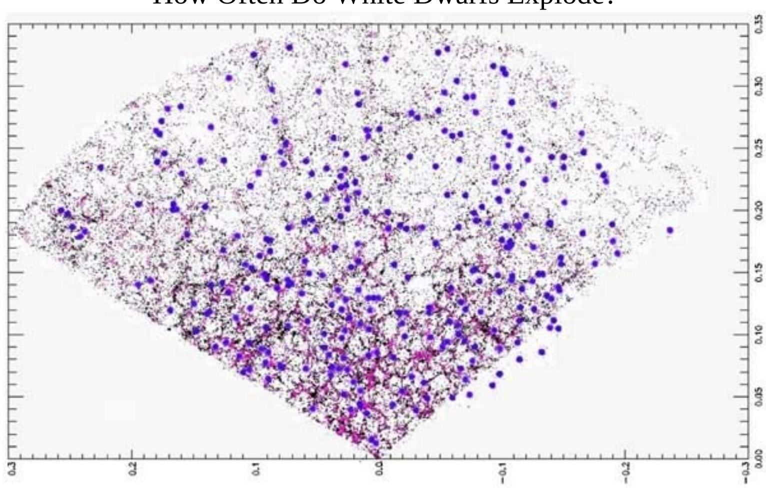
Q2 PERFORMANCE HIGHLIGHTS

- We completed SEGUE spectroscopy on July 14th. We completed a total of 75 SEGUE plates (38 bright and 37 faint, corresponding to 112 plate-equivalents).
- We completed Legacy spectroscopy on May 6th. We completed 35 Legacy spectroscopic plates against a baseline goal of 65 plates.
- We completed the Photometric Telescope calibration program on June 14, 2008.
- The original scientific goals in terms of area covered and spectra obtained were achieved in Q2 for both Legacy and for SEGUE.
- The final version of the SEGUE Stellar Parameter Pipeline was delivered in April 2008.
- We recorded 25.8 million hits on our SkyServer interfaces and processed 3.9 million SQL queries. We also transferred 9.7 terabytes of data through the Data Archive Server interfaces.
- Casjobs reached a milestone this quarter: surpassing 2,000 users in May 2008.
- Q2 cash operating expenses were $1,198K against a baseline budget of $1,196K before management reserve. In-kind contributions were $115K against anticipated contributions of $154K. No management reserve funds were expended.

1. SOME RECENT SCIENCE RESULTS

The following description highlights some of the scientific work accomplished during the reporting interval (bearing in mind that efforts often spill over into other quarters). Unlike the list of publications given in Exhibits 3 the topic selected here is by no means comprehensive, nor even representative, of the science being undertaken by the SDSS collaboration. The short science description nevertheless augments our reporting of activities in SDSS-II.

How Often Do White Dwarfs Explode?



The thermonuclear explosions of white dwarf stars produce brilliant cosmic fireworks. At its peak brightness, a Type Ia supernova can outshine the 10 billion or so stars in its host galaxy, and these explosions produce a large fraction of the iron and heavier elements in the universe. The SDSS-II Supernova Survey is discovering and measuring Type Ia supernovae primarily in order to make precision measurements of the expansion of the universe over the last four billion years. The above diagram shows the locations of Type Ia supernovae (large points) found during the survey's first two seasons (out of three), superposed on the SDSS map of the distribution of galaxies (small points) in the same thin wedge of the sky.

The SDSS-II supernova survey is the first search for relatively nearby supernovae that examines all galaxies in a large volume of space, instead of searching pre-selected galaxies one at a time. University of Chicago graduate student Benjamin Dilday has therefore used the first season's data to address a different question: how often, on average, do these white dwarf explosions occur? The answer, one Type Ia supernova per year per 34,000 cubic megaparsecs, is the best ever determination of the present day supernova rate, with smaller statistical and systematic uncertainties than previous estimates.

The rate measurement is physically significant because we still do not know in detail what triggers Type Ia supernovae -- white dwarfs might be pushed into instability by accreting material from a binary companion or by merging with another white dwarf. By combining their measurement with other measurements that probe earlier cosmic epochs, Dilday et al. show that a substantial fraction of Type Ia supernovae must be "prompt" --- associated with recently formed, massive stars --- while others come from old stars. Further SDSS-II investigations of the types of galaxies that host the supernovae will help pin down the stellar populations that give rise to Type Ia supernovae, giving vital clues to the physical mechanisms that cause these cosmic explosions and produce most of the heavy atoms in the universe.

References:

1. Dilday, B. et al, A Measurement of the Rate of Type Ia Supernovae at Redshift z ~ 0.1 from the First Season of the SDSS-II Supernova Survey, The Astrophysical Journal, Vol 682, p. 262, July 2008.
2. The figure is from: Frieman, J. A. et al., The Sloan Digital Sky Survey-II Supernova Survey: Technical Summary, The Astronomical Journal, Vol 135, p. 338, January 2008.

2. SURVEY PROGESS

The period of accounting for this report includes observing runs spanning the period from April 8, 2008 through July 14, 2008

2.1. Legacy Survey

Table 2.1 compares the imaging and spectroscopic data obtained against the Legacy baseline plan through July 14, 2008. The last Legacy imaging data were obtained in 2006-Q2.

Table 2.1 Legacy Survey Progress in 2008-Q2

	2008-Q2		Cumulative through Q2	
	Baseline	Actual	Baseline	Actual
Legacy Imaging (sq. deg)	0	0	7808	7559
Legacy Spectroscopy (tiles)	65	49	1692	1645

Through the end of the survey, we have completed 1,645 plates in the North Galactic Cap compared to the goal of 1,692 plates. Part of the shortfall is due to the assumption in the baseline plan that we would observe each stripe over its full extent, whereas several stripes are slightly short at one end or the other. In addition, the tiling efficiency has been higher in the past three years due to the availability of large contiguous areas of imaging, so we needed fewer plates to cover the same area of sky.

The key point is that on May 6 we obtained the final spectroscopic plate for Legacy, filling the contiguous region of the North Galactic Cap. In total there are 1802 survey quality plates for Legacy (which includes the three stripes in the South Galactic Cap). The total includes 983,525 unique objects that are spectroscopically classified as galaxies. Thus, for the Legacy survey, we have achieved our original goals.

The following graphs show progress against the baseline plan. Figure 2.1 shows historical progress against the baseline plan for the Legacy Survey. Figure 2.2 shows progress on the spectroscopic survey. In order to provide a better view of progress against plan, the axis scales on Figure 2.2 have been adjusted to show progress made since July 2005, the start of SDSS-II operations.

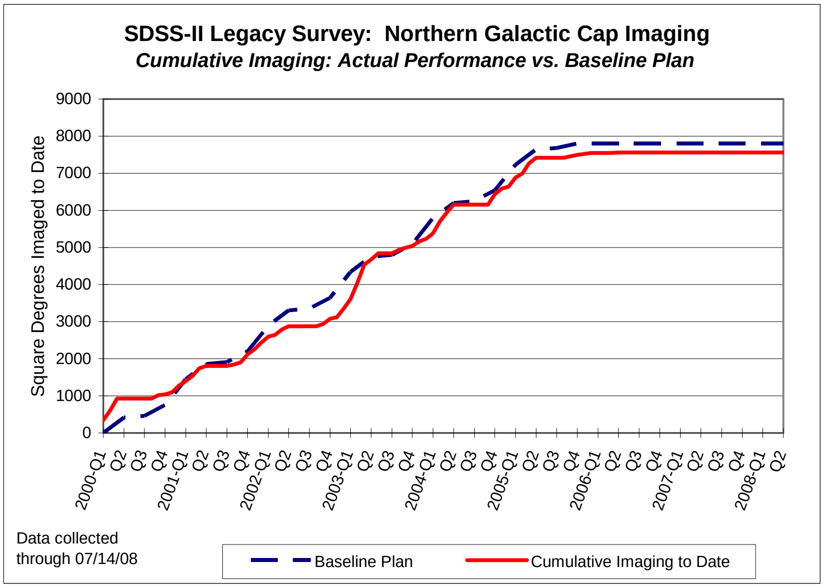


Figure 2.1 Imaging Progress against the Baseline Plan – Legacy Survey

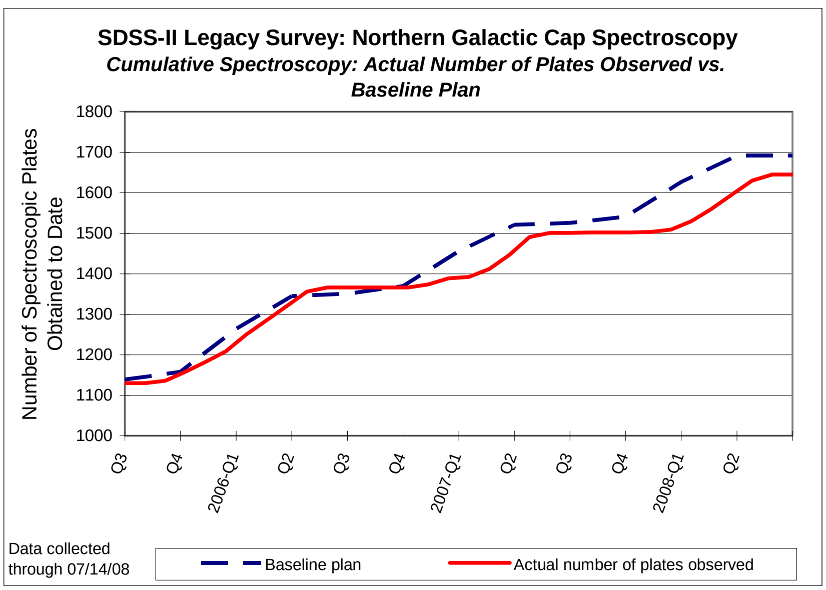


Figure 2.2 Spectroscopic Progress against the Baseline Plan – Legacy Survey

2.2. SEGUE Survey

Table 2.2 compares SEGUE progress against the baseline plan through July 14, 2008.

Table 2.2 SEGUE Survey Progress in 2008-Q2

	2008-Q2		Cumulative through Q2	
	Baseline	Actual	Baseline	Actual
SEGUE Imaging (sq. deg)	0	0	3320	3308
SEGUE Spectroscopy (bright plates)	22	38	206	203
SEGUE Spectroscopy (faint plates)	22	37	206	194

We had the best spectroscopic observing run for this time of year ever. In Q2 a total of 75 SEGUE plates (38 bright and 37 faint, corresponding to 112 plate equivalents) were completed making this a record quarter for SEGUE spectroscopy. This is roughly equivalent to completing 37 SEGUE tiles, against a baseline goal of 22 tiles.

SEGUE has collected a total of 415 plates, including segcluster plates for calibration and early test plates. These are spread over 212 separate directions in the sky, most but not all of which are comprised of a bright/faint pair. These plates contain 247,000 spectra of stars (but a few of these stars are counted twice, and not all spectra have good signal-to-noise ratio, so the “official” count of stellar spectra will be a bit smaller). The originally stated goals for SEGUE were: 3500 square degrees of new imaging; 200 tiles (400 plates with bright/faint pairs); and 240,000 spectra. Thus, we have also met the original goals for SEGUE.

Figure 2.3 shows the current SEGUE layout and progress map, as of July 2008. The plot can be found online at: http://segue.uchicago.edu/skycoverage.html

SEGUE imaging sky coverage and plate layout
July 15, 2008 (Complete)

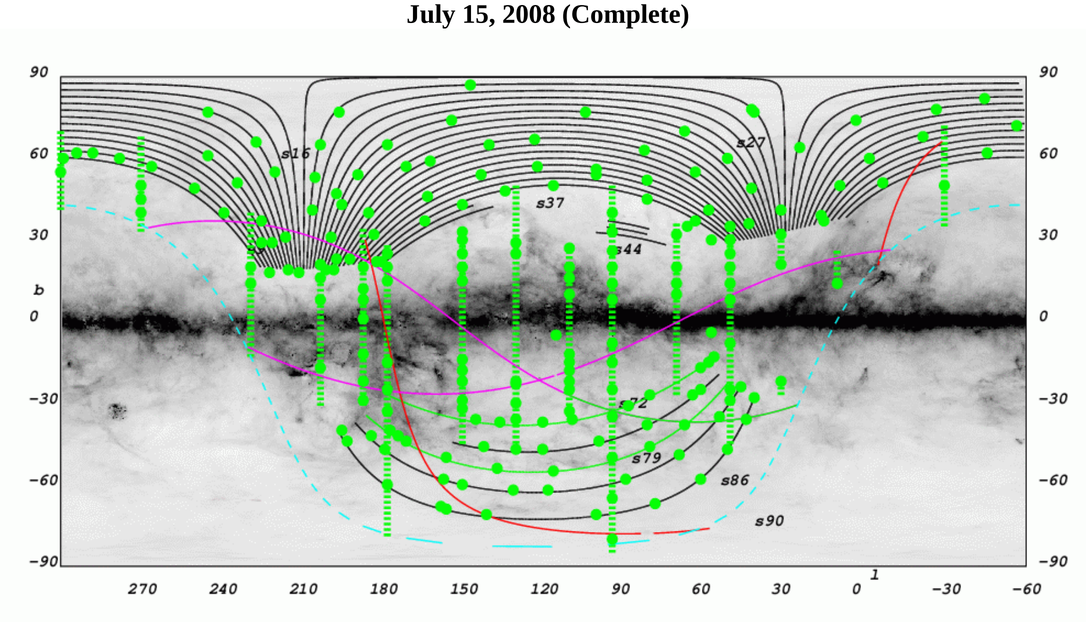


Figure 2.3 SEGUE Imaging Sky Coverage and Plate Layout (as of July 2008).

Figures 2.4 and 2.5 illustrate SEGUE progress against the baseline plan. The imaging graph presents a straightforward comparison of imaging progress against plan. The spectroscopy graph shows the rate at which we completed bright and faint plates separately.

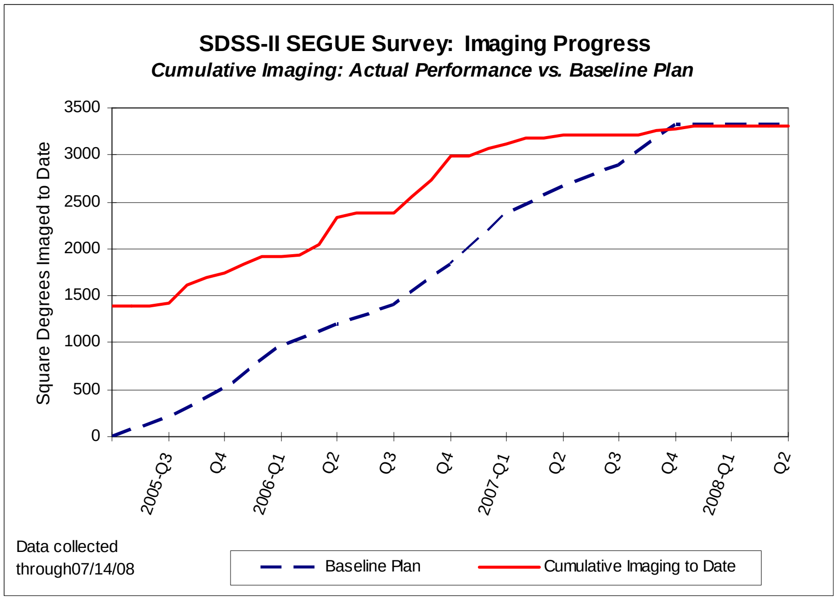


Figure 2.4 Imaging Progress against the Baseline Plan – SEGUE Survey

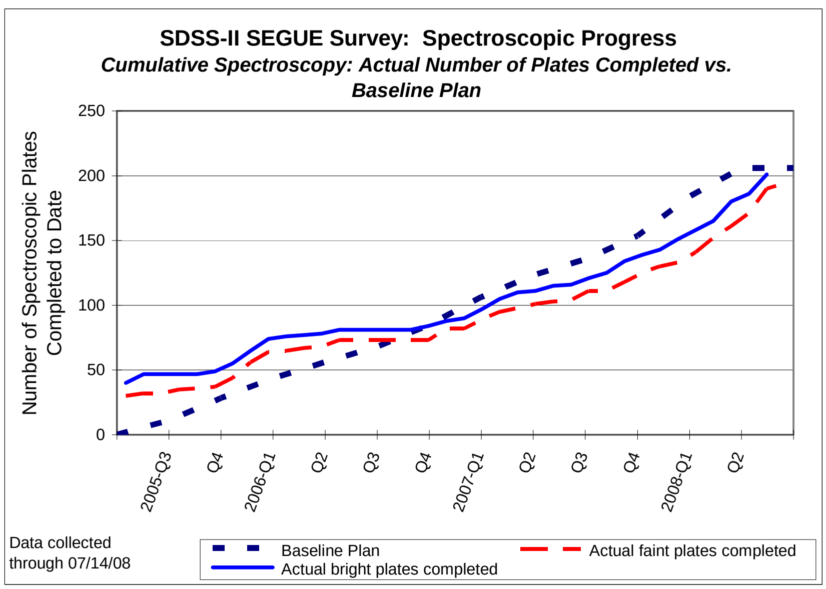


Figure 2.5 Spectroscopic Progress against the Baseline Plan – SEGUE Survey

2.3. Supernova Survey

During the second quarter of 2008, progress on processing and analyzing the supernova data both for use in science analysis and for public release continued. All supernova runs are now available to the public on DRSN. Final photometric processing of confirmed supernovae continued, and a version of the photometry was frozen for public release of the final photometry (with DR7) of the confirmed 2005 supernovae. Work began on final photometric processing of confirmed supernovae from the 2007 run and plans were solidified for final photometric processing of all interesting transients (about 10,000 objects) for all three seasons. To carry out that task, portable disks will be shipped between Fermilab and APO, to use the cycles on the APO compute cluster originally used for supernova data processing. In addition, we made further progress on gathering spectroscopic follow-up data into a central database at Fermilab.

As of this writing, eight papers using and/or describing SDSS supernova data have been submitted for publication; five of these have been published or accepted for publication. Three papers presenting the first-season cosmology results and their implications are nearing completion. A number of proposals to NOAO, Gemini, HST, ESO, APO, and MDM have been recently granted time for further follow-up observations of supernova host galaxies.

2.4. Photometric Telescope

The Photometric Telescope (PT) observed 28 secondary patch sequences during Q2. Of these, 18 were deemed survey quality after processing and 10 were declared bad. We completed the PT calibration program on June 14, 2008.

3. OBSERVING EFFICIENCY

Observing efficiency is summarized according to the categories used to prepare the baseline projection.

3.1. Weather

Table 3.1 summarizes the amount of time lost to weather and Figure 3.1 plots the fraction of suitable observing time against the baseline forecast. Averaged over the quarter, the fraction of available observing time was worse than expected driven by the early arrival of the monsoon season in June. During the month of June we lost 86% of observable time due to weather.

Table 3.1 Potential Observing Hours Lost to Weather in Q2

Observing Condition	Total hours potentially available for observing	Total hours lost to weather	Fraction of time suitable for observing	Baseline Forecast
Dark Time	295	147	50%	60%
Dark & Gray Time	515	263	49%	60%

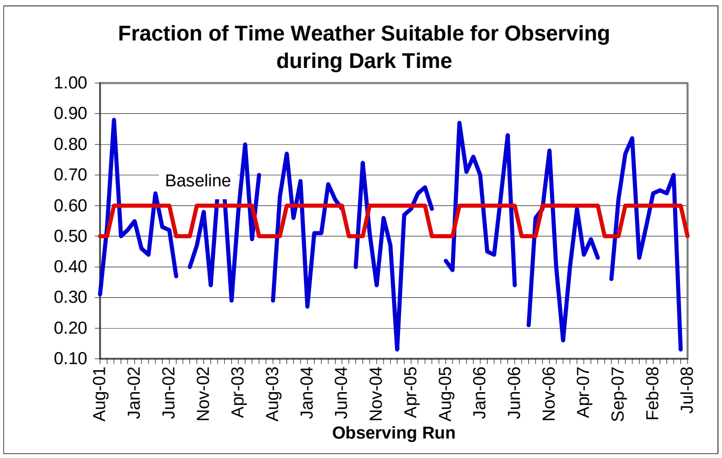


Figure 3.1 Percentage of Time Weather Suitable for Observing

3.2. System Uptime

System uptime measures the availability of equipment when conditions are suitable for observing. Table 3.2 summarizes the total amount of time lost to equipment or system problems and Figure 3.2 plots uptime against the baseline goal.

Table 3.2 Potential Observing Hours Lost to Problems in Q2

Observing Condition	Total hours potentially available for observing	Total hours lost to problems	System Uptime	Baseline Forecast
Dark Time	295	6	98%	90%
Dark & Gray Time	515	7	99%	90%

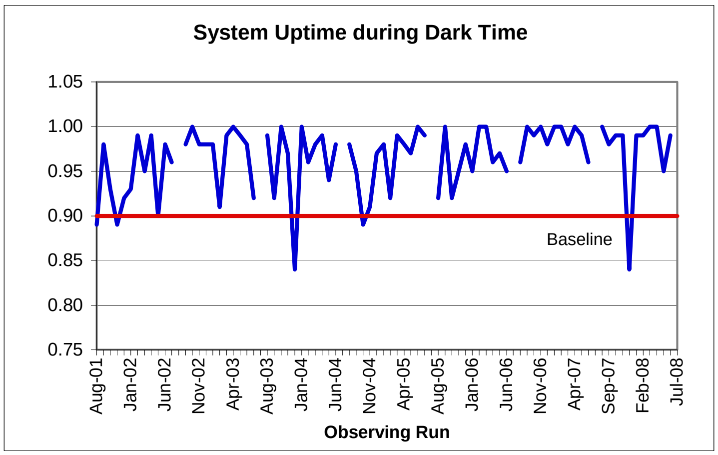


Figure 3.2 System Uptime

3.3. Spectroscopic Efficiency

Spectroscopic efficiency is derived by assessing the time spent performing various activities associated with spectroscopic operations. Table 3.3 provides the median time, by dark run, for various overhead activities associated with spectroscopic operations. Units for all categories are minutes except for efficiency, which is given as the ratio of baseline science exposure time (45 minutes) to total time required per plate. Using these measures, spectroscopic efficiency was above baseline goals; average efficiency in Q2 was 66% against the baseline goal of 64%.

Table 3.3 Median Time for Spectroscopic Observing Activities

Category	*Baseline*	*Run starting Apr 8*	*Run starting May 8*	*Run starting Jun 8*
Instrument change	10	4	4	4
Setup	10	7	8	10
Calibration	5	6	11	6
CCD readout	0	3	3	3
Total overhead	25	20	26	23
Science exposure (assumed)	45	45	45	45
Total time per plate	70	65	71	68
Efficiency	0.64	0.69	0.63	0.66

Figure 3.3 plots spectroscopic efficiency over time.

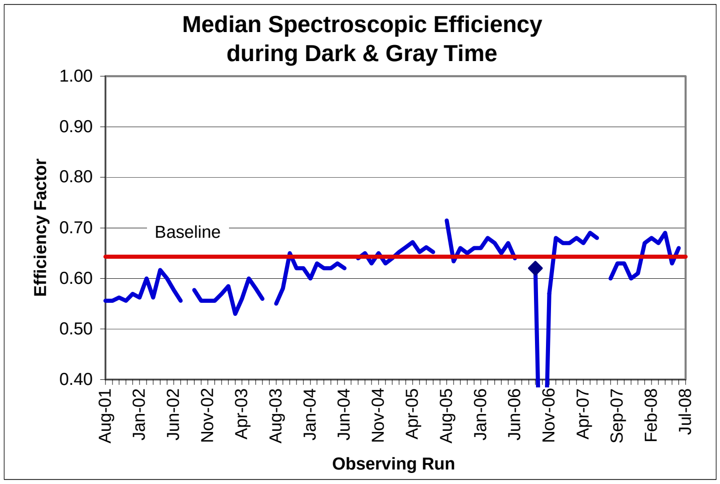


Figure 3.3 Spectroscopic Efficiency

4. OBSERVING SYSTEMS

Observing systems includes the instruments, telescopes, computers and various sub-systems that support observing operations at APO.

4.1. The Instruments

We experienced problems with the imager calibrator, however the calibrator was stable and the observers were able to finish off a complete set of calibration data.

4.2. The 2.5m Telescope

The “B” primary mirror axial actuator was drifting during the quarter. Our investigation found no obvious malfunctions apart from a loose quill. We will examine the actuator internals during summer shut down.

The cloud camera mirror would intermittently cease functioning. We replaced the cover reed switch and the malfunction has not recurred.

A failure in the interlock system was caused by a short circuit in the bump switch system. We repaired the interlock system and removed the bump switch system from the telescope.

The neon/argon lamp failed to start properly due to a timing issue with the starting circuit. The failure was resolved by adding a set of resistors in parallel to this starting system. A new circuit has been designed and will be installed during the summer shut down and tested this fall.

We experienced telescope vibrations due to running the azimuth and rotator axes simultaneously, at close to zenith. We altered the PID parameters in the MCP computer which reduced the vibrations.

We began working on our closeout activities for SDSS-II which includes reviewing and updating the documentation on the telescope's operating and maintenance procedures and disposing of plug plates.

4.3. The Photometric Telescope

We replaced the burned-out motor on the PT dome drop-out shutter and returned the shutter to its original motorized condition.

4.4. Operations Software and the Data Acquisition System

The observing software and DA system were stable over the quarter. No changes were made to either system.

4.5. Observatory Operations

The goals of the second quarter of 2008 were to bring SDSS-II observations to a close. We successfully completed Photometric Telescope observations of secondary patches for SDSS-II, but continued with ancillary PT science projects into July. SDSS-II spectroscopy took the majority of time during second quarter, and enough progress was made to declare SEGUE spectroscopy a success, although approximately ten plates remain unobserved. Most of the unobserved plates were of lower priority fields. A small number of MARVELS pre-selection plates were also observed.

In addition to SDSS-II observing and periodic instrument and telescope calibrations and maintenance, the Observers continued to provide near-real-time data quality assurance and made nightly decisions to acquire survey-quality data in the most efficient way possible. Observers also provided shakedown/shakeup and cloudy-night support of SDSS-II tests. The most important of these tests in the second quarter was a complete set of imager calibrations (gain, linearity and quantum efficiency), which took priority on cloudy nights. On-site observing documentation and procedures were maintained and updated on a regular basis during the quarter. The Observers also donated a portion of their time to education and public outreach activities.

The Observers continued to be involved in individual research and professional development projects, as time permitted. During the second quarter, these projects included:

- Galaxy morphology research to constrain dark matter models in galaxies.
- Participation in studies of dynamical and spectral properties of S0 galaxies (in collaboration).
- Solar physics research (Bayesian image recognition in magnetograms).
- Collaborating with Ukrainian astronomers on cataclysmic variables and oxygen abundances in SDSS galaxies.
- Stellar abundance modeling.
- Continuing the search for Galactic halo planetary nebulae using the SDSS CAS, DAS and the PT.
- Monitoring observer contributions to announced SDSS and SDSS-II "discovery papers."
- Using the SDSS equatorial stripe co-added data to find L and T dwarfs.
- Teaching online astronomy courses.
- Graduate coursework in astronomy.

5. DATA PROCESSING AND DISTRIBUTION

5.1. Data Processing

5.1.1. Software Development and Testing

The principal effort in Q2 has been on processing the SEGUE imaging scans through both PHOTO and the Pan-STARRS image-processing code (psPhot). We experienced challenges due to problems with the psPhot code, some corrupted files, getting these runs properly calibrated via ubercalibration, and getting that calibration information in a form compatible with the databases into which they should be stuffed. This required understanding in detail how aperture corrections were handled differently in psPhot and PHOTO, fixing some bugs in psPhot, and also getting the incremental ubercal code running robustly. We developed some QA web pages to assess the quality of the results, comparing psPhot and PHOTO outputs; in most cases where they disagree, the PHOTO results are more reliable.

We continue to ferret out minor bugs in the new version of PHOTO including making far more robust the treatment of bright stars, and handling aperture corrections in a meaningful way in fields without stars that are sufficiently bright to enable their wings to be measured.

We also have been carrying out diagnostic tests, quantifying the difference in photometry of faint galaxies in the wings of bright galaxies.

In the upcoming quarter, we will focus on documentation of all of the above, and testing of the DR7 data in the CAS.

Work continued by the JINA-MSU team on the development of the SEGUE Stellar Parameter Pipeline (SSPP). The final version of SSPP was delivered in April 2008, and all plates were rerun through it. We will load the latest SSPP results into DR7.2 CAS in Q3.

Our plans for next quarter includes processing and loading of SEGUE imaging and spectra into the DR7.2 CAS and DAS. We also plan to document SEGUE pipelines and science in journal papers.

5.1.2. Data Processing Operations at APO

No data were processed at APO as we were not collecting new supernova data.

5.1.3. Data Processing Operations at Fermilab

We continued processing new data as it arrived. We processed a total of 69 new spectroscopic plates. We performed photometric calibration on the supernova imaging data and completed coaddition of repeat scans of stripe 82.

We transferred reduced imaging data outputs for low-latitude scans from Princeton to Fermilab, and began loading them into the CAS.

Using a list of imaging runs expected to be in the final data release, we generated a list corresponding files that will need to be in the DAS. We took an inventory of which files are available on the data processing cluster, and began systematically recovering or replacing those that were missing. This process will continue into the next quarter.

We also systematically checked the contents of the disk for data that are not backed up on tape but should be, and have begun performing these backups.

In Q3, we will be calculating and applying improved ubercal photometric calibration.

5.2. Data Distribution

Data distribution activities were focused on supporting existing public releases.

5.2.1. Data Usage Statistics

The general public and astronomy community have access to the EDR, DR1, DR2, DR3, DR4, DR5 and DR6 through the DAS and SkyServer interfaces. In addition, the collaboration has access to the Runs DB and DR7.1 released on February 14, 2008.

Figure 5.1 plots the number of web hits we receive per month through the various SkyServer interfaces. In Q2 we recorded an average 8.6 million hits per month, compared to an average 9.6 million hits per month in Q1.

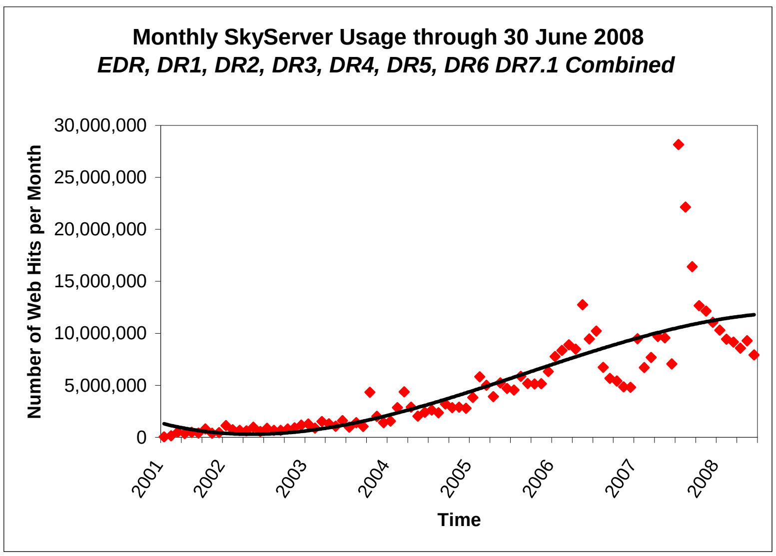


Figure 5.1 SkyServer usage per month, for all public releases combined.

Figure 5.2 shows the total number of SQL queries executed per month. We executed an average 1.3 million queries per month in Q2, compared to an average 1.5 million queries per month in Q1.

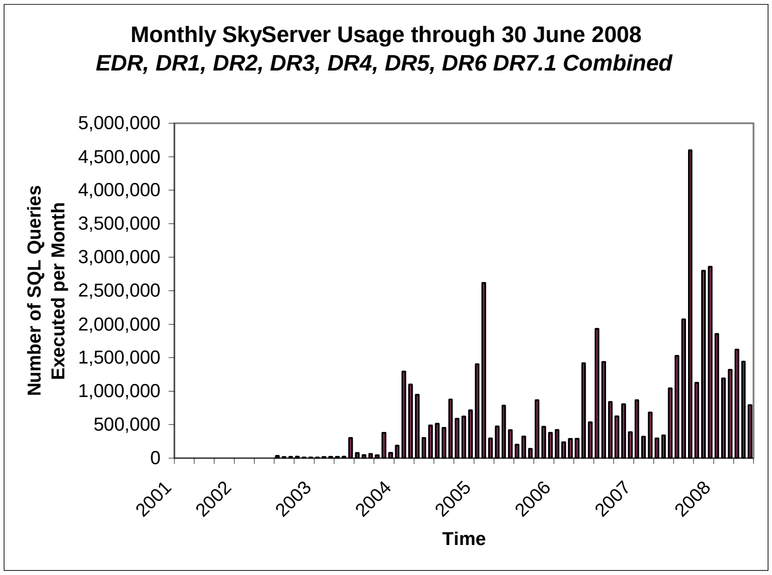


Figure 5.2 SkyServer usage, measured by the number of SQL queries submitted per month.

Through June 30, 2008, the SkyServer interfaces have received over of 419 million web hits and processed 51.9 million SQL queries. Over the past quarter, the SkyServer sites received a total of 25.8 million hits and processed 3.9 million SQL queries.

Figure 5.3 shows the volume of data transferred monthly from the DAS through the rsync server. A total of 5.5 TB of data were transferred via rsync in Q2 compared to 5.8 TB in Q1. As we have seen in the past, the volume of data transferred varies significantly from month to month. By month the amount of data transferred were 0.9 TB in April, 4.2 TB in May, and 0.4 TB in June.

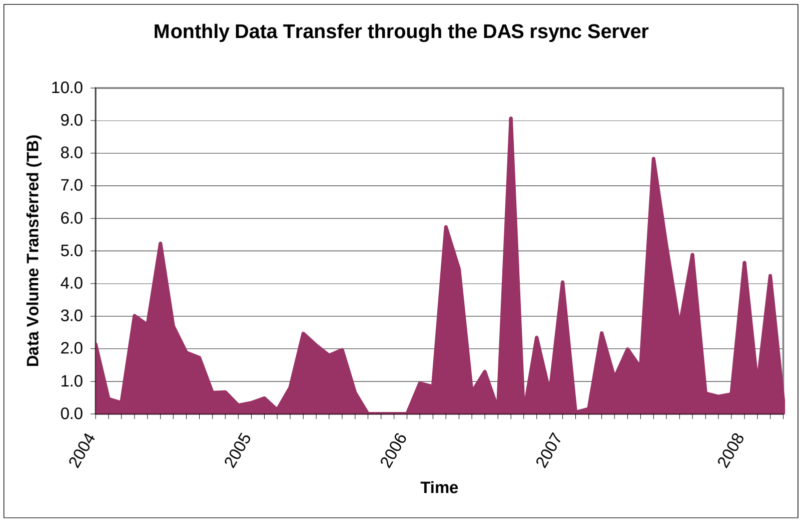


Figure 5.3 Monthly volumes of data transferred via the DAS rsync Server.

Figure 5.4 shows the volume of data transferred monthly through the DAS web interface. A total of 4.2 TB of data were transferred via the web interface in Q2, compared to 13.1 TB in Q1. By month the amount of data transferred were 2.3 TB in April, 0.8 TB in May, and 1.1 TB in June

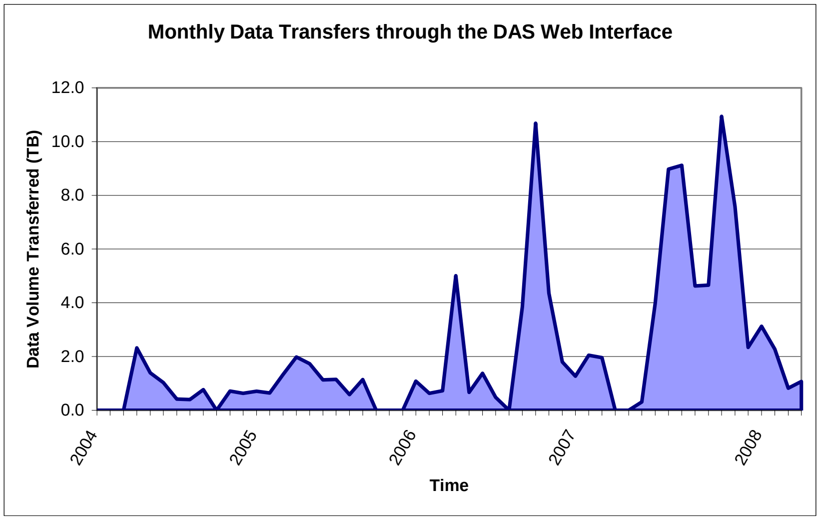


Figure 5.4 Monthly volume of data transferred via the DAS web interface.

5.2.2. Data Archive Server

We continued the reimplementation of the DAS web interface, making the DAS interface independent of the SDSS data processing infrastructure. Testing and documentation of this new interface will continue in Q3.

We began copying directories from the data processing cluster to the network attached storage system. Transfer and auditing of the data on the DAS network attached storage will continue into Q3. Updated and new spectroscopic data will be added, as will files produced by ubercal photometric calibration.

5.2.3. Catalog Archive Server

Work on the Catalog Archive Server (CAS) included addressing problem reports, and providing general support for data distribution operations. A total of 18 problem reports filed through the SDSS Problem-Reporting Database were fixed and closed, including two filed as critical/high against DR7 and sqlLoader.

We loaded the results of the imaging data coaddition and the supernova data calibration into instances of the CAS.

6. SURVEY PLANNING

6.1. Observing Aids

Several programs are used to aid in planning and carrying out observations; no changes were made to these in Q2.

6.2. Target Selection

For this quarter, 41 plates were designed and drilled in three drilling runs. Of these, eight plates were for the Legacy program (North survey area), two were regular SEGUE plates, two were faint SEGUE plates, and 29 plates were test plates for the MARVELs program in SDSS-III.

6.3. Survey Planning

With the pending end of SDSS-II survey operations, the decision was made to focus exclusively on spectroscopy in order to provide the greatest opportunity to finish off all existing Legacy plates and to maximize the amount of SEGUE spectroscopic data that could be collected. This decision meant that there still remain a few areas within the Legacy footprint with sub-standard imaging (however, all of the footprint has at least some imaging).

The MARVELs plates were scheduled for observing during times when no other high priority survey plates could be observed, either due to bright moon or exhaustion of all plates during certain times of the night.

7. EDUCATION AND PUBLIC OUTREACH

We sent out a message to the general mailing list of SDSS asking for examples of how SDSS scientists had used elements of the project in education courses, workshops, etc. We received a number of responses and will produce a report on this during the next quarter.

We gave a presentation on the SkyServer website and its education projects to an orientation session for eight teachers who want to offer Astronomy 101 in their high schools during the 2008-2009 school year.

We continued to explore how Google Sky can link to SkyServer education materials. The results of two workshops with formal and informal educators and Google Sky are being incorporated into the planning for a workshop that will help educators use Google Sky in their classrooms and other settings. Particularly for the classrooms and for educators at the high school levels and above, the SkyServer education projects will be presented as opportunities for advanced explorations.

8. COST REPORT

The operating budget that the Advisory Council accepted and the Board of Governors approved for the period January 1 through December 31, 2008 consists of $403K of anticipated in-kind contributions from Fermilab, the University of Chicago (UC), the Johns Hopkins University (JHU), the University of Washington (UW), and the Joint Institute for Nuclear Astrophysics (JINA); and $4,018K for ARC-funded cash expenses.

Table 8.1 shows forecast cost performance for ARC-funded cash expenses in Q2. More complete tables comparing forecast to baseline performance are included in the appendices of this report. Exhibit 1 compares cash expenses to the budget by quarter and annually. Exhibit 2 compares forecast in-kind contributions to the budget by quarter and annually.

Table 8.1 Q2 Cash Expenses and Forecast for 2008 ($K)

Category	2008 – 2nd Quarter Baseline Budget	2008 – 2nd Quarter Forecast Expenses	2008 Operations Budget Total (for the period Jan-Dec 2008) Baseline Budget	2008 Operations Budget Total (for the period Jan-Dec 2008) Forecast Expenses
1. Survey Management	149	124	488	472
2. Survey Operations				
2.1. Observing Systems	159	87	412	275
2.2. Observatory Operations	468	452	1,255	1,185
2.3. Data Processing	273	323	782	760
2.4. Data Distribution	130	196	411	474
2.5. ARC Support for Survey Ops	9	9	27	27
3. New Development				
3.1. SEGUE Development	0	0	0	0
3.2. Supernova Development	0	0	0	0
3.3. DA Upgrade	0	0	0	0
3.4. Photometric Calibration	0	0	0	0
4. ARC Corporate Support	9	9	31	31
Sub-total	1,196	1,198	3,406	3,225
5. Management Reserve	175	0	613	613
Total	1,371	1,198	4,018	3,838

8.1. Q2 Performance - In-kind Contributions

The sum of in-kind contributions in Q2 was $115K against the baseline budget of $154K. In-kind contributions were provided by Fermilab, JHU, and UW, as follows:

- Fermilab provided support for survey management, data processing and data distribution activities. Effort was also provided to support oversight, planning, and development work for the SEGUE and Supernova projects. The level of in-kind effort required from Fermilab was less than budgeted.
- JHU provided support for the development, loading and hosting of databases associated with the CAS, CasJobs, and SkyServer.
- UW contributed the overhead associated with the plate drilling operation as anticipated.

8.2. Q2 Performance – ARC Funded Cash Expenses

ARC-funded expenses before management reserve in Q2 of $1,198K were at budget.

Survey Management costs were $124K against a budget of $149K. Expenses to support the project scientist, EPO Coordinator, survey management and project management were less than budgeted, driven by reduced travel by the EPO coordinator and work constraints at Fermilab which limited the amount of time employees were available to work. Expenses to support the ARC business manager and secretary were higher than planned due to a different accounting allocation of expenses than planned between ARC and UW accounts. All other survey management costs were as anticipated. For the year, the revised forecast for Survey Management expenses is $472K, or $16K (3%) below the baseline budget of $488K.

Observing Systems costs were $87K against a budget of $159K. Fermilab personnel costs were lower than budgeted due work constraints at Fermilab. Princeton, and ARC observing systems support costs were as anticipated. The UW expenses were lower than anticipated due to a different accounting allocation of expenses than planned between ARC and UW accounts. For the year, the revised forecast for Observing Systems expenses is $275K, or $137K (33%) below the baseline budget of $412K.

Observatory Support costs were $452K against a budget of $468K. NMSU personnel, equipment and supplies expenses were less than anticipated. For the year, the revised forecast for Observatory Support expenses is $1,185K, or $70K (6%) below the baseline budget of $1,255K.

Data Processing costs were $323K against a budget of $273K. Fermilab expenses were greater than budgeted because delivery of new hardware planned in Q1 was delayed until the second quarter. For the year, the revised forecast for Data Processing costs is $760K, or $22K (3%) below the baseline budget of $782K.

Data Distribution costs were $196K against a budget of $130K. FNAL personnel expenses were less than budgeted due to work constraints which reduced employees working hours. JHU expenses were greater than budgeted due to accounting timing of expenses from Q1 and Q4 2007. For the year, the revised forecast for Data Distribution costs is $474K, $63K (15%) above the baseline budget of $411K driven by accounting issues that resulted in the carryover into 2008 of some JHU 2007 Q4 expenses.

ARC Support for Survey Operations costs and Miscellaneous ARC corporate expenses (i.e., audit fees, bank fees, petty cash, and APO trailer rentals) were as anticipated.

8.3. Q2 Performance - Management Reserve

No management reserve funds were expended in Q2.

9. PUBLICATIONS

In Q2, there were four papers based on not-yet-pubic SDSS data that were published by members of the SDSS collaboration and not previously reported. There were also 148 papers published by individuals outside of the collaboration, using publicly available data. Exhibit 3 lists papers published by members of the SDSS Collaboration; Exhibit 4 lists papers published by individuals outside of the SDSS collaboration.

Exhibit 1 CY2008 Cash Expenses ($000s)

SDSS-II CY2008 Cost Performance as of June 30, 2008

			Qtr 1 Jan-Mar	Qtr 2 Apr - Jun			Qtrs 3-4 Jul-Dec			CY2008 Total		
		Inst	Actual Expenses	Approved Baseline Budget	Actual Expenses	Variance % H/(L)	Approved Baseline Budget	Revised Forecast	Variance % H/(L)	Approved Baseline Budget	Revised Forecast	Variance % H/(L)
OPERATIONS BUDGET - CASH EXPENSES												
1.0 Survey Management												
SSP-221	ARC Secretary/Treasurer	ARC	6	5	6	13%	7	7	---	16	18	14%
SSP-234	ARC Business Manager	ARC	20	14	19	40%	36	36	---	63	75	19%
SSP-246	PU Office of the Project Scientist	PU	.3	4	.1	(97%)	64	64	---	72	64	(11%)
SSP-248	FNAL Support for Survey Management	FNAL	20	36	20	(44%)	26	37	42%	92	77	(16%)
SSP-267	UC Support for Survey Management	UC	13	14	12	(11%)	36	37	3%	63	61	(3%)
SSP-270	UW Support for EPO Coordinator	UW	19	18	8	(57%)	6	14	125%	47	41	(12%)
SSP-291A	ARC Support for Public Affairs	ARC	8	8	8	---	0	0	---	15	15	---
SSP-291B	ARC Support for Spokesperson	ARC	3	2	2	---	4	4	---	9	9	---
SSP-291C	ARC Support for Collaboration Affairs	ARC	42	38	38	---	8	8	---	87	87	---
SSP-291i	ARC Support for Public Information Officer	ARC	8	8	8	---	0	0	---	16	16	---
SSP-291K	ARC Support for Young Astronomers Travel Fund	ARC	5	5	5	---	0	0	---	10	10	---
	Survey Management Sub-total		**142**	**149**	**124**	(17%)	**187**	**207**	11%	**488**	**472**	(3%)
2.0 Survey Operations												
2.1 Observing Systems												
SSP-231	UW Observing Systems Support	UW	25	60	19	(68%)	0	0	---	119	44	(63%)
SSP-232	PU Observing Systems Support	PU	12	12	12	7%	0	0	---	23	24	3%
SSP-242	FNAL Observing Systems Support	FNAL	69	76	48	(38%)	57	57	---	233	174	(25%)
SSP-261	FNAL Data Acquisition System Support	FNAL	2	3	0	(100%)	0	1	---	6	3	(52%)
SSP-291D	ARC Observing Systems Support	ARC	23	8	8	---	0	0	---	30	30	---
	Observing Systems Sub-total		130	159	87	(45%)	57	58	2%	412	275	(33%)
2.2 Observatory Support												
SSP-235	NMSU Site Support	NMSU	387	438	422	(4%)	312	309	(1%)	1,188	1,118	(6%)
SSP-302	UW SDSS Systems Engineering Support	UW	3	18	18	(1%)	0	15	---	35	35	(0%)
SSP-272	JHU Support for APO Site Management	JHU	12	12	12	0%	8	8	---	32	32	0%
	Obseratory Support Sub-total		402	468	452	(3%)	320	332	4%	1,255	1,185	(6%)
2.3 Data Processing												
SSP-240	FNAL Software and Data Processing Support	FNAL	112	141	203	44%	100	126	25%	459	440	(4%)
SSP-238	PU Software and Data Processing Support	PU	94	107	101	(6%)	67	70	4%	267	264	(1%)
SSP-239	UC Software and Data Processing Support	UC	20	25	20	(23%)	5	17	241%	56	56	---
	Data Processing Sub-total		225	273	323	18%	172	212	23%	782	760	(3%)
2.4 Data Distribution												
SSP-268	FNAL Data Distribution Support	FNAL	103	108	104	(4%)	90	105	17%	316	312	(1%)
SSP-237	JHU Data Archive Development and Support	JHU	17	22	92	321%	26	54	106%	95	163	71%
	Data Distribution Sub-total		119	130	196	50%	116	159	38%	411	474	15%
2.5 ARC Support for Survey Operations												
SSP91f	ARC Additional Scientific Support	ARC	15	5	5	---	0	0	---	20	20	---
SSP91h	ARC Observers' Research Support	ARC	4	4	4	---	0	0	---	7	7	---
	Data Distribution Sub-total		18	9	9	---	0	0	---	27	27	---
	Survey Operations Sub-total		**895**	**1,038**	**1,065**	3%	**665**	**761**	14%	**2,886**	**2,721**	(6%)

Exhibit 1 CY2008 Cash Expenses (continued)

SDSS-II CY2008 Cost Performance as of June 30, 2008

		Inst	Qtr 1 Jan-Mar Actual Expenses	Qtr 2 Apr-Jun Approved Baseline Budget	Qtr 2 Apr-Jun Actual Expenses	Qtr 2 Apr-Jun Variance % H/(L)	Qtrs 3-4 Jul-Dec Approved Baseline Budget	Qtrs 3-4 Jul-Dec Jul-2008 Forecast	Qtrs 3-4 Jul-Dec Variance % H/(L)	CY2008 Total Approved Baseline Budget	CY2008 Total Jul-2008 Forecast	CY2008 Total Variance % H/(L)
3.0 New Development												
3.1 SEGUE Survey Development												
SSP-138	PU SEGUE Software Development	PU	0	0	0	---	0	0	---	0	0	---
SSP271	OSU Scientific Support	ARC	0	0	0	---	0	0	---	0	0	---
SSP273	UCSC Scientific Support	ARC	0	0	0	---	0	0	---	0	0	---
SSP-268	FNAL Data Distribution Support	FNAL	0	0		---	0	0	---	0	0	---
	SEGUE Development Sub-total		0	0	0	---	0	0	---	0	0	---
3.2 Supernova Survey Development										0	0	---
	No allocation		0	0	0	---	0	0	---	0	0	---
	Supernova Development Sub-total		0	0	0	---	0	0	---	0	0	---
3.3 Data Acquisition System Upgrade												
	No allocation		0	0	0	---	0	0	---	0	0	---
	DA Upgrade Sub-total		0	0	0	---	0	0	---	0	0	---
3.4. Photometric Calibration Development												
SSP-138	PU Photometric Calibration Development	PU	0	0	0	---	0	0	---	0	0	---
	Photometric Calibration Sub-total		0	0	0	---	0	0	---	0	0	---
	New Development Sub-total		**0**	**0**	**0**	---	**0**	**0**	---	**0**	**0**	---
4.0 ARC Corporate Support												
SSP291e	ARC Corporate Support	ARC	9	9	9	---	13	13	---	31	31	---
SSP291g	ARC Capital Improvements	ARC	0	0	0	---	0	0	---	0	0	---
	ARC Corporate Support Sub-total		**9**	**9**	**9**	---	**13**	**13**	---	**31**	**31**	---
Cash Budget Sub-total			**1,045**	**1,196**	**1,198**	0%	**865**	**981**	13%	**3,406**	**3,225**	(5%)
5.0 Management Reserve		ARC	0	175	0	(100%)	263	613	133%	613	613	0%
TOTAL CASH BUDGET			**1,045**	**1,371**	**1,198**	(13%)	**1,127**	**1,594**	41%	**4,018**	**3,838**	(4%)

Exhibit 2 CY2008 In-Kind Contributions ($000s)

SDSS-II CY2008 Cost Performance as of June 30, 2008

			Qtr 1 Jan-Mar	Qtr 2 Apr-Jun			Qtrs 3-4 Jul-Dec			CY2008 Total		
		Inst	Actual Expenses	Approved Baseline Budget	Actual Expenses	Variance % H/(L)	Approved Baseline Budget	Jul-2008 Forecast	Variance % H/(L)	Approved Baseline Budget	Jul-2008 Forecast	Variance % H/(L)
OPERATIONS BUDGET: IN-KIND												
1.0 Survey Management												
SSP-248	FNAL Support for Survey Management	FNAL	24	22	19	(15%)	30	29	(3%)	75	85	14%
	Survey Management Sub-total		**24**	**22**	**19**	(15%)	**30**	**29**	(3%)	**75**	**85**	14%
2.0 Survey Operations												
2.1 Observing Systems												
SSP-231	UW Observing Systems Support	UW	15	15	15	---	0	0	---	30	60	100%
	Observing Systems Sub-total		15	15	15	---	0	0	---	30	60	100%
2.3 Data Processing												
SSP-239	UC Software and Data Processing Support	UC	5	5	7	33%	0	0	---	10	22	112%
SSP-240	FNAL Software and Data Processing Support	FNAL	75	85	48	(43%)	42	57	35%	211	299	41%
SSP-269	MSU SEGUE Software Development and Support	MSU	0	0	0	---	0	0	---	0	0	---
	Data Processing Sub-total		80	90	55	(39%)	42	57	35%	222	320	44%
2.4 Data Distribution												
SSP-237	JHU Data Archive Development and Support	JHU	(9)	11	6	(44%)	0	22	---	22	19	(14%)
SSP-268	FNAL Data Distribution Support	FNAL	17	16	20	24%	22	22	---	54	67	24%
	Data Distribution Sub-total		8	27	26	(3%)	22	44	103%	76	86	13%
	Survey Operations Sub-total		**103**	**132**	**96**	(27%)	**64**	**101**	58%	**328**	**466**	42%
3.0 New Development												
3.1 SEGUE Survey Development												
SSP-237	JHU Data Archive Development and Support	JHU	0	0	0	---	0	0	---	0	0	---
SSP-269	MSU SEGUE Software Development and Support	MSU	0	0	0	---	0	0	---	0	0	---
	SEGUE Development Sub-total		0	0	0	---	0	0	---	0	0	---
	New Development Sub-total		**0**	**0**	**0**	---	**0**	**0**	---	**0**	**0**	---
TOTAL IN-KIND CONTRIBUTIONS			**127**	**154**	**115**	(25%)	**94**	**130**	38%	**403**	**551**	37%
TOTAL OPERATING BUDGET (Cash and In-kind)			**1,172**	**1,526**	**1,314**	(14%)	**1,221**	**1,724**	41%	**4,421**	**4,389**	(1%)

Exhibit 3 Papers from within the SDSS Collaboration

Data Release

1. The Sixth Data Release of the Sloan Digital Sky Survey. ApJ Supplement Series 2008, 175, 297-313 — Jennifer K. Adelman-McCarthy arXiv:0707.3413

Collaboration

2. Galactic Globular and Open Clusters in the Sloan Digital Sky Survey. I. Crowded Field Photometry and Cluster Fiducial Sequences in ugriz. ApJ Supplement Series 2008, submitted – Deokkeun An

3. Luminosity Function Constraints on the Evolution of Massive Red Galaxies Since z~0.9. ApJ 2008, accepted — Richard J. Cool

4. The Detection of an Ultraviolet Excess in the Spectra of SDSS High-Redshift Type Ia Supernovae. ApJ 2008, submitted — Ryan J. Foley

Exhibit 4 Publications Based on Public Data

1. Luminous red galaxies in hierarchical cosmologies. MNRAS 2008, 386, 2145-2160 — C. Almeida arXiv:0710.3557

2. Two More Candidate AM Canum Venaticorum (am CVn) Binaries from the Sloan Digital Sky Survey. AJ 2008, 135, 2108-2113 — Scott F. Anderson

3. Galactic Satellite Systems: Radial Distribution and Environment Dependence of Galaxy Morphology. MNRAS 2008, submitted — H. B. Ann

4. Cosmonet: Fast Cosmological Parameter Estimation in Non-flat Models Using Neural Networks. MNRAS 2008, 387, 1575-1582 — T. Auld

5. Galaxy Concentrations Are Trimodal. MNRAS 2008, 385, 2835-1845 — Jeremy Bailin arXiv:0801.2774

6. On the Galaxy Stellar Mass Function, the Mass-Metallicity Relation, and the Implied Baryonic Mass Function MNRAS 2008, accepted — I. K. Baldry

7. Robust Machine Learning Applied to Astronomical Datasets III: Probabilistic Photometric Redshifts for Galaxies and Quasars in the SDSS and GALEX. ApJ 2008, accepted — Nicholas M. Ball

8. Automated classification of sloan digital sky survey (SDSS) stellar spectra using artificial neural networks. Astrophysics and Space Science, Online First 2008 — Mahdi Bazarghan

9. The Accretion Origin of the Milky Way's Stellar Halo. ApJ 2008, 680, 295-311 — Eric F. Bell arXiv:0706.0004

10. Galaxy Bulges and Their Black Holes: a Requirement for the Quenching of Star Formation. ApJ 2008, in press — Eric F. Bell

11. Percolation Galaxy Groups and Clusters. VizieR On-line Data Catalog: J/ApJS/167/1. Originally published in: 2006ApJS..167....1B —A. A. Berlind

12. Estimation of Galactic model parameters in high latitudes with SDSS. PASA 2008, accepted — S. Bilar

13. Halo-model signatures from 380000 Sloan Digital Sky Survey luminous red galaxies with photometric redshifts. MNRAS 2008, 385, 1257-1269 — Chris Blake arXiv:0704.3377

14. Probing dark energy inhomogeneities with supernovae. Journal of Cosmology and Astroparticle Physics 2008, Issue 06, pp. 027 — Michael Blomqvist arXiv:0806.0496

15. The Sloan Lens ACS Survey. V. The Full ACS Strong-Lens Sample. Ap. J 2008, accepted — Adam S. Bolton

16. The Transparency of Galaxy Clusters. ApJ 2008, to be submitted — Jo Bovy

17. Light and motion in SDSS Stripe 82: the catalogues. MNRAS 2008, 386, 887-902 — D. M. Bramich arXiv:0801.4894

18. New insights into the stellar content and physical conditions of star-forming galaxies at z = 2-3 from spectral modeling. MNRAS 2008, 385, 769-782 — Jarle Brinchmann arXiv:0801.1678

19. The Period-Luminosity Relation of RR Lyrae Stars in the SDSS Photometric System. ApJ Supplement Series 2008, in press — C. Caceres

20. Observational constraints on late-time $\Delta(t)$ cosmology. Physical Review D 2008, vol. 77, Issue 8, id. 083504 — S. Carneiro arXiv:0711.2686

21. Large-scale modulation of star formation in void walls. MRNAS Letters 2008, submitted — Laura Ceccarelli

22. Environment and mass dependencies of galactic λ spin parameter: cosmological simulations and observed galaxies compared. MNRAS 2008, Online Early — B. Cervantes-Sodi arXiv:0712.0842

23. Color dependence in the spatial distribution of satellite galaxies. Astronomy and Astrophysics 2008, 484, 347-354 — J. Chen arXiv:0711.0989

24. Maximum Likelihood Fitting of Tidal Streams With Application to the Sagittarius Dwarf Tidal Tails. ApJ 2008, accepted — Nathan Cole

25. Coupled quintessence and vacuum decay. Phys Rev D 2008, vol. 77, issue 8, id.083516 — F. E. M. Costa arXiv:0708.3800

26. The ChaMP Extended Stellar Survey (ChESS): Photometric and Spectroscopic Properties of Serendipitously Detected Stellar X-ray Sources. ApJ Supplement Series 2008, accepted — K. R. Covey

27. Quasar candidates selection in the Virtual Observatory era. arXiv:0805.0156 — R. D'Abrusco

28. Compact groups of galaxies (CGs) from the SDSS Data Release 6. Central European Journal of Physics 2008m Volume 6, Issue 2, pp.185-193 — Xin-Fa Deng

29. Numerical Color-Magnitude Diagram Analysis of Sloan Digital Sky Survey Data and Application to the New Milky way Satellites. AJ 2008, 135, 1361-1383 — J. T. A. de Jong arXiv:0708.3758

30. Effects of both extremes of environments on galaxy properties. Astronomy and Astrophysics 2008, 484, 355-360 — X.-F. Deng

31. Effects of Interactions on Galaxy Properties in the Main Galaxy Sample of SDSS Data Release 5. ApJ 2008, 677, 1040-1045 — Xin-Fa Deng

32. Further Studies of the Local Environmental Dependence of Galaxy Properties. Pub ASP 2008, 120, 487-491 —Xin-Fa Deng

33. The properties of galaxy groups from the luminous red galaxies (LRGs) of SDSS DR6. Astroparticle Physics 2008, 29, 340-344 — Xin-Fa Deng

34. The CMB Quadrupole depression produced by early fast-roll inflation: MCMC analysis of WMAP and SDSS data. Phys Rev D 2008, accepted — C. Destri

35. Orbital periods of cataclysmic variables identified by the SDSS - III. Time-series photometry obtained during the 2004/5 International Time Project on La Palma. MNRAS 2008, 386, 1568-1578 —M. Dillon arXiv:0803.0010

36. Optical Cluster Finding with an Adaptive Matched-Filter Technique: Algorithm and Comparison with Simulations. ApJ 2008, 676, 868-879 — Feng Dong arXiv:0709.0759

37. The Fundamental Plane of Early Type Galaxies in Nearby Clusters from the WINGS Database. ApJ 2008, submitted — M. D'Onofrio

38. The Dartmouth Stellar Evolution Database. ApJ Supplement Series 2008, accepted — Aaron Dotter

39. Hot DQ White Dwarfs: Something Different. ApJ 2008, accepted — P. Dufour

40. Galaxy Pairs in the Sloan Digital Sky Survey. I. Star Formation, Active Galactic Nucleus Fraction, and the Mass-Metallicity Relation. AJ 2008, 135, 1877-1899 — Sara L. Ellison arXiv:0803.0161

41. A Detection of Dark Matter Halo Ellipticity using Galaxy Cluster Lensing in SDSS. ApJ 2008, submitted— Anna Kathinka Dalland Evans arXiv:0806.2723

42. Mass and Redshift Dependence of Star Formation in Relaxed Galaxy Clusters. ApJ 2008, 679, 279-292 — Rose A. Finn arXiv:0802.2282

43. A Survey of the Metal Content of the Intergalactic Medium at High-redshift (II) : OVI line density, space density and gas metallicity at z_abs = 3.0. AJ 2008, submitted — S. Frank

44. Supernovae in Early-Type Galaxies: Directly Connecting Age and Metallicity with Type Ia Luminosity. ApJ 2008, accepted — J. S. Gallagher

45. Support vector machines and kd-tree for separating quasars from large survey data bases. MNRAS 2008, 386, 1417-1425 — Dan Gao

46. HI content and other structural properties of galaxies in the Virgo cluster from the Arecibo Legacy Fast ALFA Survey. Astronomy and Astrophysics 2008, 482, 43-52 — Gavazzi, G. arXiv:0802.1622

47. The Sloan Lens ACS Survey. VI. Discovery and Analysis of a Double Einstein Ring. ApJ 2008, 677, 1046-1059 — Raphael Gavazzi arXiv:0801.1555

48. Fundamental Planes and the Barless M_{bh}-σ Relation for Supermassive Black Holes. ApJ 2008, 680, 143-153 — Alister W. Graham arXiv:0801.1548

49. An Imprint of Super-Structures on the Microwave Background due to the Integrated Sachs-Wolfe Effect. ApJ Letters 2008, submitted — Benjamin R. Granett

50. The SDSS-GALEX viewpoint of the truncated red sequence in field environments at z ~ 0. MNRAS 2008, 385, 1201-1210 — C. P. Haines arXiv:0707.2361

51. The Big Toe of Hercules, A Moving Group 44 kpc from the Sun. ApJ Letters 2008, submitted — Matthew J. Harrigan, Jr.

52. Additional Ultracool White Dwarfs Found in the Sloan Digital Sky Survey. ApJ. 2008, 679, 697-703 — Hugh C. Harris arXiv:0804.3810

53. SWIRE/SDSS quasars (Hatziminaoglou+, 2008). VizieR On-line Data Catalog: J/MNRAS/386/1252. Originally published in: 2008MNRAS.386.1252H — E. Hatziminaoglou

54. Properties of dusty tori in active galactic nuclei - I. The case of SWIRE/SDSS quasars. MNRAS 2008, 386, 1252-1264 — E. Hatziminaoglou arXiv:0802.2458

55. Effects of the interaction between dark energy and dark matter on cosmological parameters. Journal of Cosmology and Astroparticle Physics 2008, Issue 6, pp. 010 — Jian-Hua He arXiv:0801.4233

56. Current star formation in early-type galaxies and the K+A phenomenon. MNRAS 2008, 387, 1537-1553 — J.-F. Helmboldt

57. Radio Detection of Radio-Quiet Galaxies. AJ 2008, accepted — J. A. Hodge

58. Precise estimates of the synthetic spectral distances to DA white dwarfs. AJ 2008, 135, 1239-1248 — J. B. Holberg

59. The rate of type Ia supernovae at z~0.2 from SDSS-I overlapping fields. MNRAS 2008, submitted — Assaf Horesh

60. The Milky Way tomography with SDSS: II. Stellar metallicity. ApJ 2008, accepted — Zelijko Ivezic

61. A sample of quasars with strong nitrogen emission lines from the Sloan Digital Sky Survey. ApJ 2008, 679, 962-966 — Linhua Jiang arXiv:0802.4234

62. New constraints on the efficiencies of ram pressure stripping and the tidal disruption of satellite galaxies. ApJ Letters 2008, 676, L101-L104 — X. Kang arXiv:0801.1843

63. The coincidence problem and interacting holographic dark energy. Journal of Cosmology and Astroparticle Physics 2008, Issue 05, pp. 011 — Khamphee Karwan arXiv:0801.1755

64. The Size Function of Galaxy Disks out to z ~ 1 from the Canada-France-Hawaii-Telescope Legacy Survey. ApJ 2008, accepted — Anudeep Kanwar

65. Observational Constraints on the Dependence of Radio-Quiet Quasar X-Ray Emission on Black Hole Mass and Accretion Rate. ApJ Supplement Series 2008, 176, 355-373 —

Brandon C. Kelly arXiv:0801.2383

66. Constraining quasar host halo masses with the strength of nearby Lyα forest absorption. MNRAS 2008, 387, 377-386 — Young-Rae Kim

67. The intrinsic fraction of broad-absorption line quasars. MNRAS 2008, 386, 1426-1435 — Christian Knigge arXiv:0802.3697

68. 2MASS, SDSS and FIRST fluxes of QSOs (Labita+, 2008). VizieR On-line Data Catalog: J/MNRAS/383/1513. Originally published in: 2008MNRAS.383.1513L — M. Labita

69. Interactions, star formation and AGN activity. MNRAS 2008, 385, 1915-1922 — Cheng Li arXiv:0712.0383

70. Interaction-induced star formation in a complete sample of 10^5 nearby star-forming galaxies. MNRAS 2008, 385, 1903-1914 — Cheng Li arXiv:0711.3792

71. Overcoming the Circular Problem for Gamma-Ray Bursts in Cosmological Global-Fitting Analysis. ApJ 2008, 680, 92-99 — Hong Li arXiv:0711.1792

72. Probing for cosmological parameters with LAMOST measurement. arXiv:0806.1842— Hong Li

73. CasJobs and MyDB: A Batch Query Workbench. Computing in Science and Engineering 2008, 10, 18-29 — N. Li

74. Age-metallicity relation via photometry (Li+, 2008). VizieR On-line Data Catalog: J/MNRAS/385/1270. Originally published in: 2008MNRAS.385.1270L — Z. Li

75. Galaxy Zoo : Morphologies derived from visual inspection of galaxies from the Sloan Digital Sky Survey. MNRAS 2008, submitted — Chris J. Lintott

76. Metallicities and Physical Conditions in Star-forming Galaxies at z ~ 1.0-1.5. ApJ 2008, 678, 758-779 — Xin Liu arXiv:0801.1670

77. Galaxy Clusters in the Line of Sight to Background Quasars. I. Survey Design and Incidence of Mg II Absorbers at Cluster Redshifts. ApJ 2008, 679, 1144-1161 — S. Lopez arXiv:0803.0598

78. Galaxy Merger Morphologies and Time-Scales from Simulations of Equal-Mass Gas-Rich Disc Mergers. MNRAS 2008, submitted — Jennifer M. Lotz

79. Constraints on modified Chaplygin gas from recent observations and a comparison of its status with other models. Phys Letters B 2008, 662, 87-91 — Jianbo Lu

80. Measuring Stellar Radial Velocities with a Dispersed Fixed-Delay Interferometer. ApJ 2008, 678, 1505-1510 — Suvrath Mahadevan arXiv:0801.3959

81. Precision photometric redshift calibration for galaxy-galaxy weak lensing. MNRAS 2008, 386, 781-806 — R. Mandelbaum arXiv:0709.1692

82. Halo mass - concentration relation from weak lensing. JCAP 2008, accepted — Rachel Mandelbaum

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85. The Growth of Luminous Red Galaxies by Merging. ApJ 2008, 679, 260-268 — Morad Masjedi arXiv:0708.3240

86. Lensing, reddening and extinction effects of MgII absorbers from z = 0.4 to 2. MNRAS 2008, 385, 1053-1066 — Brice Menard arXiv:0706.0898

87. The VIMOS-VLT Deep Survey: Dependence of galaxy clustering on stellar mass. arXiv:0805.2319 — B. Meneux

88. A Cross-Match of 2MASS and SDSS: Newly Found L and T Dwarfs and an Estimate of the Space Density of T Dwarfs. ApJ 2008, 676, 1281-1306 — Stanimir A. Metchev arXiv:0710.4157

89. The mass-metallicity relation of interacting galaxies. MNRAS Letters 2008, 386, L82-L86 — Leo Michel-Dansac arXiv:0802.3904

90. The SDSS DR6 Luminosity Functions of Galaxies. MNRAS 2008, submitted — Antonio D. Montero-Dorta arXiv:0806.4930

91. Quasar Clustering at 25 h^{-1} kpc from a Complete Sample of Binaries. ApJ 2008, 678, 635-646 — Adam D. Myers arXiv:0709.3474

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93. Large-Scale Anisotropic Correlation Function of SDSS Luminous Red Galaxies. ApJ 2008, 676, 889-898 — Teppei Okumura arXiv:0711.3640

94. Evolution of environment dependent galaxy properties in the Sloan Digital Sky Survey. MNRAS 2008, accepted — Ana Laura O'Mill

95. Can Supermassive Black Holes Form in Metal-Enriched High-Redshift Protogalaxies? ApJ 2008, in press — K. Omukai

96. Exploring star formation using the filaments in the Sloan Digital Sky Survey Data Release Five. MNRAS 2008, 387, 767-771 — Biswajit Pandey arXiv:0804.0072

97. The Cosmic Evolution of Metallicity from the SDSS Fossil Record. MNRAS 2008, submitted — Benjamin Panter

98. Angular momentum-Large-scale structure alignments in LCDM models and the SDSS. MNRAS 2008, submitted — Dante Paz

99. Outliers from the Mass--Metallicity Relation I: A Sample of Metal-Rich Dwarf Galaxies from SDSS. ApJ 2008, accepted — Molly S. Peeples

100. A Large Sample of BL Lac Objects from the SDSS and First. AJ 2008, 135, 2453-2469 — Richard M. Plotkin arXiv:0803.4219

101. Initial Conditions for Large Cosmological Simulations. ApJ Supplement Series 2008, submitted — S. Prunet

102. The Lopsidedness of Present-Day Galaxies: Results from the Sloan Digital Sky Survey. ApJ 2008, 677, 186-200 — Timothy A. Reichard arXiv:0710.0589

103. SDSS-Spitzer type I QSOs IR photometry (Richards+, 2006). VizieR On-line Data Catalog: J/ApJS/166/470. Originally published in: 2006ApJS..166..470R — G. T. Richards

104. Spectroscopic Determination of the Luminosity Function in the Galaxy Clusters A2199 and Virgo. AJ 2008, 135, 1837-1848 — Kenneth Rines arXiv:0710.1082

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106. Taxonomy of asteroid families among the Jupiter Trojans: comparison between spectroscopic data and the Sloan Digital Sky Survey colors. Astronomy and Astrophysics 2008, 483, 911-931 — F. Roig arXiv:0712.0046

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108. The L_X-M relation of clusters of galaxies. MNRAS Letters 2008, 387, L28-L32 — E. S. Rykoff arXiv:0802.1069

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