The Results of the Cycle 14 Peer Review

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The observations approved for *Chandra*'s 14th observing cycle are now in full swing and the Cycle 15 Call for Proposals (CfP) was released on 13 December 2012. Cycle 13 observations are nearly complete.

The Cycle 14 observing and research program was selected as usual, following the recommendations of the peer review panels. The peer review was held 25–29 June 2012 at the Hilton Boston Logan Airport, a week later than usual due to the lateness of the summer AAS meeting. More than 100 reviewers from all over the world attended the review, sitting on 15 panels to discuss 672 submitted proposals (Figure 1). The Target Lists and Schedules area of our website provides lists of the various types of approved programs, including abstracts. The peer review panel organization is shown in Table 1.

The Cycle 14 CfP included a second call for X-ray Visionary Projects (XVPs). XVPs are major, coherent science programs to address key, high-impact scientific questions in current astrophysics that require 1-6 Ms of observing time. As in Cycle 13, the evolution of *Chandra*'s orbit results in a larger amount of available observing time as a lower fraction of each orbit is spent within the radiation belts. This allowed observing time to be allocated to XVPs without impacting the time available for GO proposals and Large Projects (LPs). The total amount of time allocated in Cycle 14 was 23.3 Ms, including 6.2 Ms awarded to 4 XVPs and 5.7 Ms to 12 LPs. The response to the XVP opportunity continued to be very positive. The oversubscriptions in telescope time for LPs and XVPs were 6.6 and 6.7 respectively. The overall oversubscription in observing time was 5.3 (Figure 2), typical of the past few cycles despite the much larger amount of time being allocated (Figure 3). The continued evolution of the *Chandra* orbit has allowed us to include a smaller (5 Ms) XVP program in the Cycle 15 CfP.

Following our standard procedure, all proposals were reviewed and graded by the topical panels, based primarily upon their scientific merit, across all proposal types. Each topical panel received an initial allocation of *Chandra* time for GO observing proposals

Table 1: Panel Organization

Topical Panels:	
<u>Galactic</u>	
Panels 1,2	Normal Stars, WD, Planetary Systems and Misc
Panels 3,4	SN, SNR + Isolated NS
Panels 5,6,7	WD Binaries + CVs, BH and NS Binaries, Galaxies: Populations
<u>Extragalactic</u>	
Panels 8,9,10	Galaxies: Diffuse Emission, Clusters of Galaxies
Panels 11,12,13	AGN, Extragalactic Surveys
XVP Panel	X-ray Visionary Proposals
Big Project Panel	LP and XVP Proposals

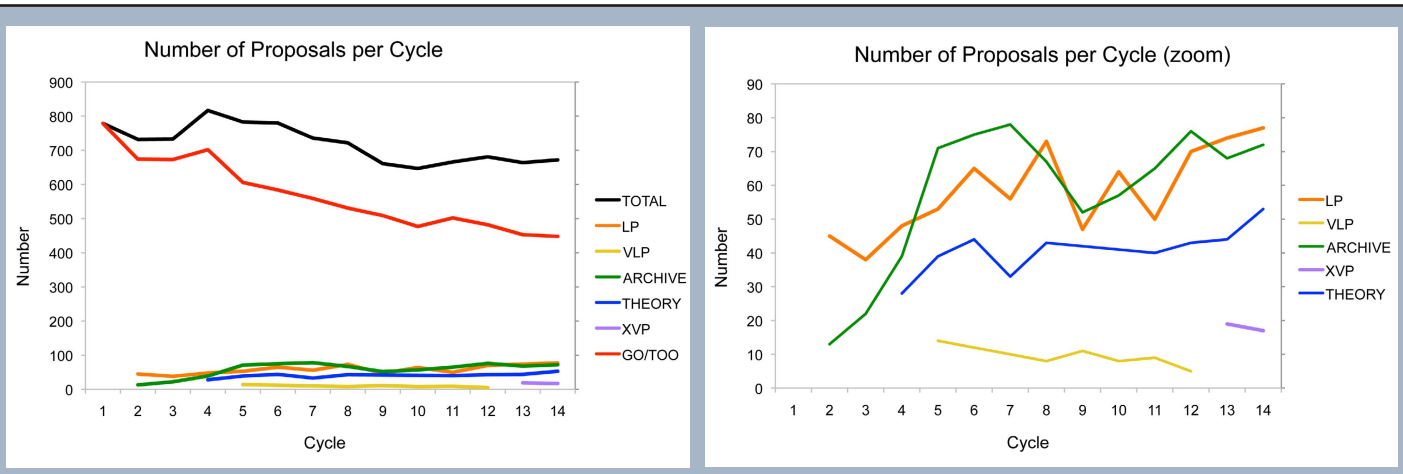

Fig. 1 - a: The number of proposals submitted in each proposal category (e.g. GO, LP, Archive etc.) as a function of cycle., b: zoom on lower curves. Since more proposal types have become available in each cycle, the number classified as GO has decreased as other types increase. The total number of submitted proposals has been remarkably constant over the past 7-8 cycles.

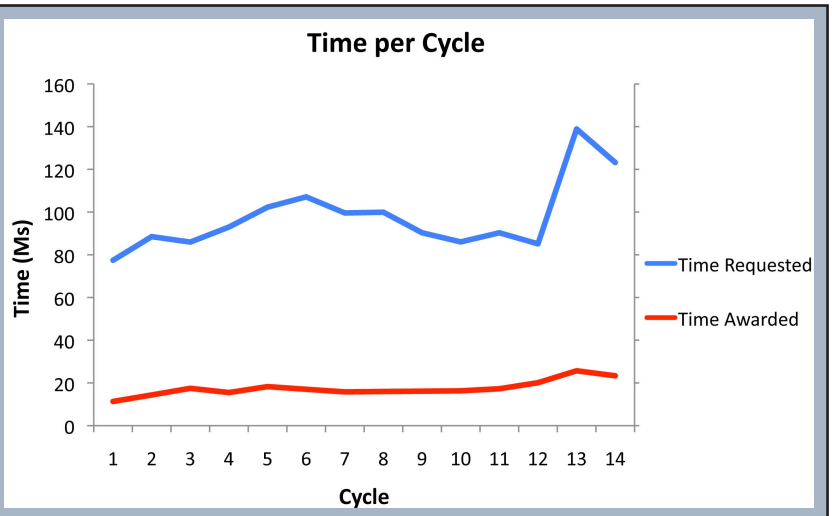

Fig. 2 - The requested and approved time in Ms as a function of cycle, including allowance for the probability of triggering each TOO. The requested time increased somewhat over the first few cycles, the largest effect being due to the introduction of Very Large Projects (VLPs) in Cycle 5. The subsequent increase in requested and awarded time in Cycles 13 and 14 is clear.

based upon the demand for time in that panel. Other allocations to each panel included: joint time, TOOs with a < 30 day response, time constrained observations in each of 3 classes, time in future cycles and money to fund archive and theory proposals. These were based on the full peer review oversubscription ratio. The topical panels produced a rank-ordered list along with detailed recommendations for individual proposals where relevant. A report was drafted for each proposal by one/two members of a panel and reviewed by the deputy panel chair before being delivered to the CXC. Panel allocations were modified, either in real time during the review or after its completion, to transfer unused allocations between panels so as to follow the panel recommendations as far as possible.

LPs and XVPs were discussed by the topical panels and ranked along with the GO, archive and theory proposals. In addition, the XVPs were discussed and ranked by a separate XVP/pundit panel. The topical and XVP panels' recommendations were recorded and passed to the Big Project Panel (BPP), which included all topical panel chairs and members of the XVP panel. The schedule for the BPP at the review included time for reading and for meeting with appropriate panel members to allow coordination for each subject area. The BPP discussed the LPs and XVPs separately and generated two rank-ordered lists. The meeting extended into Friday afternoon to allow for additional discussion and a consensus on the final rank-ordered lists to be reached. A small amount of observing time was transferred between the two lists during these final deliberations to ensure that all observing time was allocated. BPP panelists updated review reports, both at the review and remotely over the following 2 weeks, to include the BPP discussion.

The resulting observing and research program for Cycle 14 was posted on the CXC website on 20 July 2012, following detailed checks by CXC staff and approval by the Selection Official (CXC Director). All peer review reports were reviewed by CXC staff for clarity and consistency with the recommended target list. Formal e-letters informing the PIs of the results, providing budget information (when appropriate) and providing a report from the peer review, were e-mailed to each PI in early August.

Joint Time Allocation

Chandra time was also allocated to several joint programs by the proposal review processes of *XMM-Newton* (2 proposals) and HST (3 proposals).

The *Chandra* review accepted joint proposals with time allocated on: *Hubble* (12), *XMM-Newton* (2), NRAO (14), and NOAO (3).

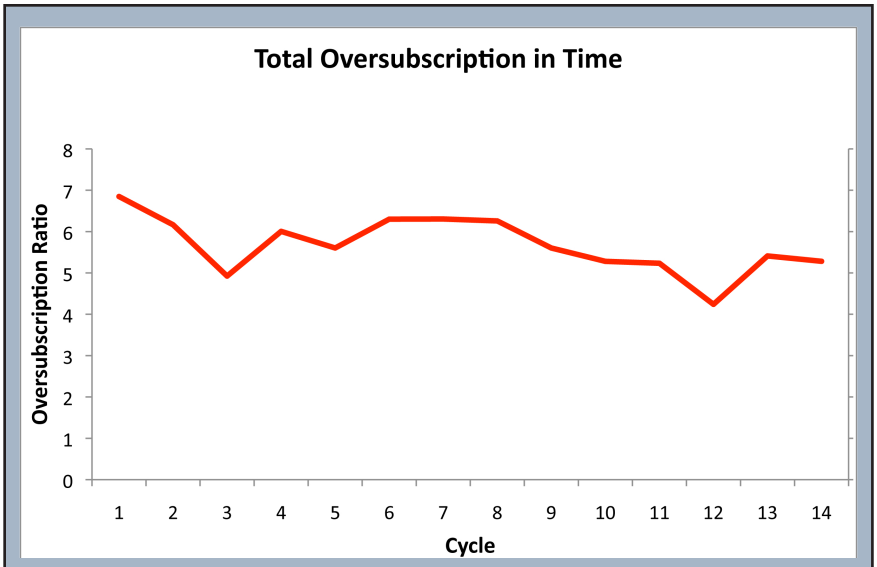

Fig. 3 - The final oversubscription in observing time based on requested and allocated time in each cycle. Again the numbers are remarkably constant. The decrease in Cycle 12 reflects the late 16% increase in the amount of time awarded by the peer review in that cycle to offset the significantly increasing observing efficiency as the orbit evolved (Wilkes, B. 2011, Chandra News, 18, 38).

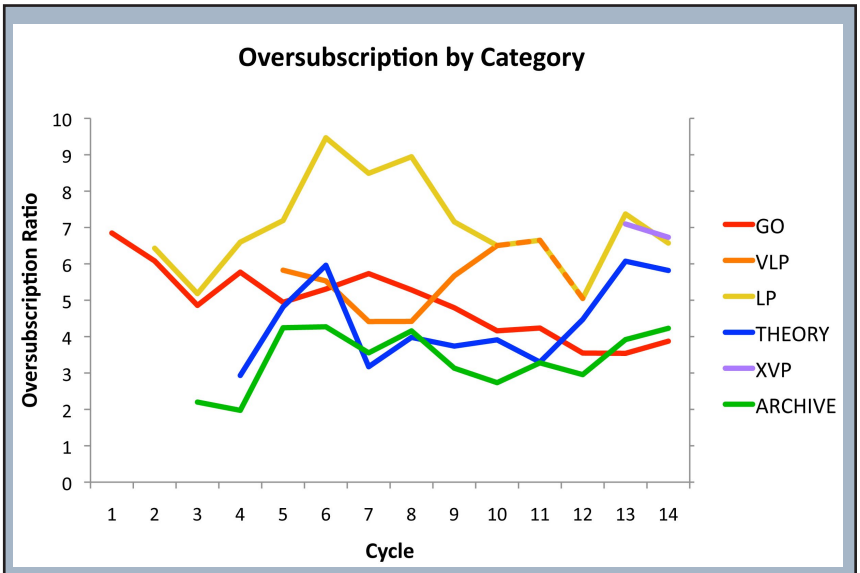

Fig. 4 - The effective oversubscription ratio in terms of observing time for each proposal category as a function of cycle. Oversubscription for Archive and Theory categories is shown by funding. Please note that some of the fluctuations are due to small number statistics (e.g. Theory proposals).

Constrained Observations

As observers are aware, the biggest challenge to efficient scheduling of *Chandra* observations is in regulating the temperature of the various satellite components (see POG Section 3.3.3). In Cycle 9 we instituted a classification scheme for constrained observations which accounts for the difficulty of scheduling a given observation (CfP Section 5.2.8). Each class was allocated an annual quota based on our experience in previous cycles. The same classification scheme was used in Cycles 10-14. In Cycles 13 and 14 the quotas were increased commensurate with the larger amount of observing time to be awarded. There was a large demand for constrained time so that not all proposals which requested time-constrained observations and had a passing rank (>3.5) could be approved. Effort was made to ensure that the limited number of constrained observations were allocated to the proposals ranked highest, review-wide. Detailed discussions were carried out with panel chairs to record the priorities of their panels in the event that more constrained observations could be allocated. Any uncertainty concerning priorities encountered during the final decision process was discussed with the relevant panel chairs before the recommended target list was finalized.

Please note that the most over-subscribed constraint class was: "EASY" while "AVERAGE" was only marginally oversubscribed. In practice, these two classes were combined when determining which observations should be allocated time. The same 3 classes will be retained in Cycle 15 so as to ensure a broad distribution in the requested constraints. *We urge proposers to specify their constraints as needed by the science.*

Cost Proposals

PIs of proposals with US collaborators were invited to submit a Cost Proposal, due in Sept 2012 at SAO. In Cycle 14 each project was allocated a budget based on the details of the observing program (see CfP Section 8.4). Awards were made at the allocated or requested budget levels, whichever was lower. The award letters were e-mailed in late November, in good time for the official start of Cycle 14 on 1 Jan 2013.

Proposal Statistics

Statistics on the results of the peer review can be found on our website: under "Target Lists and Schedules" select the "Statistics" link for a given cycle. We present a subset of those statistics here. Figure 4 displays the effective oversubscription rate for each proposal type as a function of cycle. Figures 5, 6 show the percentage of time allocated to each science

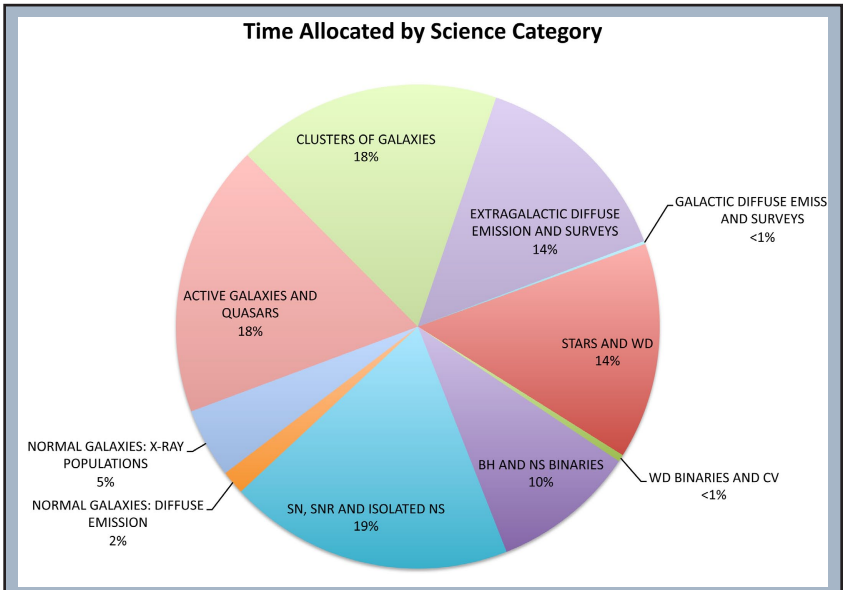

Fig. 5 - A pie chart indicating the percentage of *Chandra* time allocated in each science category. Note that the time available for each category is determined by the demand.

category and to each instrument combination. Table 2 lists the numbers of proposals submitted and approved, per country of origin.

Table 2: Number of Requested and Approved Proposals by Country

Country	Requested		Approved	
	# Proposals	Time (ks)	# Proposals	Time (ks)
USA	512	94577.7	151	21097.8
Foreign	160	31378.2	34	3714.00
Country	Requested		Approved	
	# Proposals	Time (ks)	# Proposals	Time (ks)
Argentina		90.00		
Australia	4	795.00		
Austria	1	30.00	1	30.00
Belgium	3	1010.00		
Bulgaria	2	205.00		
Canada	14	1748.00	5	330.00
Chile	1	283.00		
China	1	50.00		
Finland	1	22.00		
France	4	2360.00	2	180.00
Germany	33	8289.00	3	306.00
India	6	555.00		
Ireland	2	35.00		
Israel	2	325.00		
Italy	22	4124.00	5	722.00
Japan	6	679.00	2	145.00
Korea	1	198.10		
Mexico	1	170.00	1	170.00
Netherlands	10	1037.00	4	431.00
Russia	1	105.00		
Spain	9	611.00	2	115.00
Switzerland	1	30.00		
Taiwan	2	307.00		
Turkey	4	397.00		
U.K.	28	7923.10	9	1285.00

* Note: Numbers quoted here do not allow for the probability of triggering TOOs

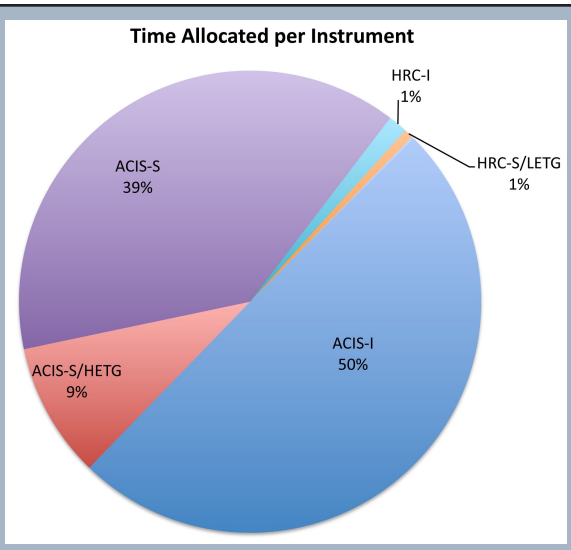

Fig. 6 - A pie chart showing the percentage of *Chandra* time allocated to observations for each instrument configuration.