Cycle 15 Peer Review Results

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The observations approved for *Chandra*'s 15th observing cycle are now in full swing and the Cycle 16 Call for Proposals (CfP) was released on 12 December 2013. Cycle 14 observations are close to completion.

The Cycle 15 observing and research program was selected as usual, following the recommendations of the peer review panels. The peer review was held 18–21 June 2013 at the Hilton Boston Logan Airport. It was attended by 110 reviewers from all over the world, who sat on 15 panels to discuss the 636 submitted proposals (Fig. 1). The "Target Lists and Schedules" link of our website (http://cxc.harvard.edu/target_lists/) provides access to lists of the various approved programs, including abstracts. The peer review panel organization is shown in Table 1.

The Cycle 15 CfP included a third call for X-ray Visionary Projects (XVPs). XVPs are major, coherent science programs to address key, high-impact scientific questions in current astrophysics. The amount of time available for XVPs was reduced to 5 Ms this cycle. The continuing, expected evolution of *Chandra*'s orbit is decreasing the amount of "additional" available observing time, because the fraction of each orbit spent within the radiation belts is increasing. The total amount of time allocated in Cycle 15 was 20 Ms, including 5 Ms awarded to 2 XVPs and 3.6 Ms to 8 LPs. The response to the XVP opportunity continued to be very strong, with over-subscriptions in telescope time for LPs and XVPs of 8.8 and 6.4 respectively. The overall over-subscription in observing time was 5.3 (Fig. 2), typical of the past few cycles despite the larger amount of time being requested and allocated (Fig. 3). As the continued evolution of the *Chandra* orbit brings it back to a more typical configuration, the smaller amounts of excess time in Cycles 16, 17 are being combined to provide a pool of 5 Ms which will be allocated in Cycle 16 and observed over both cycles. There will be no XVP call in Cycle 17.

Topical Panels:	
Galactic	
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
Extragalactic	
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

Table 1: Panel Organization

Following our standard procedure, all proposals were reviewed and graded by the topical panels, based primarily upon their scientific merit, across all proposal types. The topical panels were allotted *Chandra* time to cover the allocation of time for GO observing proposals based upon the demand for time in each panel. Other allocations made to each panel included: joint

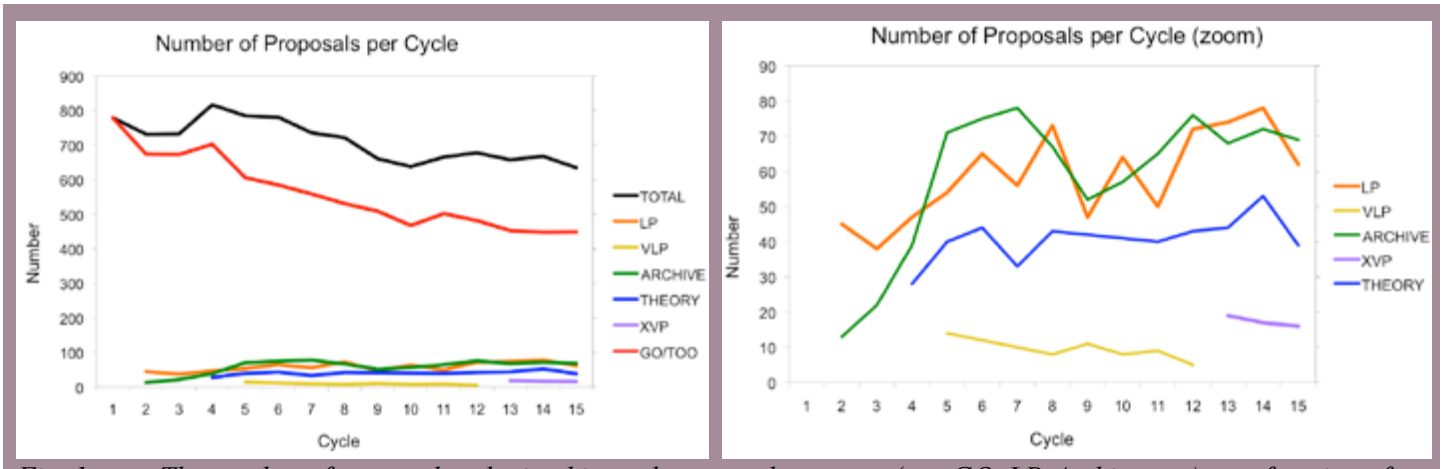

Fig. 1 — a: The number of proposals submitted in each proposal category (e.g. GO, LP, Archive etc.) as a function of cycle, b: zoom on lower curves. Since more proposal categories have become available in each cycle, the number classified as GO has decreased as others increased. The total number of submitted proposals has been remarkably constant over the past 8-9 cycles.

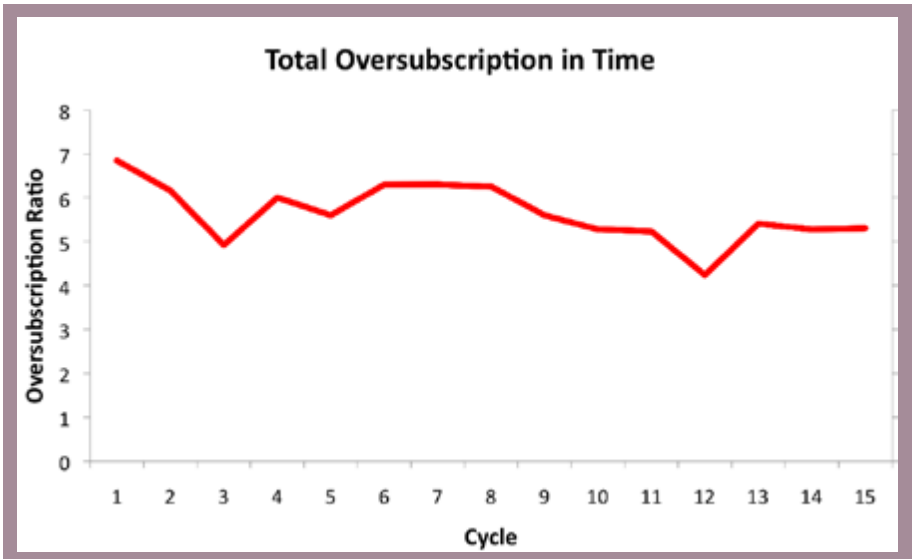

Fig. 2 — The final over-subscription in observing time based on requested and allocated time in each cycle. The numbers are remarkably constant. The decrease in Cycle 12 reflects the late, 16% increase in the amount of time awarded by the peer review in that cycle to offset the significantly increased observing efficiency as the orbit evolved (see article in 2011 Newsletter).

time, TOOs with a < 30 day response, time constrained observations in each of 3 constraint classes, time in future cycles, constrained observations in future cycles, and money to fund archive and theory proposals. These allocations were based on the full peer review over-subscription 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 the appropriate topical review panel and reviewed by the Deputy panel chair before being delivered to the CXC. Panel allocations were modified, either during the review or in some cases after its completion, to transfer unused allocations between panels so as to follow the review recommendations as closely 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 proposal lists. The meeting extended into Friday afternoon to allow for additional discussion, for a consensus on the final rank-ordered lists to be reached, and to ensure that all observing time was allocated. At least 2 BPP panelists updated each review report to include any BPP discussion, at the review and/or remotely over the following week.

The resulting observing and research program for Cycle 15 was posted on the CXC website on 12 July 2013, 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. Budget allocations were determined for proposals which included US-based investigators. Formal e-letters informing the PIs of the results, budget information (when appropriate) and providing the report from the peer review, were e-mailed to each PI in August.

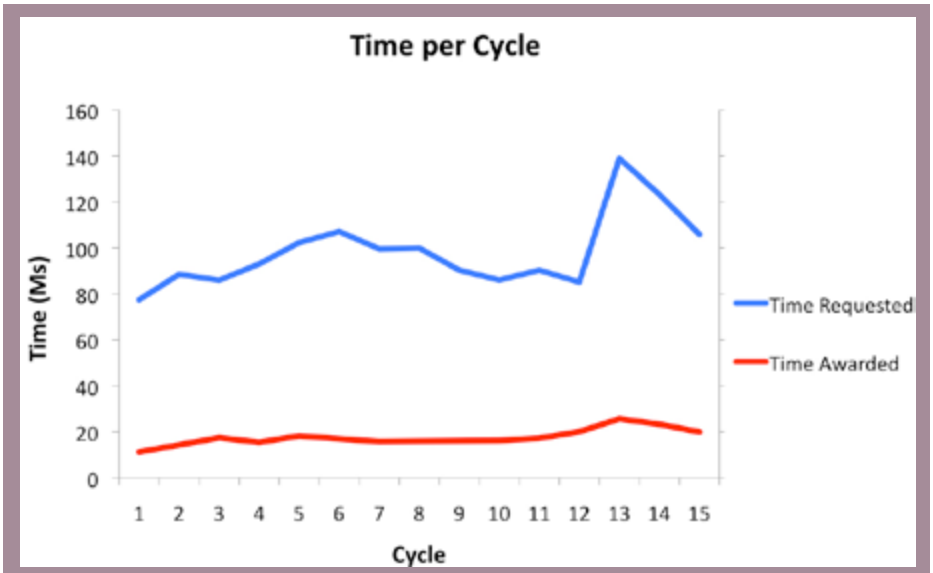

Fig. 3 — The requested and approved time as a function of cycle in Ms including allowance for the probability of triggering each TOO. The available time increased over the first 3 cycles, and in Cycle 5 with the introduction of Very Large Projects (VLPs). The subsequent increase in time to be awarded due to the increasing observing efficiency and the corresponding increase in requested time in response to the calls for X-ray Visionary Projects (XVPs) in Cycles 13-15 is clear.

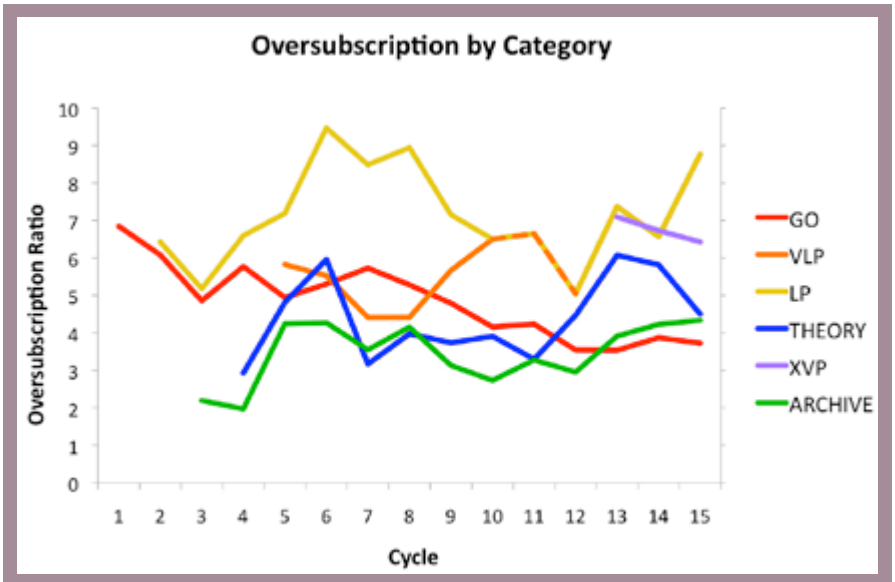

Fig. 4 — The effective over-subscription ratio in terms of observing time for each proposal category as a function of cycle. Note that some of the fluctuations are due to small number statistics (e.g. Theory proposals).

Joint Time Allocation

Chandra time was also allocated to several joint programs by the proposal review processes of *XMM-Newton* (1 proposal), Spitzer (1 proposal), and HST (1 proposal). The *Chandra* review accepted joint proposals with time allocated on: Hubble (11), *XMM-Newton* (4), Swift (3), NRAO (13), and NOAO (2).

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, and the ACIS article in this Newsletter). 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 constraint class was allocated an annual quota based on our experience in previous cycles. The same classification scheme was used in Cycles 10-15. In Cycles 13-15 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 highest-ranked proposals 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 over-subscribed. In practice these two classes were combined when determining which observations should be allocated time. The same 3 classes will be retained in Cycle 16 so as to ensure a broad distribution in the requested contraints. *We urge proposers to request the class of constraint required to achieve the science goals.*

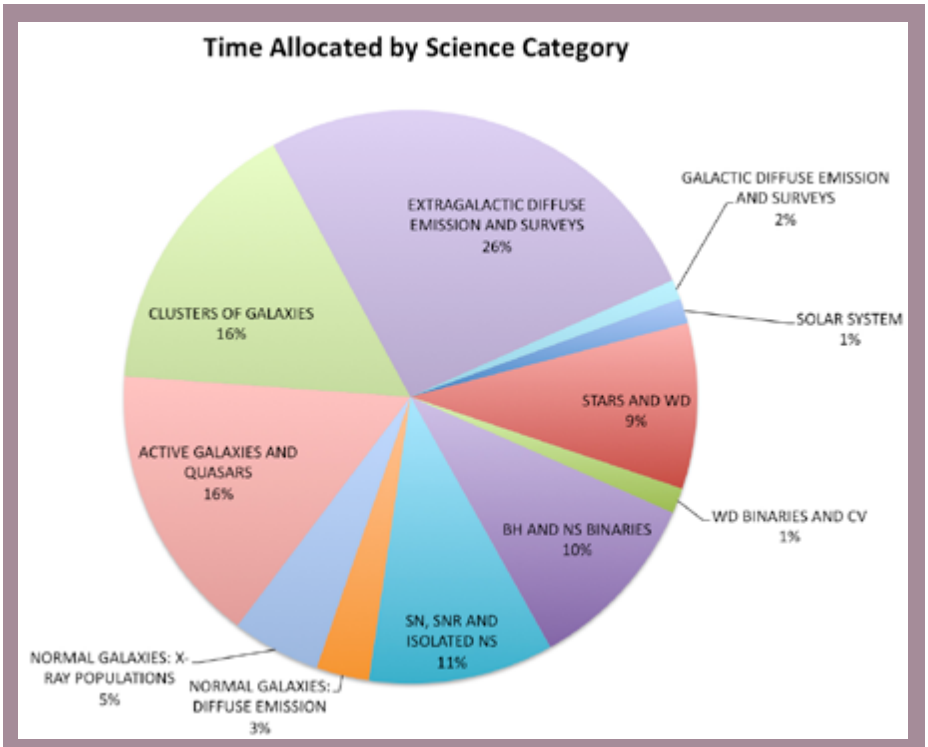

Fig. 5 — A pie chart indicating the percentage of Chandra *time allocated in each science category. Note that the time available for each science category is determined by the demand.*

Cost Proposals

PIs of proposals with US collaborators were invited to submit a Cost Proposal, due Sept 2013 at SAO. In Cycle 15 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 emailed in late November, in good time for the official start of Cycle 15 on 1 Jan 2014.

Given the uncertainty in the FY14 Federal (and thus NASA) budget, Cycle 15 award letters included notification that award amounts may be reduced if sequestration or other cuts are made to the NASA *Chandra* budget. All *Chandra* awards are initially being funded at 50% of the final award amount, with the remaining 50% to be issued in March now that the FY14 budget level has been confirmed.

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. Fig. 4 displays the effective over-subscription rate for each proposal type as a function of cycle. Fig. 5 and 6 show the percentage of time allocated to each science category and to each instrument combination. Table 2 lists the numbers of proposals submitted and approved per country of origin.

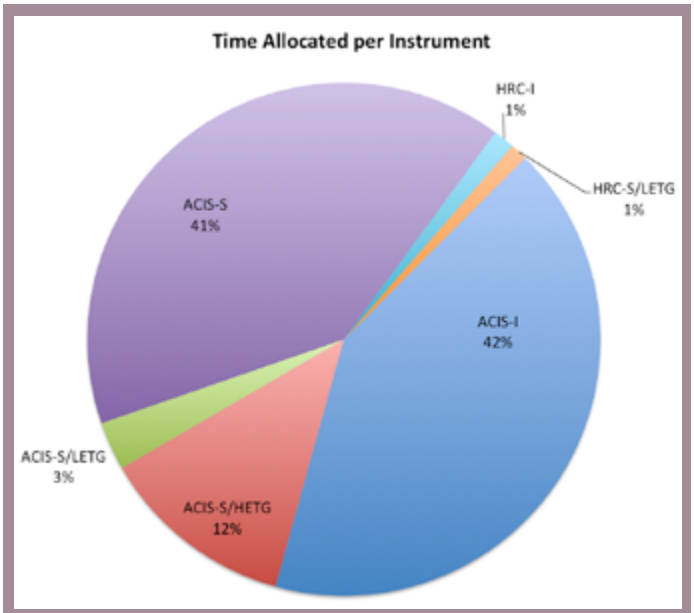

Fig. 6 — A pie chart showing the percentage of Chandra *time allocated to observations for each instrument configuration.*

Table 2: Number of Requested and Approved Proposals by Country

Country	Requested		Approved	
	# Proposals	Time (ks)	# Proposals	Time (ks)
USA	479	84309	137	17464
Foreign	157	24810	42	4315
Country	Requested		Approved	
	# Proposals	Time (ks)	# Proposals	Time (ks)
Australia	1	40	1	40
Belgium	1	350		
Bulgaria	1	139		
Canada	10	1405	2	195
Chile	2	230	1	190
China	2	185		
France	8	767	4	376
Germany	31	3453	8	1335
Greece	4	570	1	50
India	5	356	4	316
Ireland	1	21		
Israel	2	120	1	60
Italy	28	6985	7	651
Japan	12	1550	2	64
Korea	1	30		
Netherlands	11	1067	2	73
Poland	1	40		
Russia	2	42		
Slovakia	1	216		
Spain	6	960	2	165
Switzerland	2	530	1	250
Taiwan	5	340		
Turkey	1	20		
U.K.	19	5395	6	550

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