

Cycle 16 Peer Review Results

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The observations approved for *Chandra*'s 16th observing cycle are now underway and the Cycle 17 Call for Proposals (CfP) was released on 16 December 2014. Cycle 15 observations are close to completion.

The Cycle 16 observing and research program was selected, as usual, following the recommendations of the peer review panels. The peer review was held 23–27 June 2014 at the Hilton Boston Logan Airport. It was attended by 104 reviewers from all over the world, who sat on 15 panels to discuss the 635 submitted proposals (Fig. 1). The “Target Lists and Schedules” page of our website (http://cxc.harvard.edu/target_lists/index.html) provides access to lists of the various approved programs, including abstracts. The peer review panel organization is shown in Table 1.

The Cycle 16 CfP included a fourth call for X-ray Visionary Projects (XVPs). XVPs are major, coherent science programs to address key, high-impact scientific questions in current astrophysics. In Cycles 13–15, the evolution of *Chandra*'s orbit resulted in a larger amount of available observing time as a lower fraction of each orbit was spent within the radiation belts. This allowed observing time to be allocated to XVPs without impacting the time available for General Observing (GO) proposals and Large Projects (LPs). In Cycle 16, the orbit has evolved to a more typical configuration resulting in a smaller excess of time. The Cycle 16 XVP call was funded through combining time from Cycles 16 and 17, with no XVP call in Cycle 17. The amount of time available for XVPs was 5.5 Ms this cycle, including 2 Ms from Cycle 17.

The total amount of time allocated in Cycle 16 was 22 Ms, including 5.35 Ms awarded to 3 XVPs and 4 Ms to 9 LPs. The response to the XVP opportunity continued to be very strong with over-subscriptions in telescope time for LPs and XVPs of 8.1 and 5.1 respectively. The overall over-subscription in observing time was 4.8 (Fig. 2), typical of the past few cycles despite the larger amount of time being requested and allocated (Fig. 3).

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 observ-

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

ing proposals based upon the demand for time in that panel. Other allocations made to each panel included: joint time, TOOs with a < 30 day response, time constrained observations in each of 3 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 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 review 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, 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 16 was posted on the CXC website on 18 July 2014, 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.

Joint Time Allocation

Chandra time was also allocated to joint programs by the proposal review processes of *XMM-Newton* (1 proposal) and HST (1 proposal).

The *Chandra* review accepted joint proposals with time allocated on: *Hubble* (15), *XMM-Newton* (1), *Suzaku* (1), NuSTAR (2), and NRAO (17).

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, http://cxc.harvard.edu/proposer/POG/html/chap3.html#tth_sEc3.3.3). In Cycle 9, we instituted a classification scheme for constrained observations which accounts for the diffi-

culty of scheduling a given observation (CfP Section 5.2.8, <http://cxc.harvard.edu/proposer/Cfp/Cfp.pdf>). Each class was allocated an annual quota based on our experience in previous cycles. The same classification scheme was used in Cycles 10–16. There was a large demand for constrained time so that not all proposals which requested time constrained observations and had a passing grade (> 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 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 17 so as to ensure a broad distribution in the requested constraints. *We urge proposers to request the class of constraint required to achieve the science goals.*

Cost Proposals

PIs of proposals with US collaborators were invited to submit a Cost Proposal, due in September 2014 at SAO. In Cycle 16, each project was allocated a budget based on the details of the observing program (see CfP Section 8.4). Awards were made at the

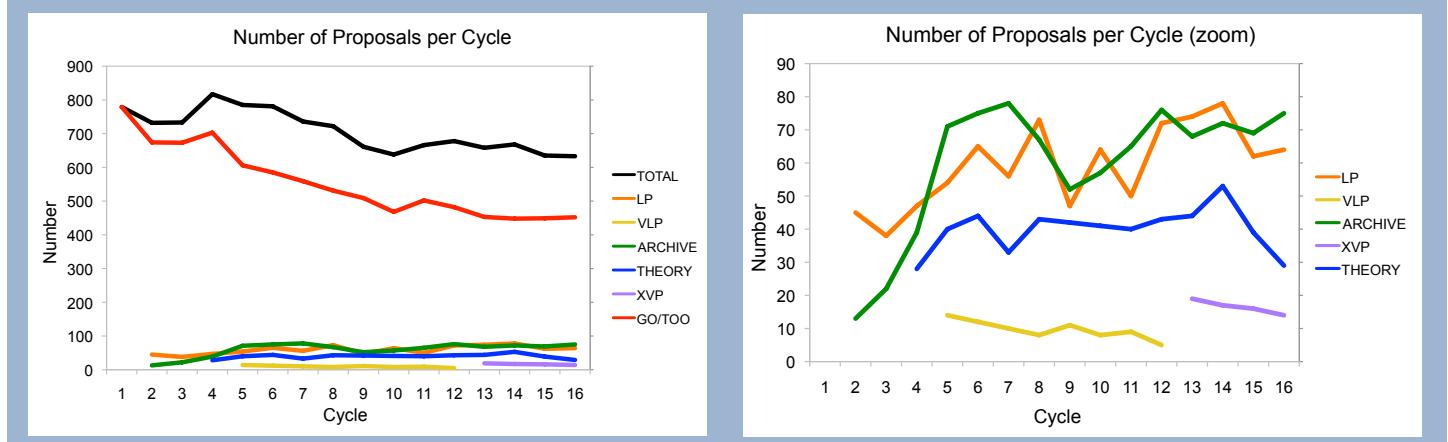


Fig. 1 — Left: The number of proposals submitted in each proposal category (e.g., GO, LP, Archive etc.) as a function of cycle. Right: zoom on lower curves. Since more proposal categories have become available in each cycle, the number classified as GO has decreased as others increased. The total number of submitted proposals has been remarkably constant over the 6 past cycles.

Spring, 2015



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 increasing observing efficiency as the orbit evolved (see article in 2011 Newsletter).

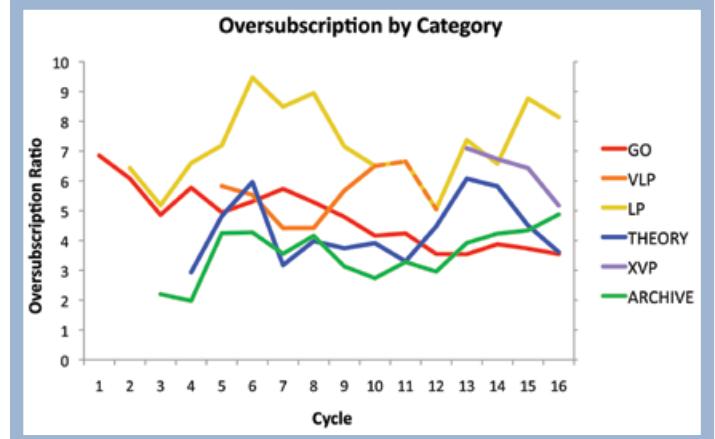


Fig. 4 — The effective oversubscription ratio in terms of observing time for each proposal category as a function of cycle. Note that some of the fluctuations are due to small number statistics (e.g. Theory proposals).

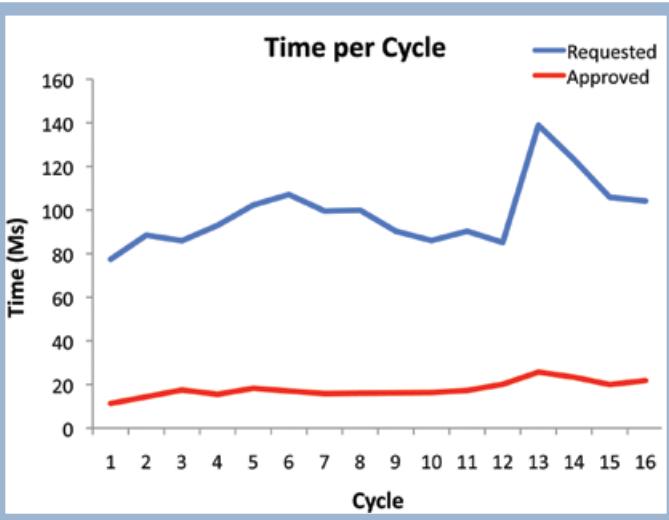


Fig. 3 — The requested and approved time as a function of cycle in Ms including allowance for the probability of triggering each TOO. The available time increased over the first 3 cycles, and in Cycle 5 with the introduction of Very Large Projects (VLPs). The subsequent increase in time to be awarded 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 13–16 is clear.

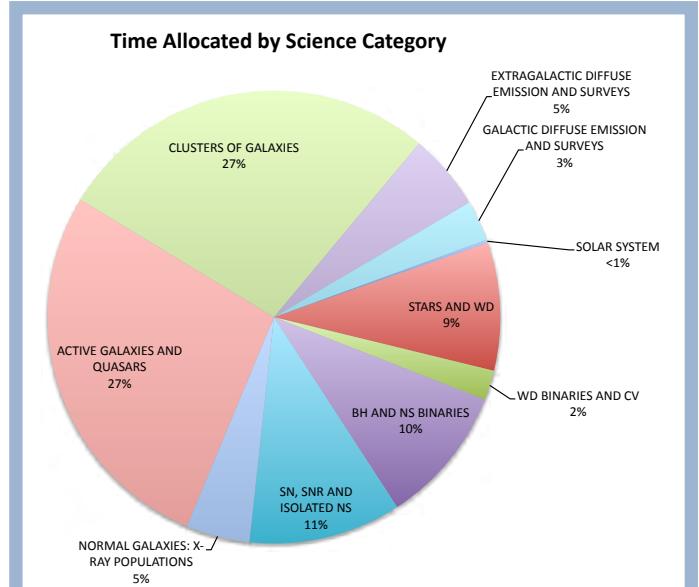


Fig. 5 — A pie chart indicating the percentage of Chandra time allocated in each science category. Note that the time available for each science category is determined by the demand.

allocated or requested budget levels, whichever was lower. The award letters were emailed in December, in time for the official start of Cycle 16 on 1 January 2015.

Proposal Statistics

Statistics on the results of the peer review for a given cycle can be found on our website (http://cxc.harvard.edu/target_lists/index.html). 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. Figs. 5, 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.

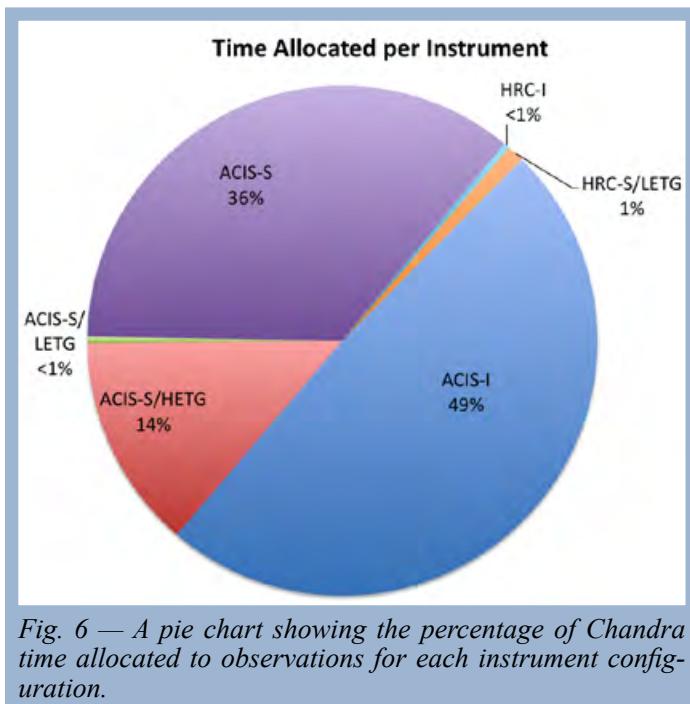


Fig. 6 — A pie chart showing the percentage of Chandra time allocated to observations for each instrument configuration.

Country	Requested		Approved	
	# Proposals	Time (ks)	# Proposals	Time (ks)
USA	476	74387.2	149	16930.4
Foreign	161	34140.7	43	6510

Country	Requested		Approved	
	# Proposals	Time (ks)	# Proposals	Time (ks)
Australia	1	40		
Belgium	1	350	1	350
Canada	10	817	2	175
Chile	1	140		
China	2	235		
Estonia	1	750		
Finland	1	137		
France	5	845	3	650
Germany	30	5294	12	1419
Greece	1	500		
India	3	280		
Israel	1	60		
Italy	32	8650	8	480
Japan	14	1288.7	3	90
Mexico	1	300		
Netherlands	10	3025	5	2440
Poland	1	40		
South Africa	1	115		
Spain	8	1781	3	235
Switzerland	7	1284	1	200
Taiwan	3	228	1	46
Turkey	1	60		
U.K.	26	7921	4	425

Table 2: Number of Requested and Approved Proposals by Country

* Note: Numbers quoted in Table 2 do not allow for the probability of triggering TOOs