ACIS

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The ACIS instrument continued to perform well over the past year, conducting the vast majority of observations with *Chandra*. There were no ACIS instrument anomalies that impacted science observing.

Thermal control of the ACIS focal plane and electronics boxes continues to be a significant issue, as does that of other subsystems on the spacecraft. One consequence of the thermal situation is continuing evolution in the misalignment between the Aspect Camera and X-ray telescope boresights. For a couple months in the fall of 2015, there was concern about our ability to place a target into a small (⅛ chip) subarray on ACIS. This has now been resolved in a way that is transparent to users, specifically, every two weeks we use the past pointing performance of the telescope to recompute the alignment matrix used by the spacecraft. This solution assures that a target will reside well within a region even as small as a small subarray on ACIS.

As in previous years, GOs are encouraged to designate chips not required for their science goals as optional (by selecting OFF1, OFF2, etc. on the RPS form) in the order in which the chips would be turned off if required for thermal reasons. Details are given in the Proposers' Observatory Guide (POG) and all users are urged to read the section on optional chips carefully.

The contamination layer continues to accumulate on the ACIS optical blocking filter. The presently released contamination calibration file (labeled N0009 in CALDB 4.6.2) in the Calibration Database does a good job of predicting the contamination in the centers of the chips. However, there is a suggestion from recent calibration observations of 1E1012-7219, Abell 1795, and Markarian 421 that the contaminant may be building up more rapidly near the edges of the blocking filter than the model predictions indicate. The *Chandra* Calibration article (pp. 35-36) discusses this in more detail The charge-transfer inefficiency (CTI) of the front-illuminated (FI) and back-illuminated (BI) CCDs is increasing at the expected rate.

In personnel matters, long-time ACIS team member Royce Buehler of MIT retired in January of 2016. Royce has been responsible for the software that generates and keeps track of the myriad of Science Instrument modes used in ACIS observations, in addition to other operations and analysis tasks. He will be missed, but we are fortunate to have had 20+ years of his attention, and more, on a part-time basis, in the next few years. Catherine Grant at MIT and John ZuHone at SAO have been brought into the operations team.

Several interesting and challenging observations were performed, for example those described in the cover article by Sebastian Heinz. Our colleagues at *Swift* were extremely helpful in monitoring bright and potentially flaring sources, to help ensure the safety of observations with *Chandra*.

A significant activity for the ACIS Operations team this year will be a review and expansion of Standard Operating Procedures (SOPs) to respond to potential instrument anomalies. In cooperation with the MIT instrument team, the existing SOPs have been reviewed and new SOPs recommended for development. For example, a new SOP monitors the checksum of the ACIS flight software, which is stored in an aging EEPROM memory chip. Although this information has been uncorrupted for sixteen years, there is no guarantee that a corruption will not occur. Another general SOP has been developed—and exercised in flight—to respond to cases of anomalous behavior from one video board or Front End Processor (FEP). This SOP suspends the current science run, dumps diagnostic information from that video board and FEP, and then resumes the science run with all CCDs except the affected one. ■