

Report on the First XUG meeting

The first meeting of the XRISM User's Group was held on July 17, 2025, via Zoom.

Attendees

Lia Corrales	Michela Negro
Keigo Fukumura	Frits Paerels
Rich Kelley	Robert Petre
Ralph Kraft	Paul Plucinsky
Peter Maksym	Eric Schlegel
Jon M. Miller (Chair)	Brian Williams
Koji Mukai	Irina Zhuravleva

Agenda

- 2:00 Quick introductions
- 2:10 Updates on the coming GO cycle, proposal pressure, etc. (Koji)
- 2:20 Updates on upcoming calibration efforts
- 2:30 Updates on the gate valve situation and future plans
- 2:40 Discussion of community involvement with XRISM

Summary of XUG Purview and Goals (Kelley, Petre)

At the start of this initial meeting, Rich Kelley and Rob Petre were asked to summarize the purview of the XUG (Brian Williams is nominally on paternity leave). The following is a brief summary of their statements:

The XUG is tasked with being the interface to the community. Information needs to flow both ways: the XUG needs to share information from the mission, and voice the concerns of the community to the mission. On some occasions - when the mission needs feedback to make an important choice - the XUG will be asked to provide inputs that represent the community. For instance, this will likely be the case for the matter of Key Projects. A particularly important function of the XUG is to help develop the mission science case for the NASA Senior Review of operating missions, and for mid-cycle reviews. In coordination with the mission, the XUG should summarize its meetings in reports that will be sent to NASA HQ and promptly shared on the mission website.

Summary of Proposals and Reviews (Mukai)

The XUG asked for an update on proposal pressure for Cycle 2 as a window on demand for the mission and the science that it delivers. This summary was provided by Koji Mukai. The key points for the community are as follows:

Although Cycle 2 is set to only run for six months for programmatic reasons, the raw oversubscription factor was 9.6. This is almost double the factor for Cycle 1 and likely indicates that the community has started to fully appreciate the potential of XRISM data, as papers from the PV phase have started to be published.

In total, for Cycle 2, 163 proposals were received requesting a raw total of 33.1 Ms of time. A total of 4 “type 2” proposals were received (these focus on laboratory astrophysics in support of XRISM science). The process of arranging panels and reviewing proposals is well underway, with the evaluation to take place in-person between August 11-13 in Baltimore, Maryland.

Updates on Calibration and Spacecraft Performance (Kelley)

The XUG requested an update on key spacecraft calibration and performance goals and issues. Rich Kelley was able to make extensive comments on these points. The following is a brief summary.

The most critical element of the mission calibration - the energy scale of the calorimeter - is in excellent shape. In the critical Fe K band, near to 6.4 keV, photon energies are registered to within 0.2 eV, or about 10 km/s. In the Si K band, close to 1.7 keV, energies are known to within 1 eV.

The background of the Resolve calorimeter may be the second most important matter. This has also been characterized extremely well already, and the background is found to be extremely low. Essentially, only a few non-source X-rays will be present in a spectrum per 5 eV bin per day. Only a small number of exposures are likely to be background-limited for line measurements.

Going forward, refinements will be made to the absolute effective area calibration, and the effective area at large off-axis angles. These are routine adjustments for all X-ray telescopes. Current uncertainties likely run at the level of 10%, though comparisons to NuSTAR are very encouraging. There is a remaining issue with the output of the signal processor, which reports a higher than physical number of low-resolution events; this is currently under study.

The spacecraft has operated extremely well, with no safe-holds.

Gate Valve Situation and Plans (Kelley)

The XUG requested a brief report on upcoming plans to open the gate valve, which is currently stuck in a “closed” position and truncates spectra below 1.6 keV. A detailed explanation was provided by Rich Kelley.

It is very likely that the gate valve is nearly open, and that the rollers that hold it in place are teetering on the edge of the door. This is deduced via several indirect means (current readouts

during the initial opening attempt, etc.). It is possible that the valve can be opened if the elements around it can be heated to become more pliable, and if the spacecraft can shake to some degree.

Three prior attempts have been made to open the gate valve, without success. In September, 2025, a series of more comprehensive attempts will be made. The area surrounding the gate valve will be warmed through maneuvers that achieve a specific solar aspect angle. All four vibration dampeners will be run in reverse to produce the greatest possible vibration. This procedure will be repeated, using different vibration patterns, throughout the month.

The greatest risk to the mission from this action is that the vibration could damage a Si filter that sits above the Resolve detector plane. No cracking or damage was observed in ground-testing with engineering models. This element is not held at low temperatures in orbit, so ground testing at room temperature is relevant.

Overall assessment of the XUG

XRISM is a new mission that delivers unique, groundbreaking science. Efforts to launch an X-ray calorimeter date back to the development of Astro-E in the 1990s. It has been remarkable to see the partnership between Japan, the US, and Europe grow and flourish.

The mission is now in its prime phase, making observations and delivering data to observers on schedule. The calibration, background, and spacecraft health are all excellent, with clear plans to monitor these key things in the future and to improve each of them.

We note that the cryogenic cooling fluid for Resolve is now expected to last until 2029, and that the mission can continue after 2029 with only a very small reduction to its observing efficiency (cooling of the detector plane will take slightly longer). For these reasons, it is reasonable to envision a mission that remains scientifically important for 10 or even 20 years.

Action items

There is a broad desire for the next meeting of the XUG to be in-person.

The XUG needs to reach out to members of the community, including via social media channels, in order to listen to concerns and relay them to the mission.

