

# XRISM

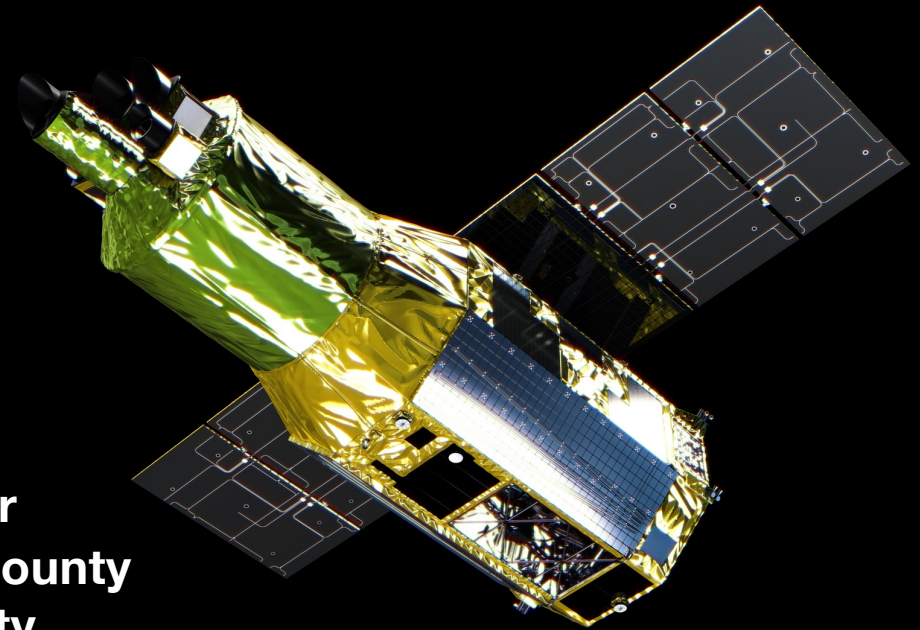
X-Ray Imaging and Spectroscopy Mission



**Cycle 2 Call for Proposals**

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## Previously on this Satellite

- ❑ Launch: 2023 September 6 (UT; September 7 Japanese time)
- ❑ Checkout & Initial Calibration: 2023 September through ~2024 January
- ❑ Performance Verification (PV) observations: 2023 December – 2024 August
  - PV data currently belong to the XRISM Science Team.
  - PV data are currently being analyzed , and papers are being prepared, submitted, and published.
  - PV data will be publicly released on 2025 August 31.
- ❑ Cycle 1 observations: **2024 September 1 – 2025 August 31** – so we're almost at the half-way point of the Cycle 1 period.
  - Real-time TOO requests for rare & unpredictable events are also considered.

The original intention was to issue annual call for proposals for each 12-month period.

# Gate Valve Operations

The Resolve aperture door ("Gate Valve") remains closed despite 3 attempts, making soft X-ray ( $E < 1.7$  keV) science beyond reach of Resolve, and reducing the effective area for hard X-rays. Required exposure times with the GV closed are roughly 1.5 times those with GV open even for Fe K line science.

All Cycle 1 observations will be carried out in the current, GV-closed, configuration.

If risks are deemed to be acceptably low, the next GV operation (GVO4) will be carried out following the conclusion of the Cycle 1 observations, in early 2025 September. There will be a **gap in routine observations** for the GV operation itself, and subsequent tests and calibrations.

The Cycle 2 proposal submission and agency-level review need to happen before the final decision is made, and the outcome of the potential GVO4 is known. Cycle 2 proposals **must assume the Gate Valve-closed configuration** for Resolve, and will be for a **6-month** period of observations, approximately **2025 November 1 to 2026 May 1**.

## Scope of Cycle 2

XRISM observing time is open to the world-wide astronomy community via **3 parallel solicitations**. The call for proposals will be released on **2025 February 14** (the NASA solicitation will be part of **ROSES-2025**).

During Cycle 2, 90% of available time will be made available to GOs, reserving 10% as Director's time for ongoing calibration, real-time TOO requests, and contingencies. (Note that Cycle 1 was special in that 15% of available time was reserved for completion of any priority A PV observations – this block of time will not exist for Cycle 2 and future cycles.)

Assuming a 40 ks of good exposure time per day, the total GO time for Cycle2 is ~6.6 Ms - that's about 80 observations of 80 ks each or 33 observations of 200 ks each.

In Cycle 2 proposals, individual observations are limited to 10-300 ks per pointing, and each proposal can request up to 600 ks of observing time.

There is no mechanism within Cycle 2 to grant coordinated observing time of other observatories; there are no current solicitations by other observatories that can grant coordinated observing time on XRISM.

If your proposed XRISM observation benefits from coordinated NuSTAR observations, their Cycle 11 deadline is coming up in 2 weeks (**2025 February 19**).

## Who May Propose ... and where

- ❑ The institutional affiliation of the PI determines the agency to which proposals should be submitted. There are no restrictions on the affiliations of the co-Is. International teams should **not** submit identical/strongly overlapping proposals on the same targets with the same scientific objective to multiple agencies.
  
- ❖ **NASA** solicitation for researchers based in the US and Canada  
(<https://heasarc.gsfc.nasa.gov/docs/xrism/proposals/prophthread.html>) - 44% of total GO time, proposal deadline of 4:30 pm EDT on 2025 May 15, proposals must be written in English and be dual-anonymous. See also “Type 2 proposal” for US-based researchers.
- ❖ **ESA** solicitation for researchers based in ESA member countries and cooperating states  
(<https://www.cosmos.esa.int/web/xrism/announcements-of-opportunity>) – 8% of total GO time, proposal deadline of 12:30 p.m. Central European Time on 2025 May 15, not dual anonymous.
- ❖ **JAXA** solicitation for researchers in Japan and the rest of the world  
(<https://xrism.isas.jaxa.jp/research/proposer/announcement/index.html>) – 48% of total GO time, of which up to 4% will be made available to PIs outside Japan proposal deadline of 4:30 pm JST on 2025 May 15, not dual-anonymous.
  
- ❑ The above-mentioned web pages currently show Cycle 1 information and will be updated on or about 2025 February 14 with key Cycle 2 specifics, with updated technical information and submission links to follow by ~mid-March.

# Target Priority

Accepted targets will be classified into three priority categories – while target priority is expected to be correlated with proposal ranking, there is no requirement for a strict linkage – for example, a highly ranked proposal might be awarded one priority A and one priority C target).

- ❖ **Priority A targets** (comprising 50% of available GO time) are guaranteed to be observed, with highest priority for observation scheduling. 50% of available time. Time-critical or TOO targets must be Priority A. If not carried out during Cycle 2, Non-TOO Priority A targets will be automatically retained in the target list for observation during future cycles (unless the time-critical condition makes it impossible). If unforeseen issues with the observatory, downlink station etc. reduce the achieved exposure time, Priority A observations are not considered complete unless 90% of approved exposure time is achieved.
- ❖ **Priority B targets** (40% of available time) are guaranteed to be observed. If unobserved during Cycle 2, Priority B targets will be automatically retained for future cycles. The completeness criterion for Priority B observations is 70% of approved exposure time.
- ❖ **Priority C targets** (50% of available time) will be used as scheduling fillers, with the expectation that ~20% (in terms of exposure time) will be observed. Unobserved Priority C targets will not be carried over to subsequent cycles.

Currently unobserved Cycle 1 TOO targets and Cycle 1 priority C targets are fair game for Cycle 2.

## Exposure Time, Target Priority and Related Issues

- ❖ Proposals must specify the total good on-source time of the observation after standard GTI-based data screening (Earth occultation, SAA passages etc.) but not for dead-time.
- ❖ Observations will be scheduled to achieve the approved exposure time plus a small margin, often (but not always) in a single visit.
- ❖ Time-critical observations (for coordination with another observatory, monitoring observations, observations for specific binary phases, roll-constrained observation, and any other reasons) are allowed but must be approved at priority A.
- ❖ TOO observations of specific targets must be approved at priority A; Generic TOO proposals are not allowed
- ❖ For priority A and B targets that fail to meet the completion criteria (interruption by TOO, spacecraft or downlink issues), supplementary observations will be scheduled.
- ❖ This is not the case for Priority C targets.

# Proposal Review and Merging

**Agency Reviews:** each agency (JAXA, NASA and ESA) performs its own peer review to select best proposals for potential implementation. But they do not make the final decision.

**International Merging:** Three observing lists will be combined into a single observing program.

- If a target is common among multiple (provisionally) accepted proposals, the merging committee shall consider if they are true overlaps or if significant differences exist.
- Merging: such overlaps may be resolved by awarding a single observation to both teams, who are strongly encouraged to collaborate, with one person designated as the principal PI (PPI).
- In some cases (e.g., proposer preference not to merge), one of the proposals may be dropped.
- Such merging will be performed on a target-by-target (not proposal-by-proposal) basis.
- Non-merged targets may be affected – priority might change, some may get dropped.

**Final Program:** 50 percent of available time for priority A targets, 40 percent for priority B, and 50 percent for priority C, and with appropriate balance among agencies.



## Events after the Merging Meeting

For Cycle 2, the Merging Meeting will likely take place in late September, 2025. After some additional checks, the final target list will be published on the web and results (including possible mergers) are communicated back to the three agencies.

For US-based proposers with accepted proposals, there is a phase 2 process to request funding.

Next steps: Long-term and short-term observing schedules will be developed.

Some PIs with accepted time-critical proposals may be contacted if there are questions.

Note that some long pointings may have to be broken up into multiple pieces for operational reasons.

When an observation is put in the short-term schedule, the PI will be contacted to double-check the parameters. If there is significant change in the instrument performance or our understanding of the instrument performance, this will be communicated at this stage or before.

Small (<~Resolve FOV) adjustments in the pointing direction is possible at this stage, particularly ones that depend on the actual roll angle of the observation. This could allow for, e.g., better tiling of extended sources, or an offset pointing of a bright point-like source. Larger adjustments, particularly those based solely on science, may be rejected.

## Implications of GVO4

If we carry out GVO4 in 2025 September, and **if it is successful**:

- **We celebrate!**
- We take the additional time necessary to test and calibrate Resolve with the GV open.
- Approved Cycle 2 observations will likely be carried out with the exposure times as proposed – the observations will result in more photons than strictly necessary for the proposed science.

If we decide not to carry out GVO4, or if we do carry it out but the GV remains closed:

- There will likely be a gap in the schedule between the end of Cycle 1 and when we are ready to start Cycle 2 observations. We will observe, e.g., additional Cycle 1 priority C targets – details TBD.

In either case, we intend to release the Cycle 3 call for proposals in the **fall of 2025 without the uncertainty over the GV status**.

## Three different installations of ARK/RPS

ARK/RPS has been developed and maintained at NASA for many Goddard-supported missions – currently used for *NuSTAR*, *NICER*, *IXPE*, *Swift*, *Fermi*, and *TESS*.

NB, for XRISM, **there are three parallel solicitations using three different installations of ARK/RPS**. We expect to open all three version by the mid-March, 2025. For security reasons, **ARK account information is not shared among the three versions**.

❖ **First action:** If you have never used ARK/RPS, or if you plan to submit a XRISM proposal to a new (to you) agency, create an ARK account on the right installation of ARK/RPS, and join the XRISM group; PIs in US or Canada with an existing ARK/RPS account can simply join the XRISM group. Note that we only have a mechanism to prevent submission of XRISM proposals to the wrong ARK/RPS, **we do not have a mechanism to prevent you from joining the XRISM group in the wrong version of ARK/RPS** (e.g., researcher in Germany can create an account and join XRISM group in the JAXA version of ARK/RPS, but they will be prevented from submitting a proposal to the JAXA ARK/RPS.)

Then familiarize yourself with ARK/RPS in general and the XRISM proposal form in particular. See <https://heasarc.gsfc.nasa.gov/ark/xrism/help.html> (already public, with minor updates pending).

# ARK User Profile

Your ARK Profile contains name, affiliation, institutional address (including country) that will be used to automatically fill the PI filed of any proposals you create and/or submit.

If you move to a different institution, you can update your ARK Profile (as long as you know your ARK user ID and password).

Note the last tick box – this is the mechanism to specify whether you want e-mail confirmation when you've submitted a proposal.

**ARK Profile Update**

Note: Required fields are marked with an asterisk (\*).

**User ID** kojimukai

**Title \***  **First \***  **Middle**  **Last Name \***

**E-mail Address \***

**Department**

**Institution \***

Or, if your institution is not listed above, enter it here:

**Address 1 \***

**Address 2**

**City/Town \***

**State/Province \***

**Zip/Postal Code \***

**Country \***

**Telephone \***

**FAX**

**GPG/OpenPGP Key Fingerprint**

Please send an e-mail receipt to me for every data record I submit [?](#)

## Basic Steps

- ✓ Fill all the compulsory & desired fields of the RPS form
- ✓ **Verify** – checks all the compulsory fields are filled, and that all the entries are within the allowed limits. If your form fails, you must modify accordingly.
- ✓ **Submit** – this button will **only** appear if your form has been successfully verified.
- ✓ **Upload** – when you submit, you will be invited to upload the scientific justification as a PDF file (and a second PDF for NASA, see later) – this can be done later.

You can use the “Show all proposals” link to see your proposals – you can discard or modify the forms, or (re)upload PDF files to keep working on the proposals up until the deadline.

We recommend keeping a PDF copy of your submitted forms for your own record.

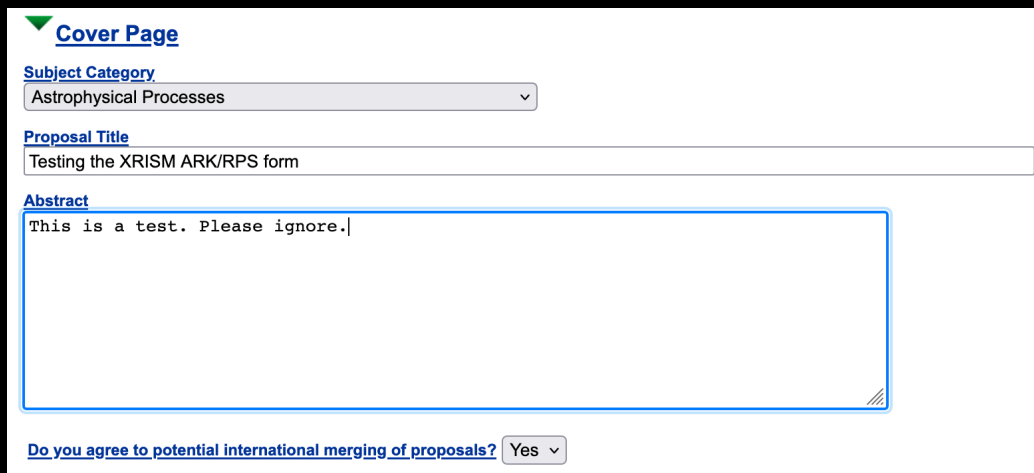
When your ARK/RPS session times out, your form in progress will be lost – you can save and reload forms in progress before Verify/Submit as a safeguard.

# Cover Page

On the cover page, pick the appropriate “Subject Category”, type in proposal title and abstract (without LaTeX etc. mark-ups).

Subject category (when correctly chosen) help us select the right expertise to review the proposal.

You can opt out of potential merging.



The screenshot shows a web form titled "Cover Page". It includes a "Subject Category" dropdown menu with "Astrophysical Processes" selected. Below it is a "Proposal Title" text box containing "Testing the XRISM ARK/RPS form". The "Abstract" section is a large text area with the text "This is a test. Please ignore." At the bottom, there is a question "Do you agree to potential international merging of proposals?" with a "Yes" button.

- ✓ Select...
- Solar System
- Stellar Coronae, Winds, and Young Stars
- Accreting White Dwarfs and Novae
- BH and NS Binaries
- Non-Accreting Neutron Stars
- Supernova Remnants
- Galactic Diffuse Emission and Surveys
- Normal Galaxies: Integrated Emission
- Extragalactic Transients: SNe, GRBs, GW Events, and TDEs
- Blazars and Other Jet-Dominated AGN
- Non-Jet-Dominated AGN
- Groups and Clusters of Galaxies
- Extragalactic Diffuse Emission and Surveys
- Astrophysical Processes

# Target Form

You start by clicking on “Add Target” button to reveal the Target Form (you can subsequently add or delete targets).

Target name, RA and Dec, total time (10-300 ks), and estimated count rates are obvious.

You can use “number of observations” of  $>1$  to divide your total exposure into  $n$  equal-length sub-pointings (for monitoring observations)

Resolve branching ratio: estimated fraction of  $H+Mp$  events from, e.g., WebPIMMS.

Finally, agree (or not) to Xtend transient search outside the Resolve FOV.

The screenshot shows a web form titled "Target: 1". It includes a "Do you want to delete this target?" dropdown menu set to "No". Below is a "Target Name" input field. The "Target Position, J2000 Equinox" section includes a search icon and a link: "Look up the position of the target named in the above field using SIMBAD, Sesame (VizieR), and NED or use the HEASARC Coordinate Converter." This is followed by "R.A." and "Dec." input fields. The "Total Observation Time" is an input field with "ksec" next to it. "Number of Observations" is an input field with the value "1". "Resolve Count Rate" is an input field with "counts/sec" next to it. "Resolve Branching Ratio" is an input field. "Resolve Filter" is a dropdown menu set to "Open". "Xtend Count Rate" is an input field with "counts/sec" next to it. "Xtend Option" is a dropdown menu set to "Full". At the bottom, there are two "Yes/No" dropdown menus: "Do you agree to Xtend Transient Search by the XRISM team?" (set to "Yes") and "If Yes, do you want to be a co-author of the telegram?" (set to "No"). A note at the bottom states: "Note: Even if you would be a co-author, the XRISM team will not contact you prior to [ATel](#) and/or [GCN](#) submission because of the need for rapid circulation."

# Target Form (continued)

The RPS form for XRISM recognizes 5 different ways in which XRISM observations can be time-constrained.

Coordinated – remember, the time on partner observatory must be secured separately this cycle.

Specific date range – catch-all category.

Monitoring – if you want to divide your “pointing” into multiple pointings to probe variability. Specify number of observations >1 and specify the desired interval.

Phase dependent – relevant to binaries with orbital period substantially longer than the duration of observation.

Roll dependent – if you want Resolve FOV in certain orientation, this (if possible) translates to a time constraint.

The screenshot displays a web form with several sections, each with a checkbox for 'Yes' and associated input fields:

- Coordinated Observation?**  Yes. Includes fields for Observatory and Description.
- Specific Date Range?**  Yes. Includes Start and End fields, both labeled 'MJD — Specify the date/time in UTC using the interface. Altern...'. The 'End' field also includes 'MJD'.
- Monitoring Program?**  Yes. Includes Minimum Interval and Maximum Interval fields, both labeled 'ksec'.
- Phase-Dependent Observation?**  Yes. Includes Ephemeris Epoch (labeled 'MJD — Specify the date/time in UTC using the interface. A...'), Ephemeris Period (labeled 'days'), Minimum Phase, and Maximum Phase fields.
- Roll-Dependent Observation?**  Yes. Includes Minimum Roll and Maximum Roll fields, both labeled 'deg'.



# Target of Opportunity Proposals

You cannot mix TOO and non-TOO observations in a single proposal, so this tick box is on the cover page.

TOO proposals for a specific target or a list of specific targets are allowed, but not a generic (“nearby supernova”) TOO proposals on unknown targets.

Triggering criteria must be clearly specified and estimated trigger probability (for the entire proposal, not on a target-by-target basis) must be provided.

Up to 10 candidate targets can be specified. Multi-candidate TOO proposals can request observation of any or all of the targets that satisfy the triggering criterion – as long as the total exposure time does not exceed 600 ks.

It’s okay to have 10 candidates of 150 ks per target, if ”maximum number of triggers” is 4 or fewer.

The screenshot shows a web form titled "Target(s) of Opportunity Proposal?". At the top right, there is a checkbox labeled "Yes". Below this, there are four input fields: "Trigger Probability" (a small rectangular box), "Maximum Number of Triggers" (a small rectangular box), "Exposure Expectation Value" (a larger rectangular box followed by the text "ksec"), and "Remarks" (a large rectangular text area with a small icon in the bottom right corner).

## TOO Proposals (continued) – Exposure Expectation Value

How much time should we put aside for TOO proposals? We use probability-weighted time.

In the general case, it's very tricky to calculate – but it's less difficult for the proposal PI than for the GOF staff or reviewers, so **we ask you to estimate this number** and enter into “exposure expectation value” field.

- Simplest case - a single target, exposure time of T, trigger probability of P – enter T times P.
- Next simplest case – n candidates, all same exposure. Just remember you can't sum the probability, you have to do something like  $1-(1-p)^n$  as the proposal-level trigger probability, required by the form.
- If you request "max trigger">1, then you have to add “probability of triggering once” times T, probability of triggering twice times 2T etc.
- We do not recommend – although we do allow – n-candidate, multi-trigger (<n) TOO proposals with different exposure times for different targets.
- ✓ This would mean that the order in which these targets trigger matters. This might depend not only on individual trigger probability but how the XRISM visibility windows are ordered.

Good news – exposure expectation values need not be highly accurate – a difference of 5 ks may not be important when allocating 10 Ms of observing time.

## For US-based investigators only

- ✓(Also for Canadians): The reference list does not count against the 4-page page limit
- ✓(Also for Canadians): The form and the scientific justification should be written anonymously, and a second, non-anonymized document describing team “expertise and resources” must also be uploaded.
- ✓US-based PIs will be eligible to receive funding from NASA
  - Eligible PIs will be contacted to submit Stage 2 (budget) proposals.
- ✓**Supporting Atomic Physics (SAP, or “Type 2”) proposals**
  - Interpretation of XRISM/Resolve data may require an improved knowledge of atomic physics.
  - Proposals for (up to) 3 year funding of either theoretical or experimental investigation will be solicited at the same time but via NSPIRES
  - Such proposals must be explicitly tied to expected XRISM science.

# Future Cycles

Future announcements are anticipated annually.

- We will consider introducing Key Projects category or similar to allow large projects.
- Joint proposals with several missions (e.g., NuSTAR, NICER, XMM-Newton, Swift) will likely be allowed, subject to successful negotiations. This allows proposers to secure time on multiple missions by submitting a single proposal.
- This was considered too complicated for implementation during Cycles 1 (given the various uncertainties of a mission yet-to-launch) and Cycle 2. Proposers are free to arrange joint observations by submitting proposals to XRISM and other missions.