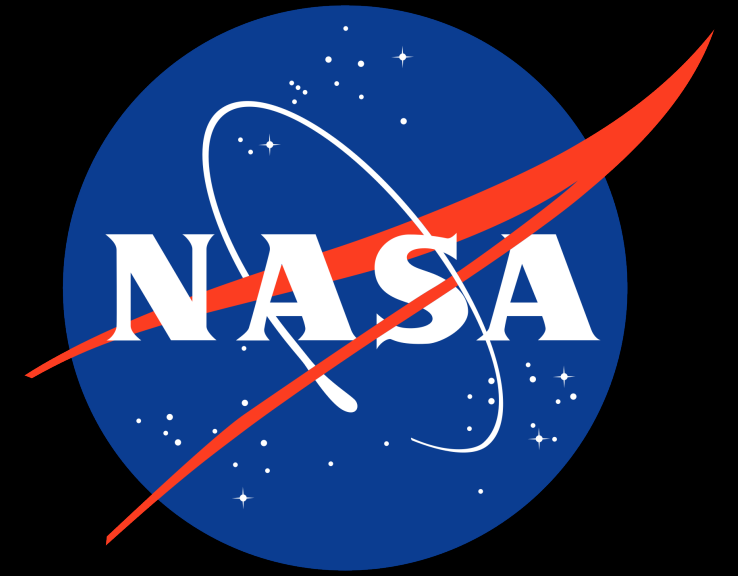


X*Ri*SM

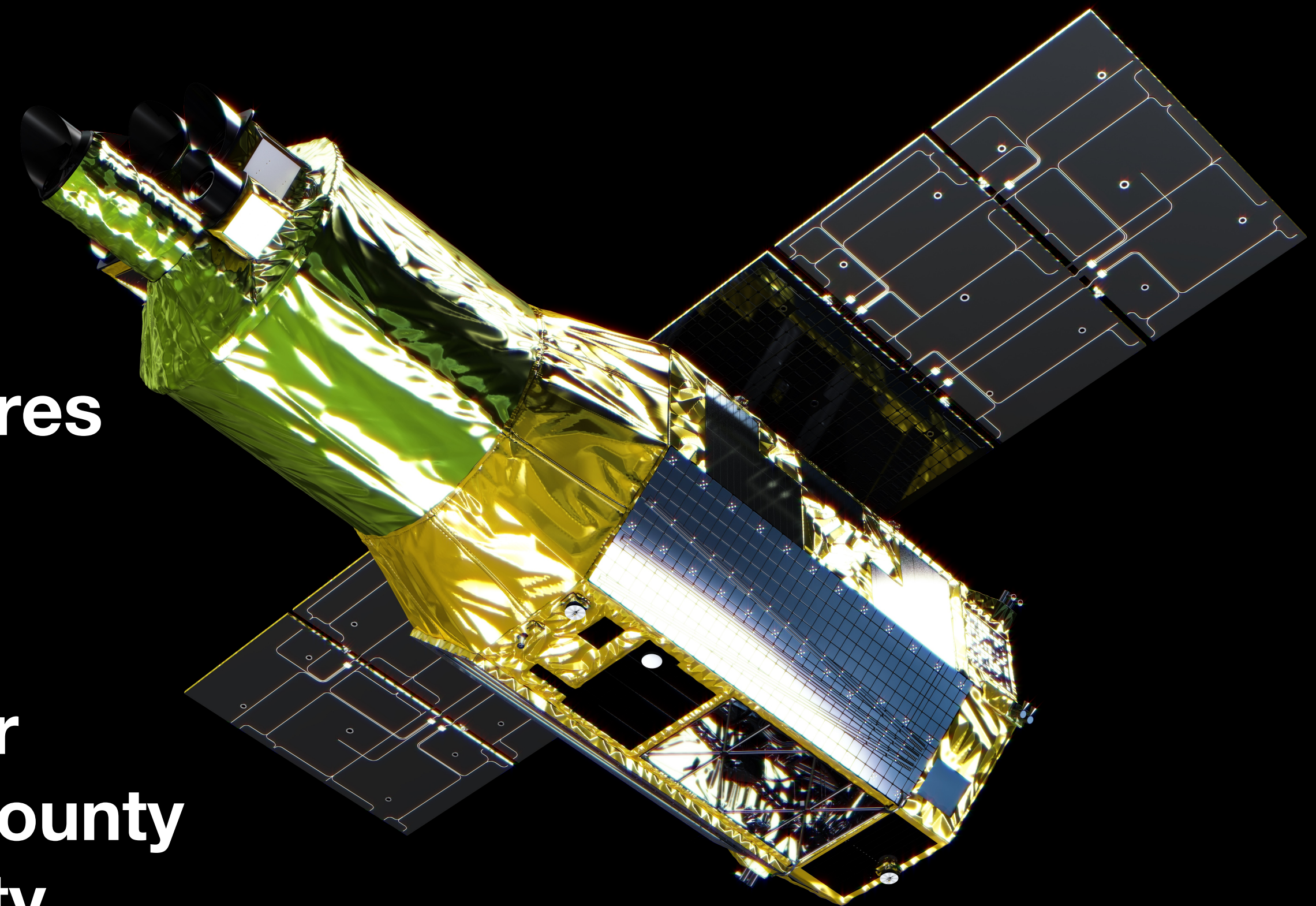
X-Ray Imaging and
Spectroscopy Mission



A01 Policies and Submission Procedures

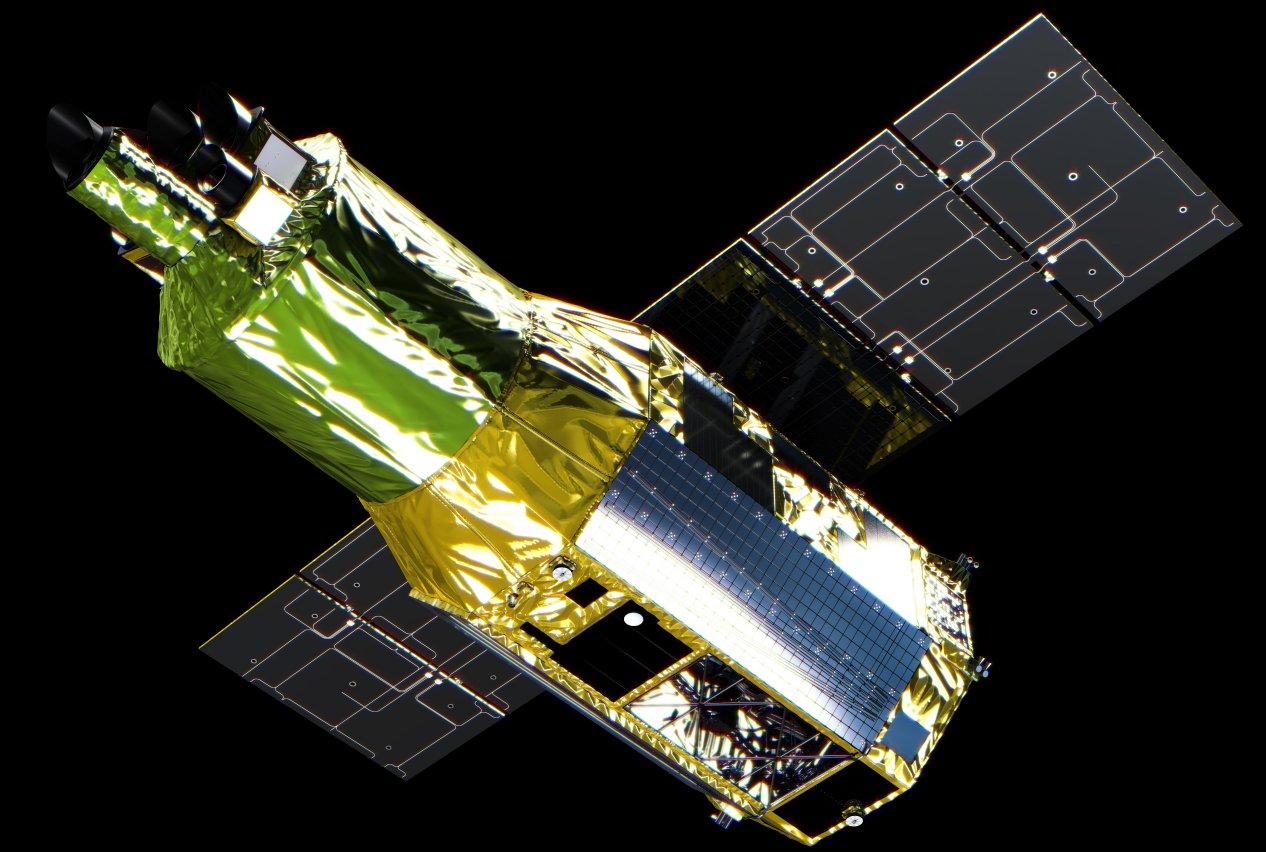
Koji Mukai

**NASA Goddard Space Flight Center
and University of Maryland, Baltimore County
NASA XRISM Guest Observer Facility**



XRISM Mission Timeline

- ❖ Currently undergoing integration and test in Japan
- ❖ Launch planned during calendar 2023 – likely mid-May.
- ❖ After 4-month commissioning period, there will be a 6-month Performance Verification (PV) phase during which targets selected by the XRISM Science Team will be observed
<https://heasarc.gsfc.nasa.gov/docs/xrism/timelines/pvtargets.html>
- ❖ After the PV phase, the mission will be run as an observatory open to all.
- ❖ For a May, 2023 launch, AO-1 observations will start in March, 2024.
- ❖ Call for proposals will be released around July 2023 and AO-1 proposals are due in October, 2023. (cf. NICER, Swift, and XMM-Newton all have deadlines in September or October!)



Who May Propose ... and where

XRISM observing time is open to the world-wide astronomy community via 3 parallel solicitations. 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.

- ❖ **NASA** solicitation for researchers based in the US and Canada - 44% of total GO time.
 - ❖ **ESA** solicitation for researchers based in ESA member countries – 8% of total GO time.
 - ❖ **JAXA** solicitation for researchers in Japan and the rest of the world – 48% of total GO time, of which up to 4% will be made available to PIs outside Japan.
- International teams should **not** submit identical/strongly overlapping proposals on the same targets with the same scientific objective to multiple agencies.

During AO-1, 15% of available time will be reserved to complete any priority A PV observations that could not be carried out during the 6-month PV phase, and 10% will be Director's reserve for on-going calibration and real-time target of opportunity observations.

Assuming a 45% observing efficiency, the total GO time for AO-1 is approximately 10.6 Ms - that's about 130 observations of 80 ks each.

What Objects to Propose

XRISM is a general purpose-observatory, so any celestial objects can be observed. It is your job to tell us what to observe, and to convince the peer review that it's a good idea.

However,

- ❖ X-ray flux/surface brightness: you need plenty of counts to make good use of the spectral resolution of Resolve – there are ~2000 resolution elements in its bandpass. A flux of 3×10^{-11} erg/cm²/s is of order 2 cps with Resolve. There are 2528 entries in 4XMM-DR12 (but probably ~1000 objects), and 617 sources in Swift 2SXPS at this flux level.
- ❖ Be aware of what will be observed/may be observed during the PV phase (36 priority A targets, 23 priority C targets including 7 additional pointings of priority A targets).
- ❖ TOO proposals for a specific target, or a list of (up to 10) specific targets, are allowed. TOO proposals for generic targets (unknown target belonging to a class, such as a “nearby supernova”) are not allowed.
- ❖ Some solar system objects can be observed, but Sun angle constraints preclude inner Solar system objects, and XRISM cannot track fast-moving targets.

Resources for Proposers

- **Proposers' Observatory Guide** – in advance state of preparation.
- This workshop
- XRISM GOF web page (<https://heasarc.gsfc.nasa.gov/docs/xrism/>)
- General HEASARC resources (object catalogs, observing log of other X-ray missions, ...)
- Viewing (<https://heasarc.gsfc.nasa.gov/cgi-bin/Tools/viewing/viewing.pl>) already includes visibility window information for XRISM.
- PIMMS (<https://heasarc.gsfc.nasa.gov/cgi-bin/Tools/w3pimms/w3pimms.pl>) will include XRISM Resolve and Xtend; for Hitomi SXS, PIMMS included first-order estimate of High Res/Mid Res etc. division, which will be resurrected and updated.
- WebSpec (<https://heasarc.gsfc.nasa.gov/webspec/webspec.html>) will include XRISM Resolve and Xtend.
- More advanced simulation tools (see talks of HEASim and SimX this afternoon).

Submission Mechanics

ARK/RPS will be used for proposal form submission, with the contents to be uploaded as PDF files.

- ❖ For submission to NASA, the existing ARK/RPS at HEASARC (currently used for missions such as NuSTAR, NICER and Swift) will be used.
 - Proposals must be written in English.
 - Scientific Justification must follow the dual-anonymous rules; separate "team expertise" document is also needed to complete submission.
 - Will likely supply templates.
- ❖ For submission to JAXA and to ESA, new installations of ARK/RPS at these agencies will be used.
 - The ARK/RPS user accounts will not be shared – even PIs with existing ARK account at HEASARC will need to create a new account to submit XRISM proposals to JAXA or to ESA.
 - For further details, consult each agency's instruction pages.

The detailed contents of the RPS form have been largely determined but may undergo further fine-tuning before AO-1.

Proposal Review and Merging

Agency Reviews: each agency (JAXA, NASA and ESA) performs its own peer review to select best proposals for potential implementation.

International Merging: Three observing lists will be combined to construct 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.

Final Program: 50 percent of available time for priority A targets, 40 percent for priority B, and 50 percent for priority C (with the expectation that 100% of A & B targets, and of order 20% of accepted C targets will be observed), and with appropriate balance among agencies.

For US-based investigators only

- ✓ 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) 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 as AO-1 observing proposals
 - Such proposals must be explicitly tied to expected XRISM science.

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, remember) must be approved at priority A.
- ❖ If approved exposure time was not achieved (interruption by TOO, spacecraft or downlink issues), supplementary observations will be scheduled.
- ❖ Priority C targets are schedule fillers – if not observed within the cycle for which they were approved, they will not be carried over to the next cycle.
- ❖ Priority A & B targets will be carried over to subsequent cycles if necessary, except (1) untriggered TOO targets; and (2) time critical observations whose constraints can no longer be met.

Future AOs

Future AOs are anticipated annually.

- No more time for the Science Team – GOs get 90% of total time, with 10% being reserved for ongoing calibration, unanticipated TOO's and other director's discretionary observations.
- 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 AO-1, given the various uncertainties of a mission yet-to-launch. Proposers are free to arrange joint observations by submitting proposals to XRISM and other missions.

Reminder: Resolve and Xtend are co-aligned and always operate simultaneously.