



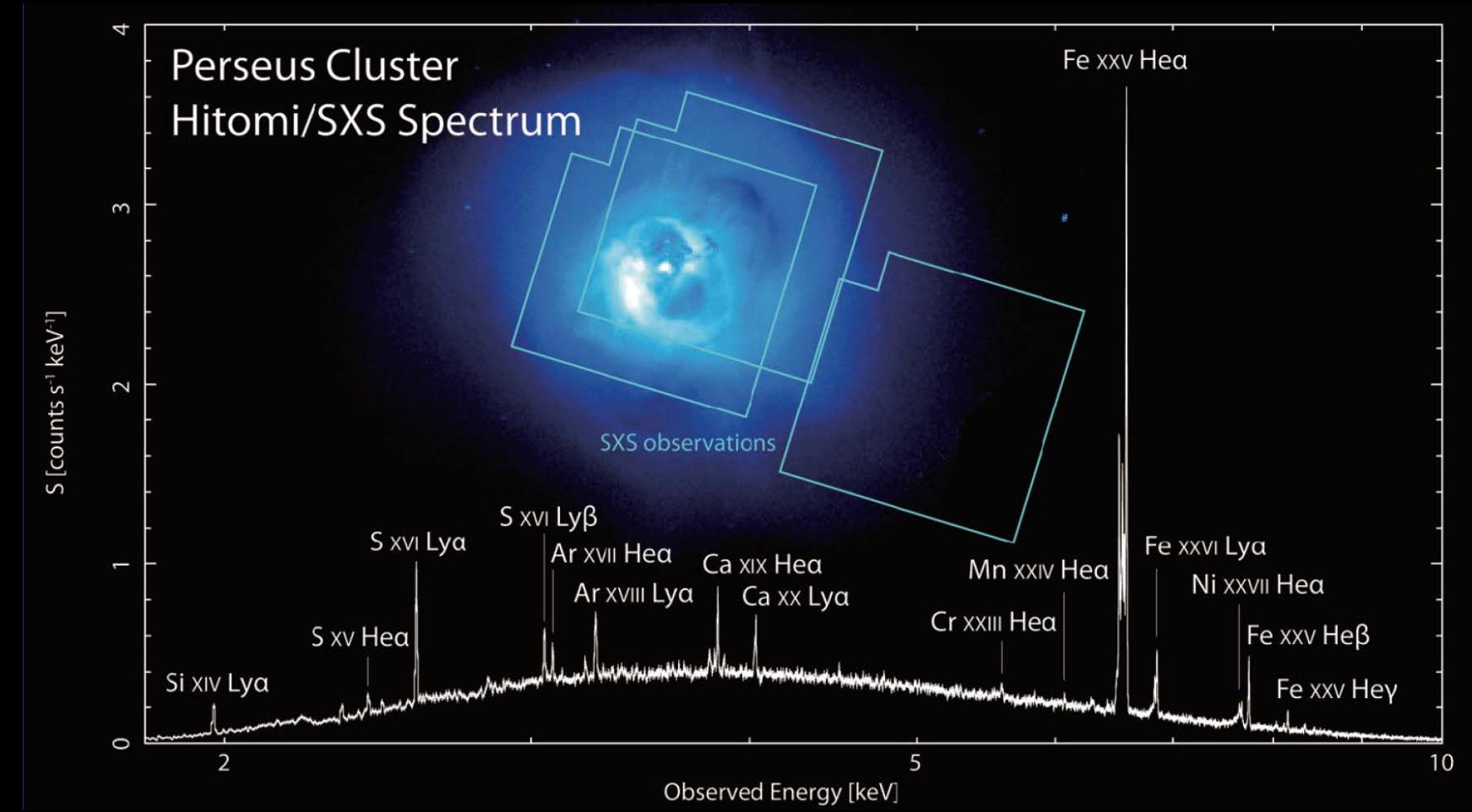
XRISM: MISSION STATUS

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on behalf of XRISM team



A NEW WORLD OF X-RAY SPECTROSCOPY SHOWED BY HITOMI

- Perseus Cluster
- N132D
- IGR J16318-4848
- RX J1856.5-3754
- G21.5-0.9
- Crab
- ... to be continued by XRISM





SCIENCE OF XRISM

- How does the large structure formed?
 - What forms and sustain the clusters of galaxies structure against gravity ?
 - Gas pressure, **turbulence**, and their spatial distribution
- How was the elements and energy produced and distributed in the universe ?
 - Metallicity of SNs and their remanants
 - Dissipation of the material
 - **Velocity** of elements of SNR metals and Accretion and **outflow (winds)** of AGNs, galaxies
- New astrophysics with X-ray micro-calorimeter



MISSION CONCEPT OF RECOVERY

- Recovery of X-ray fine spectroscopy
 - Recover the X-ray micro-calorimeter science, ASAP
 - Conservative combination with conventional CCD covering same energy band



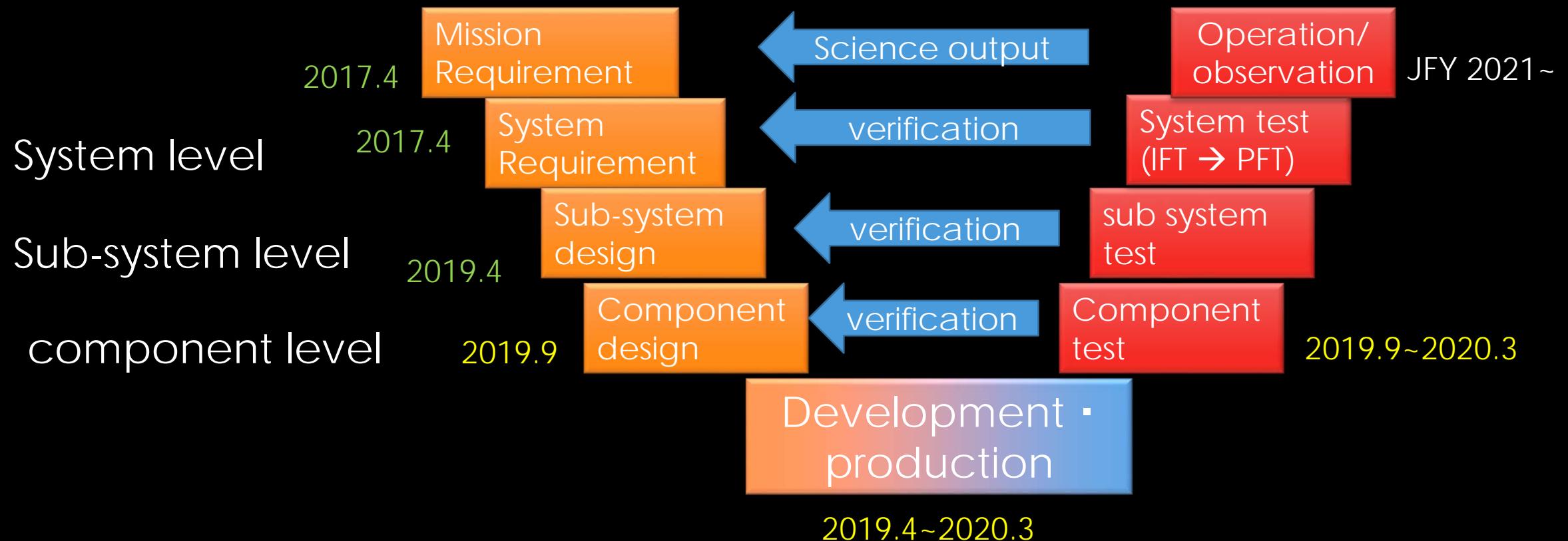
Instrument	FOV/pix	ΔE (FWHM @6 keV)	Energy band
Resolve (XMA + X-ray microcalorimeter)	2.9' □ / 6 x 6 pix	7 eV (goal 5 eV)	0.3 – 12 keV
Xtend (XMA + X-ray CCD)	38' □/ 1280 x 1280 pix	< 250 eV at EOL (< 200 eV at BOL)	0.4 – 13 keV



Mass	2.3 t
Dimension	7.9 m x 9.2 m x 3.1 m
Design life	3 years + cryogen free operation
Orbit	Altitude 575 +/- 15 km, Inclination 31 degree



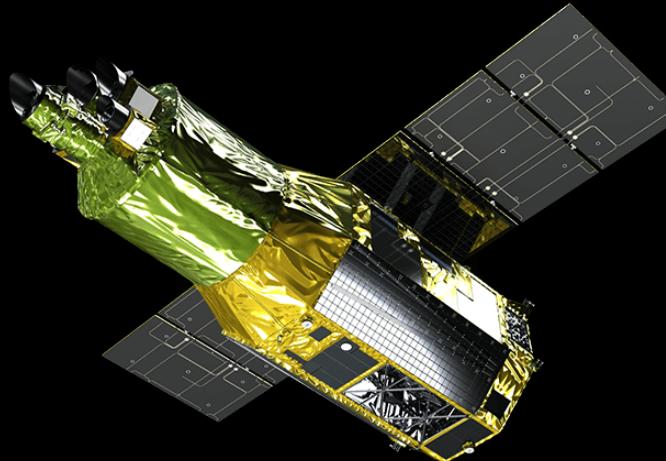
DEVELOPMENT STATUS





STATUS: SPACECRAFT

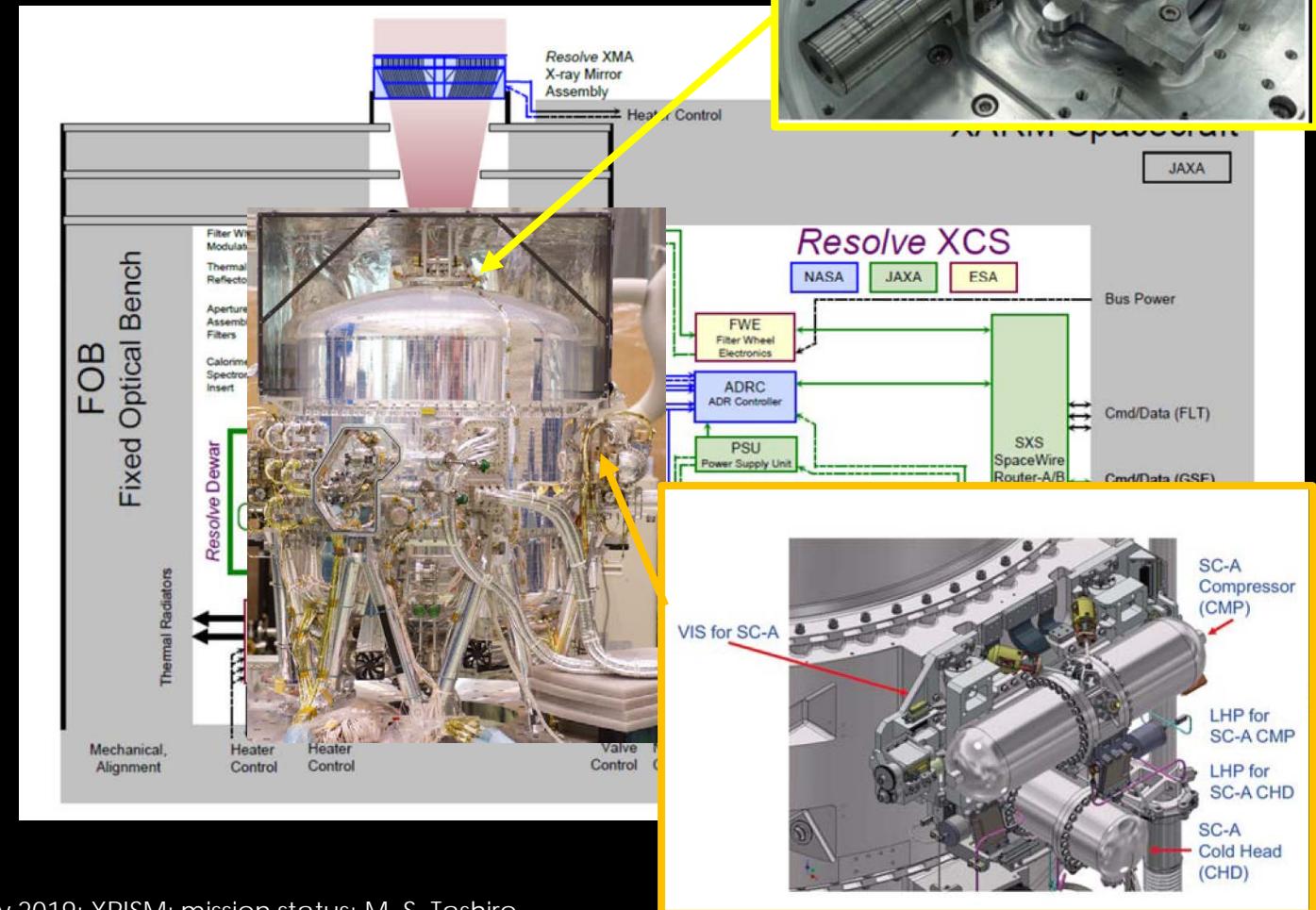
- Major changes from Hitomi;
 - Attitude Control System
 - Sensors
 - STT → conventional and reliable model, → user 2 out of 3 sets
 - DSS → wider FOV, (cold) redundant system
 - Processor (software)
 - Fault Detection Isolation Reconfiguration → reviewed and revised; will test as we fly





STATUS: RESOLVE

- Dewar
 - DWR Gate Valve open; XRISM introduces *Eddy Current Dumper* to reduce shock to thermal/optical filters
 - Mechanical Cooler micro-vibration isolator; XRISM introduces launch lock system to have tolerance to the new mechanical environment due to the dual launch.





STATUS: RESOLVE

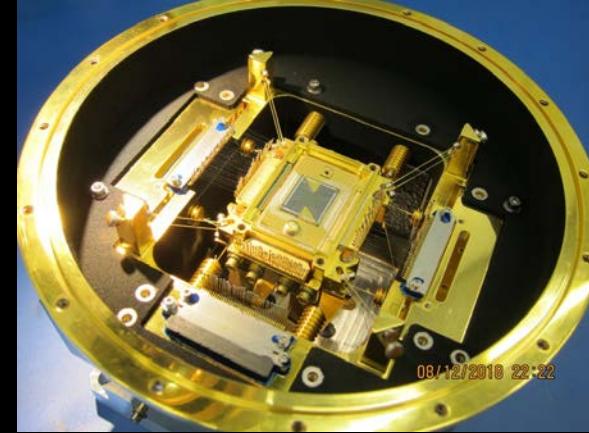
Resolve sensor
@ NASA/GSFC

Status

- FM Detector performance is as expected.
- FM *Calorimeter Sensor Insert* (CSI) has been fabricated → now on-ground calibration

Plan

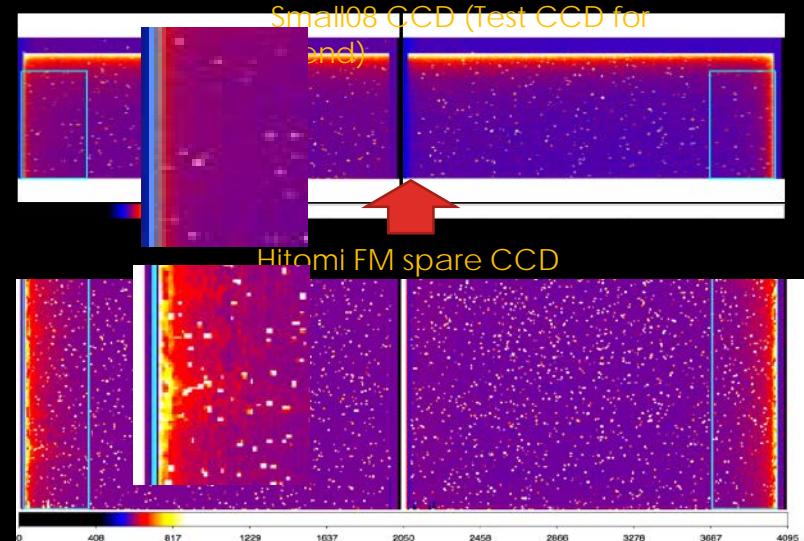
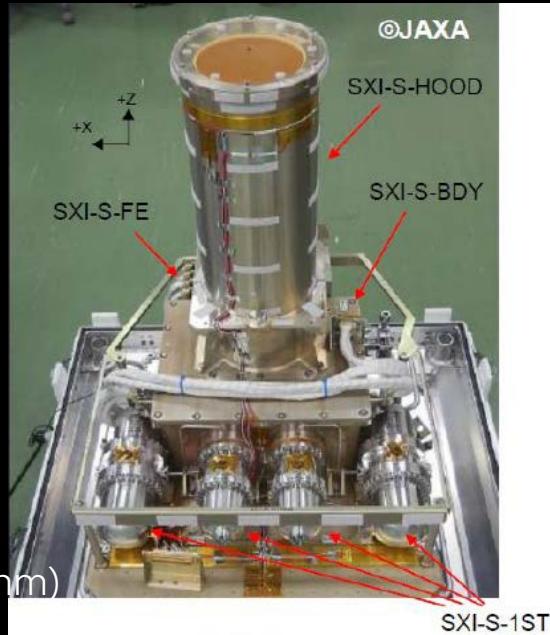
- Pre-Shipment Review is held in the next week
- CSI will be shipped to Japan, after calibration
- CSI installation is planned in November in SHI.





STATUS: XTEND

- *Hitomi-SXT/SXI* worked well but light leakage through the HXT light path was observed
→ XRISM Xtend
 - requires “darkness” in the Spacecraft
 - Improve process to reduce light leak through “pin holes” on the Optical Blocking Filter
- Status:
 - CCD chips; selected FM 4 chips out of 12
→ now under calibration
 - Camera system; industrial CDR was finished
→ Under production

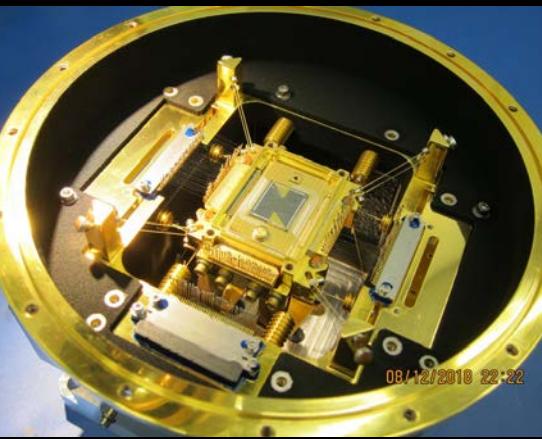




SUMMARY OF MISSION INSTRUMENT PRODUCTION

- Resolve
 - XMA (fabrication → assembly)
 - CSI
 - Detector Array (completed → cal)
 - ADR (completed)
 - ApA (completed)
 - ADRC (assembly)
 - DWR, cooler, CD (assembly)
 - Xbox (nearly completed)
 - PSP (fabrication)

Resolve sensor
@ NASA/GSFC

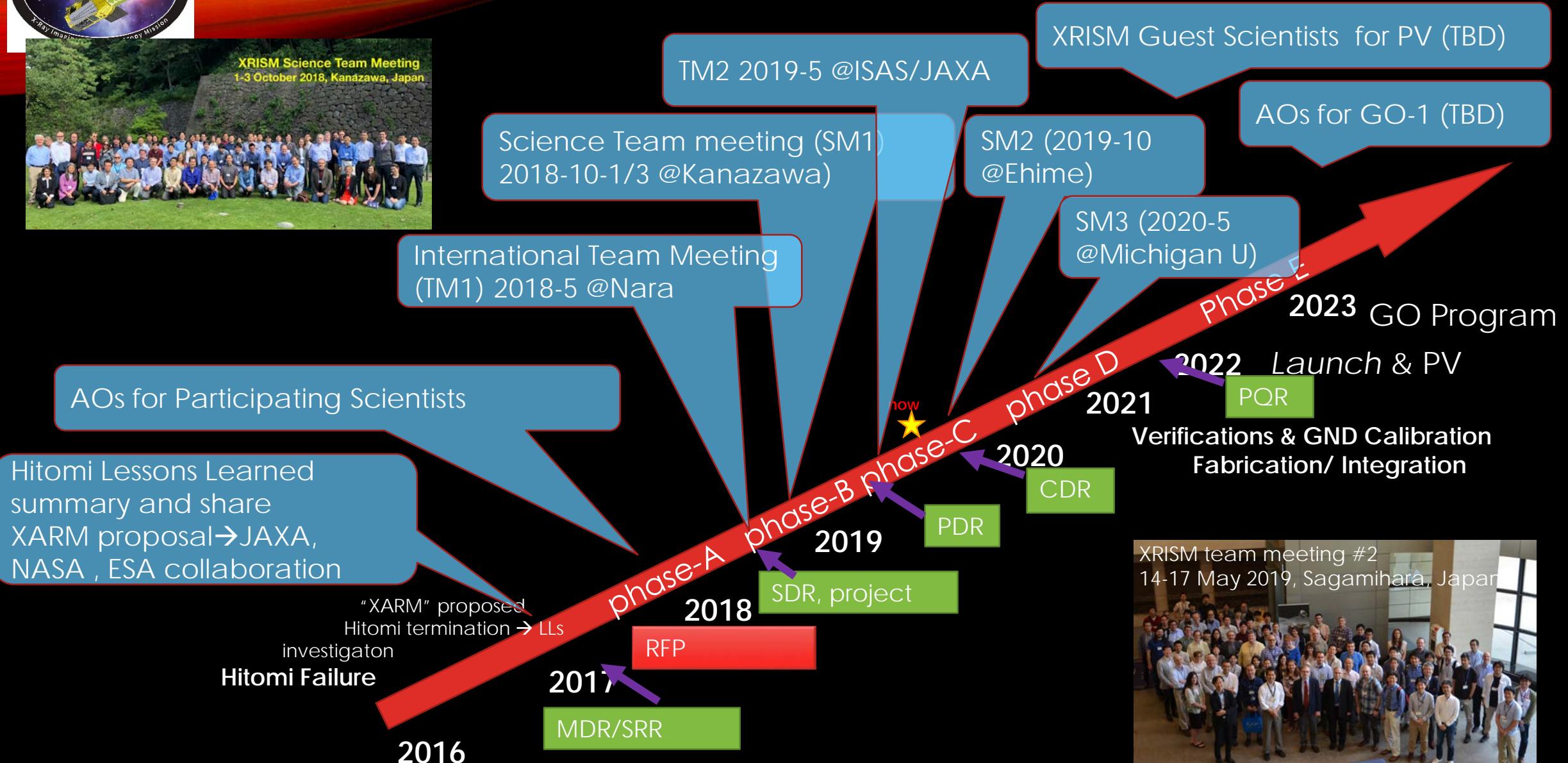


- Xtend
 - XMA (fabrication → assembly)
 - CCD (screening → calibration)
 - SXI-S (procurement)
 - Electronics (procurement/assembly)

Mile stones...
2019-12 system integration 1
2020-04/05 mission I/F test
2020-07 system integration 2, 3, 4
2021-01 proto-flight test

2022-01 launch

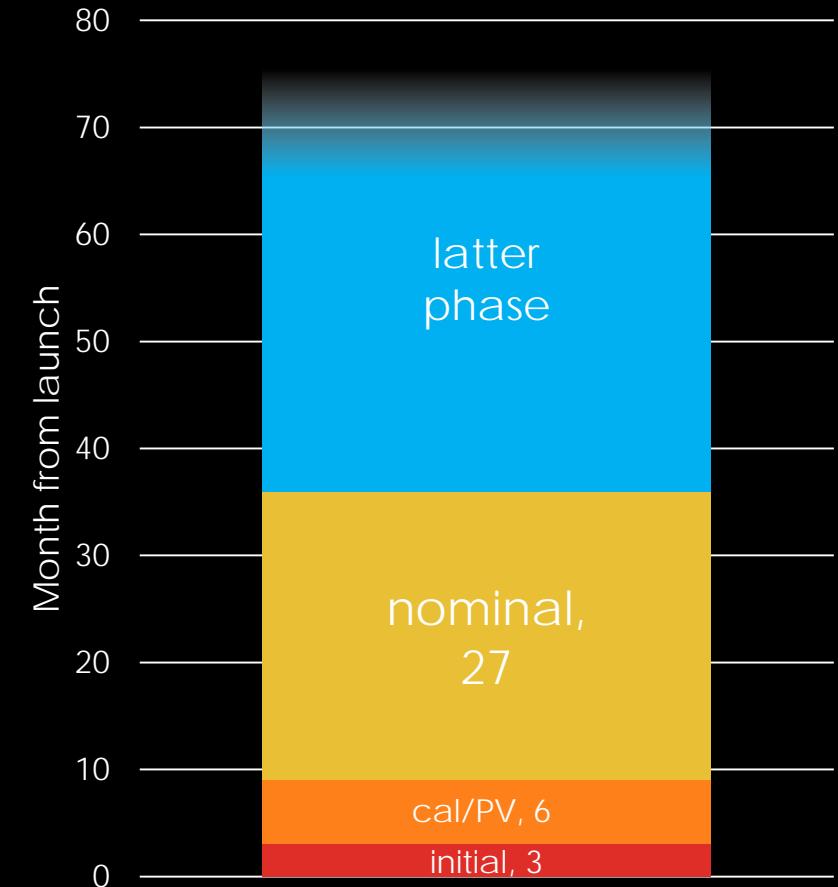
FOR SCIENCE PRODUCTION





OPERATION PHASES AND GUEST OBSERVER PROGRAM

- Initial phase (launch to 3 months)
 - Critical operation (~ 1 week (TBD))
 - Commissioning (~ 12 weeks (TBD))
- Nominal phase(until 3 years after launch)
 - Initial calibration & performance verification (~ 6 months)
 - Nominal observation (GO phases)
(mission completion/extension review)
- Latter phase





XRISM FOR YOUR SCIENCE



JAXA(Japan
Aerospace
Exploration
Agency)



NASA(National
Aeronautics and
Space Agency)



ESA(European
Space Agency)



Tokyo Metropolitan
University



Kanazawa
University



Osaka University



University of
Miyazaki



Saitama University



SRON(Netherlands
Institute for Space
Research)



UNIVERSITÉ DE GENÈVE
FAUTEUIL DES SCIENCES
Physique et Chimie



University of
Geneva



Canadian Space
Agency



Gravitation
AstroParticle
Physics Amsterdam



Canadian Light
Source Inc.



University of
Chicago



Chuo University



Durham University



Ehime University



European Sauthier
Observatory



Fujita Health
University



Harvard-
Smithsonian Center
for Astrophysics



Hiroshima
University



Kanto Gakuin
University



Kwansei Gakuin
University



Kyoto University



Lawrence
Livermore National
Laboratory



Leiden University



University of
Maryland



Massachusetts
Institute of
Technology



University of
Michigan



Nagoya University



Nara University of
Education



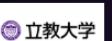
Nara Women's
University



Nihon Fukushi
University



RIKEN



Rikkyo University



Saint Mary's
University



Shibaura Institute
of Technology



Shizuoka University



Tohoku Gakuin
University



University of Tokyo



Tokyo University of
Science



Waseda University



University of
Waterloo



University of
Wisconsin



Yale University