

Closing remarks 16th IACHEC workshop



La Granja, Segovia

Kristin K. Madsen
Chair of the
IACHEC



Attendance

IACHEC year	Location	Number of participants	Number of talks
2006	Iceland	36	26
2007	California	35	30
2008	Germany	36	26
2009	Massachusetts	35	34
2010	Italy	45	50
2011	California	44	38
2012	UK	40	29

IACHEC year	Location	Number of participants	Number of talks (plenary)
2013	Virginia	42	48 (20)
2014	PRC	51	54 (24)
2018	Italy	57 + 37 students	45 (30)
2019	Japan	65	70 (36)
2023	Germany	60	63 (44)
2024	Spain	61	65 (40)

Paper status

Paper	WG shepherd	Status
Concordance #3	Cal. Stats	In prep
C-stat: foundation	Cal. Stats	Meng et al
Contamination	Contamination	Overleaf outline circulated
3c273	Coordinated	Data analysis underway; may include XRISM
Background	Detector & Background	Under consideration; discuss next meeting
MMS	Galaxy Clusters	Data review/collection
Crab	Non-thermal	On overleaf; mature draft; include data up to 2020
G21.5-0.9	Non-thermal	Delayed: needs a planned kickoff meeting
PSR B1509-58 (INTEGRAL,+)	Non-Thermal	under consideration (delayed)
N132D	Thermal	Data analysis is almost done; Still need to identify a paper lead
Crab cross-timing calibration	Timing	Drafting by next 2025
XRISM timing	Timing	Could go into cross-timing paper
RXJ1856-3754 + WD	WD & INS	Make overleaf outline and circulate

2023: The New Kids On the Block



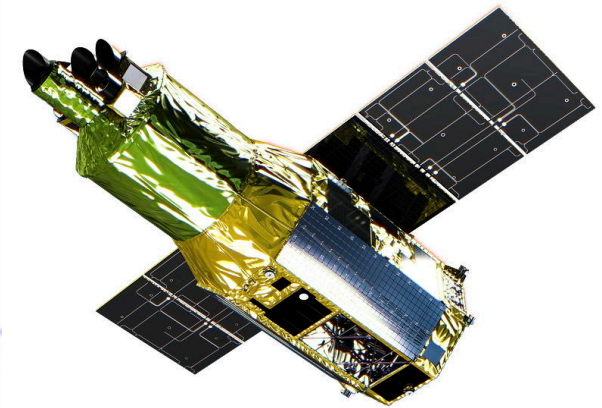
2024



愛因斯坦探針
einstein probe

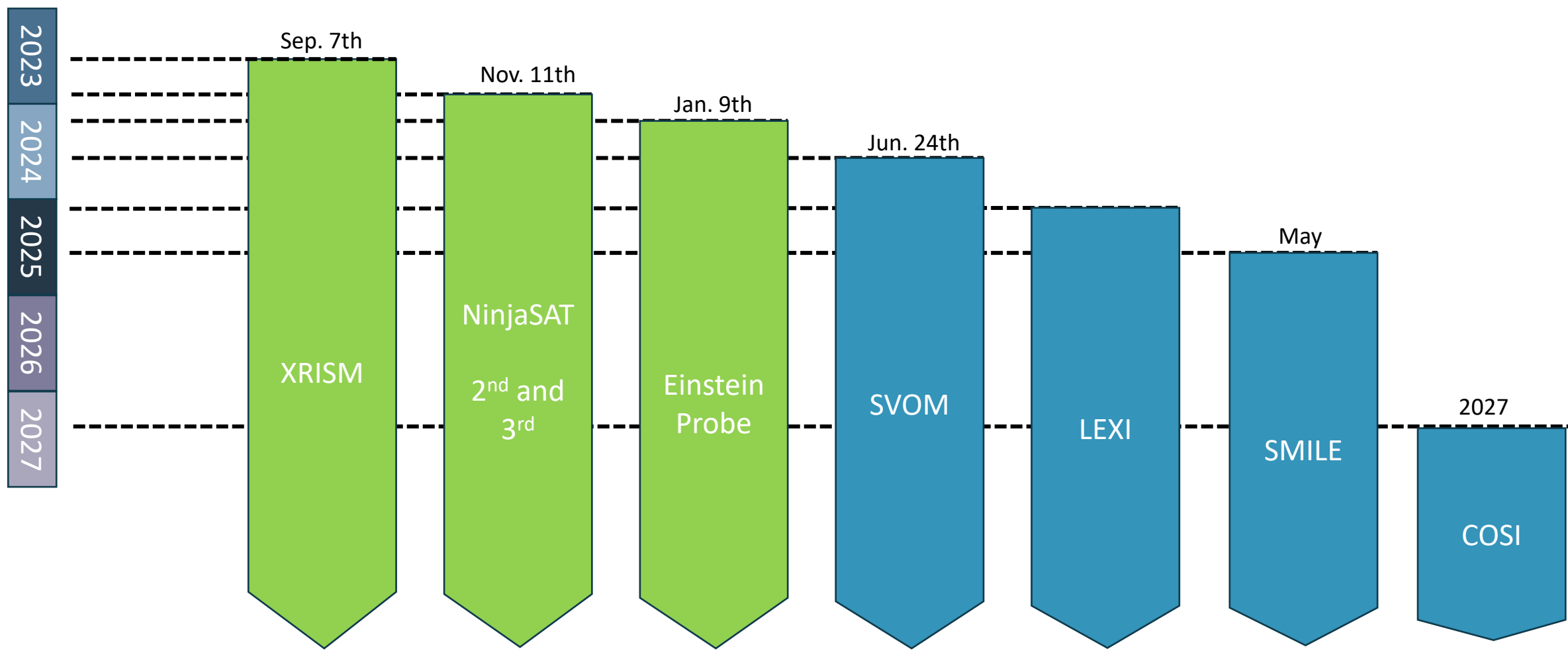


Congratulations!

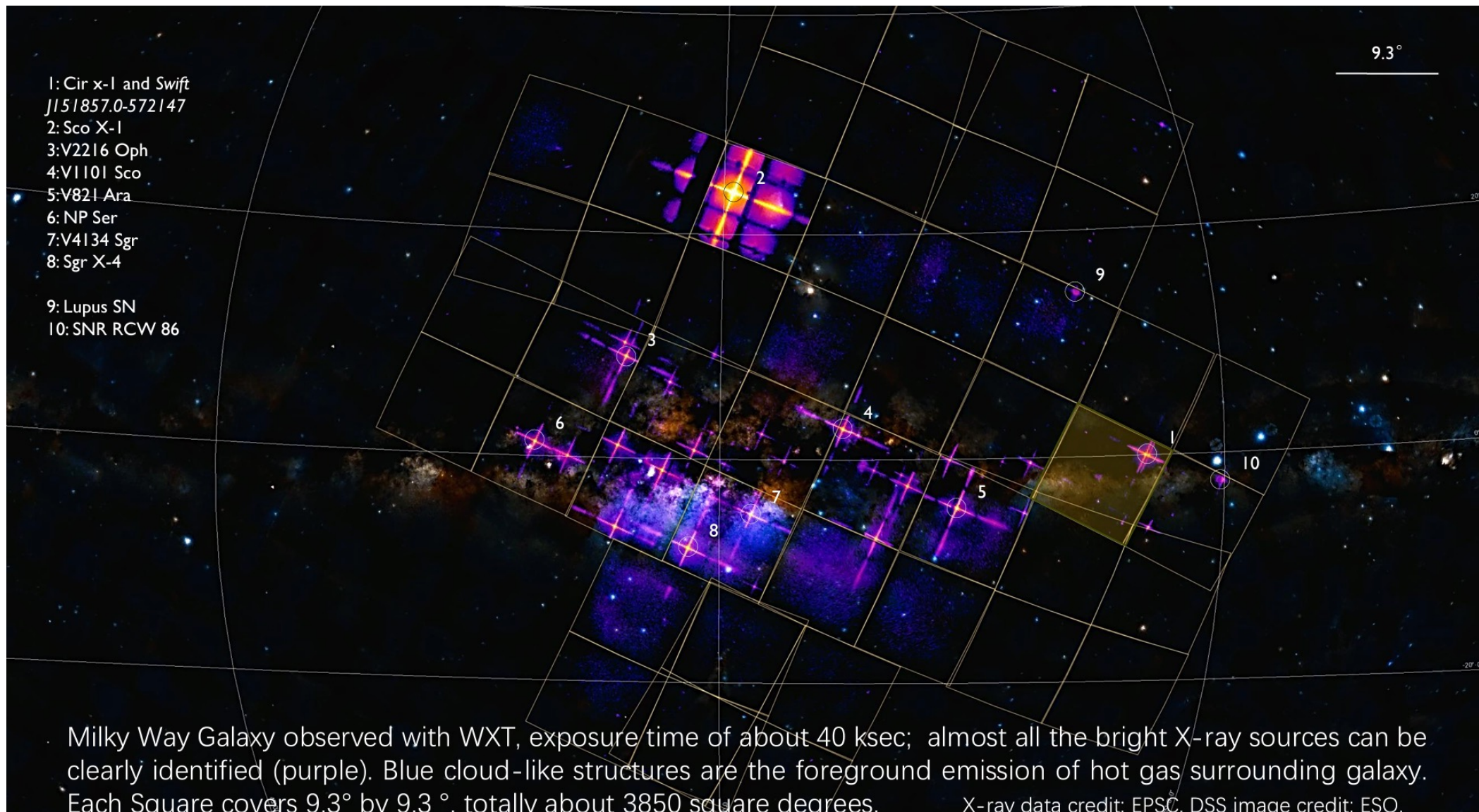


XRISM X-Ray Imaging and Spectroscopy Mission

Welcome to the playground

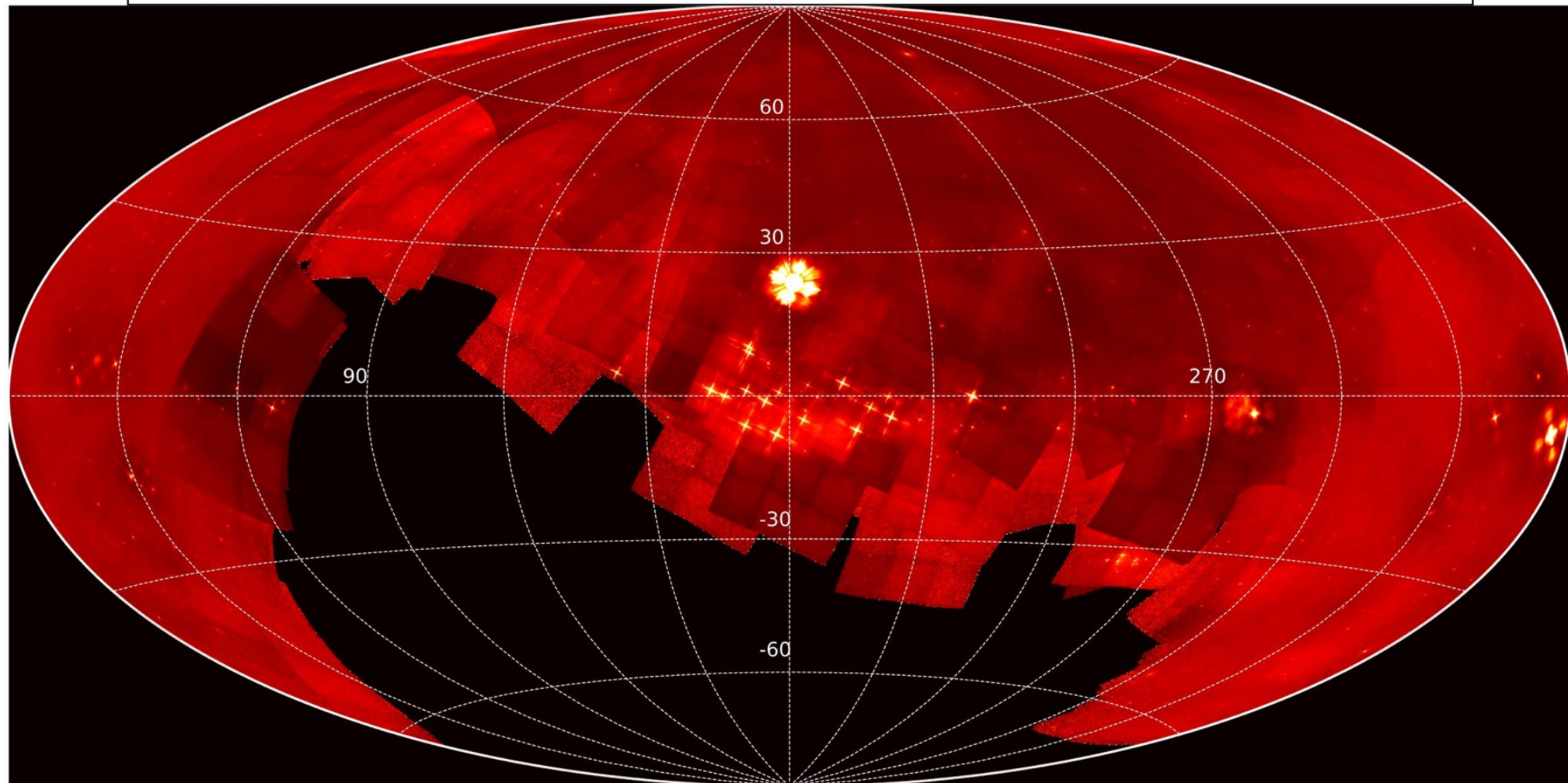


WFT and FXT meet requirements!

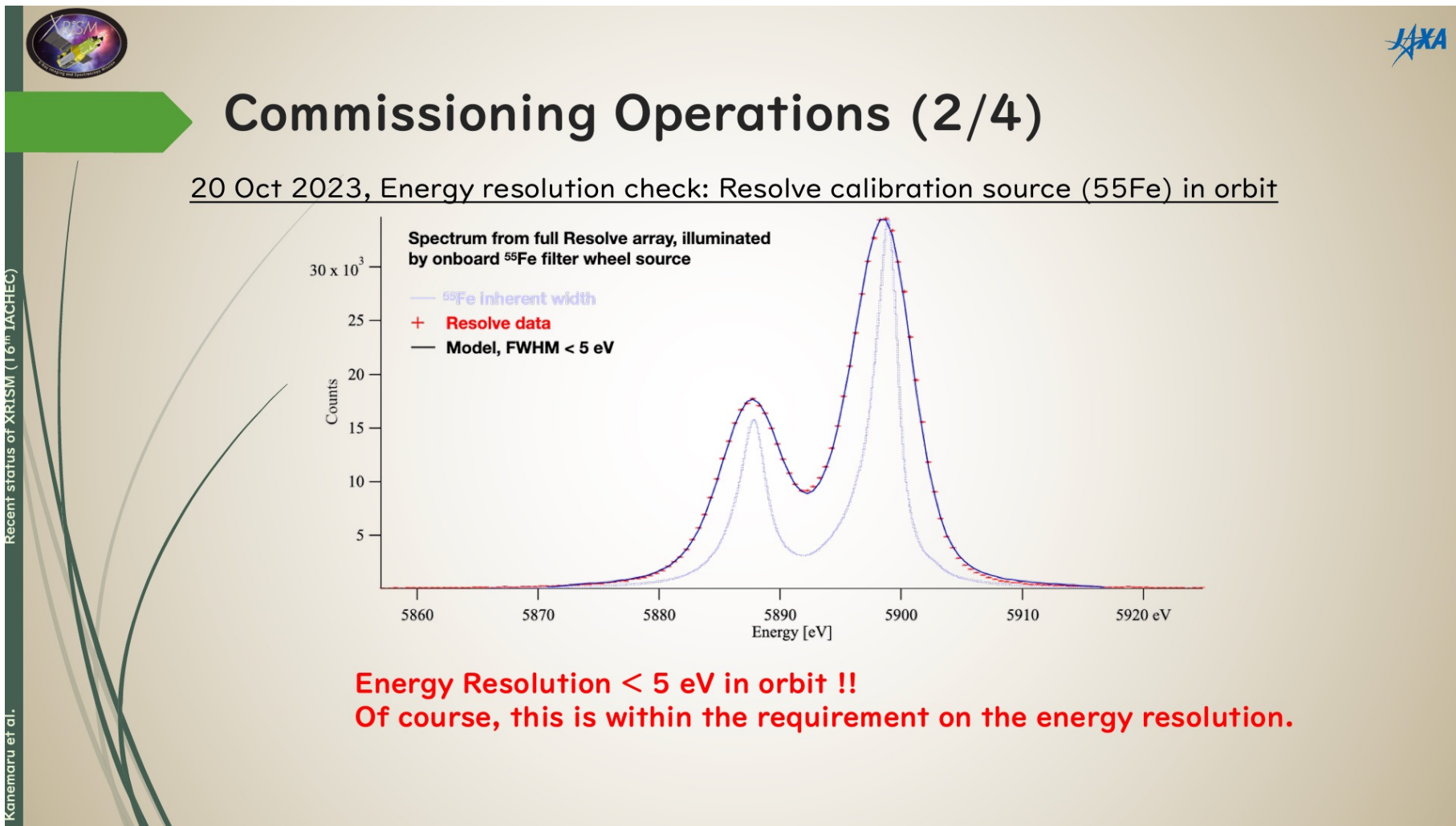


WFT and FXT meet requirements!

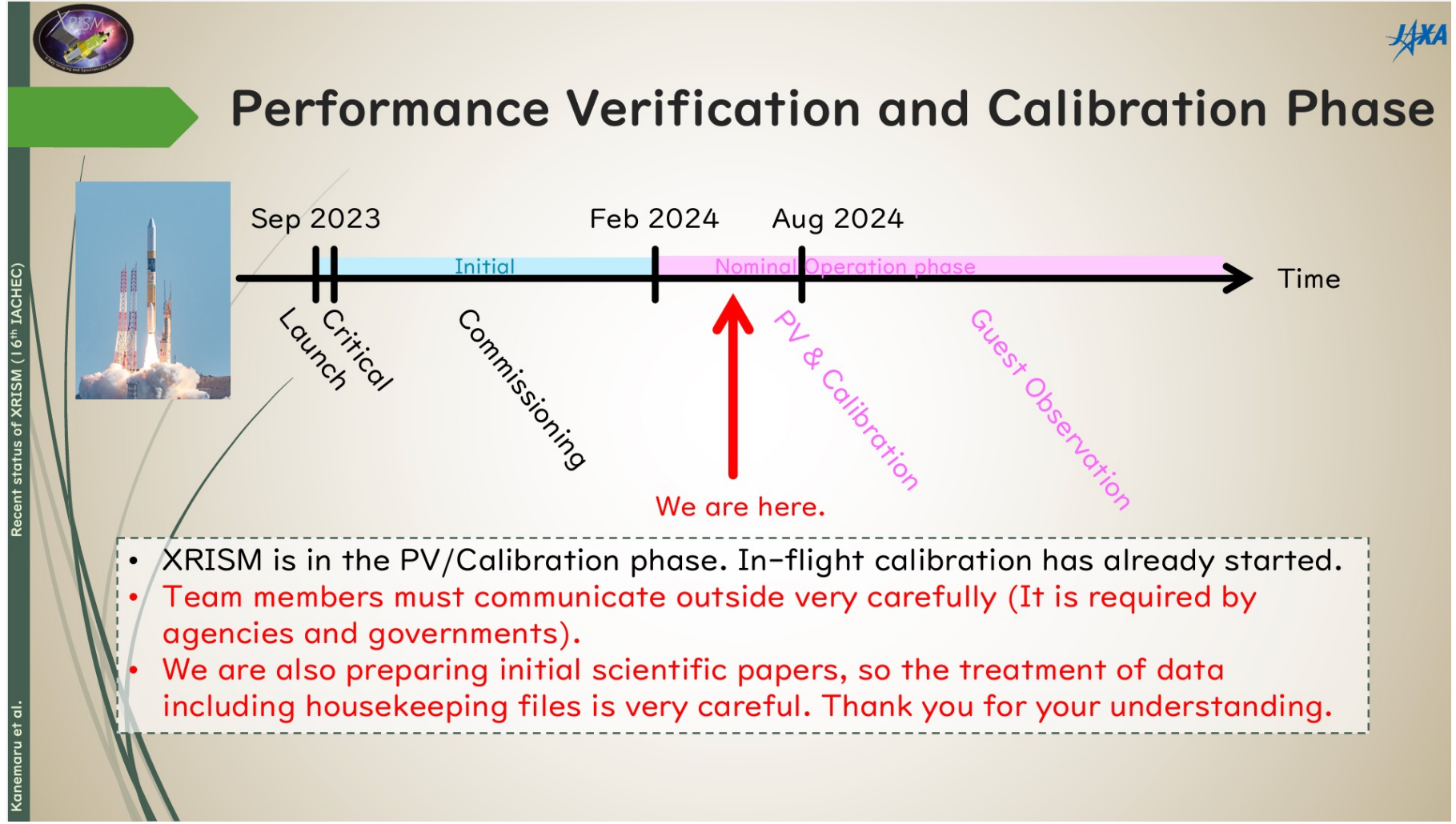
Soft X-ray sky in the eye of lobster (EP-WXT)



XRISM: Energy resolution meets requirements!



XRISM approaching GO



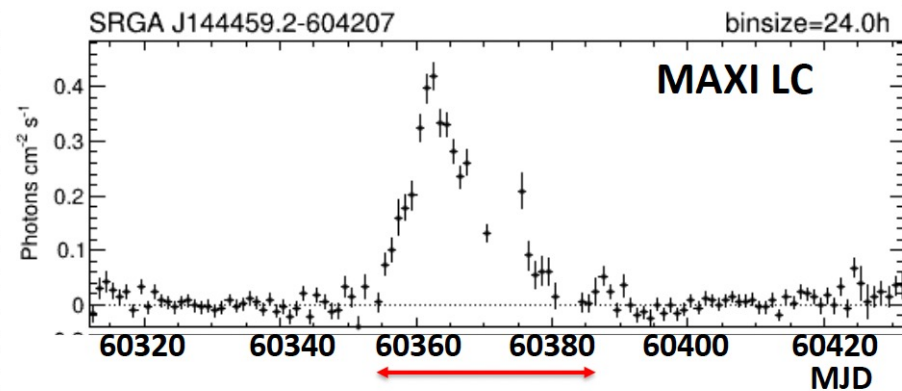
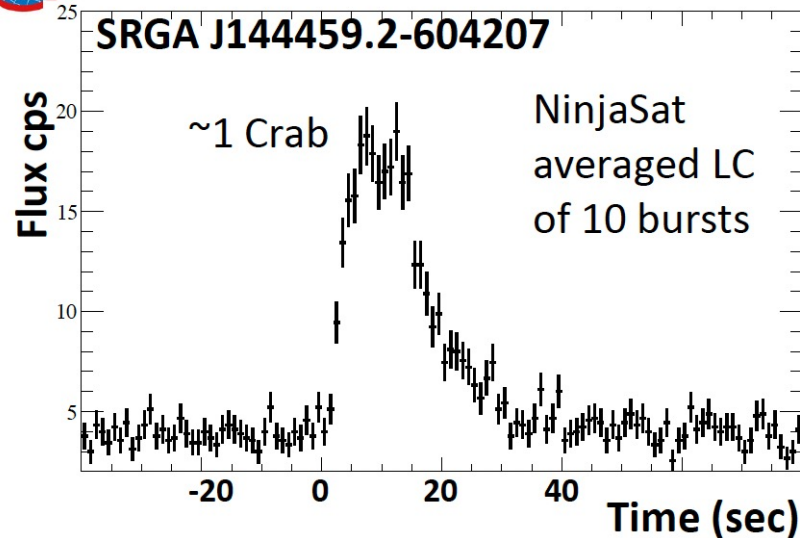
- XRISM is in the PV/Calibration phase. In-flight calibration has already started.
- Team members must communicate outside very carefully (It is required by agencies and governments).
- We are also preparing initial scientific papers, so the treatment of data including housekeeping files is very careful. Thank you for your understanding.

We appreciate that XRISM shared some more information and calibration data with us!

NinjaSAT indeed!



Scientific observations



- SRGA J144459.2-604207 (accreting millisecond pulsar)
- Observed many Type I XRBs.
- Monitored long-term ~1 month.
- Detection limit ~ sub-10 mCrab for 1/3 day observation

Targets observed so far.

- Crab
- **SRGA J144459.2-604207 (long-term)**
- Sco X-1
- Her X-1 (long-term)
- Cyg X-1
- 4U 0115+63
- GX 301-2



Integral

NuSTAR

XMM

Chandra

Swift

THEY DEPENDED ON EACH OTHER,
AND THE WORLD DEPENDED ON THEM.

BAND OF BROTHERS®

We salute you INTEGRAL

BAND OF BROTHERS

AstroSAT, Chandra, HXMT, INTEGRAL, IXPE, MAXI, Nicer, NuSTAR, Swift, XMM-Newton, eROSITA

We are the champions, my friends
And we'll keep on fighting 'til the end

No time for losers
'Cause we are the champions
Of the world!

Award for most innovative idea

EPIC-pn: Pos.3 + Pos.4: 56.5'

Sco X-1 offset 56.46 (No.3.4)
 4440_0934791534_PNS003
 Singles, 0.50 – 2.00 keV

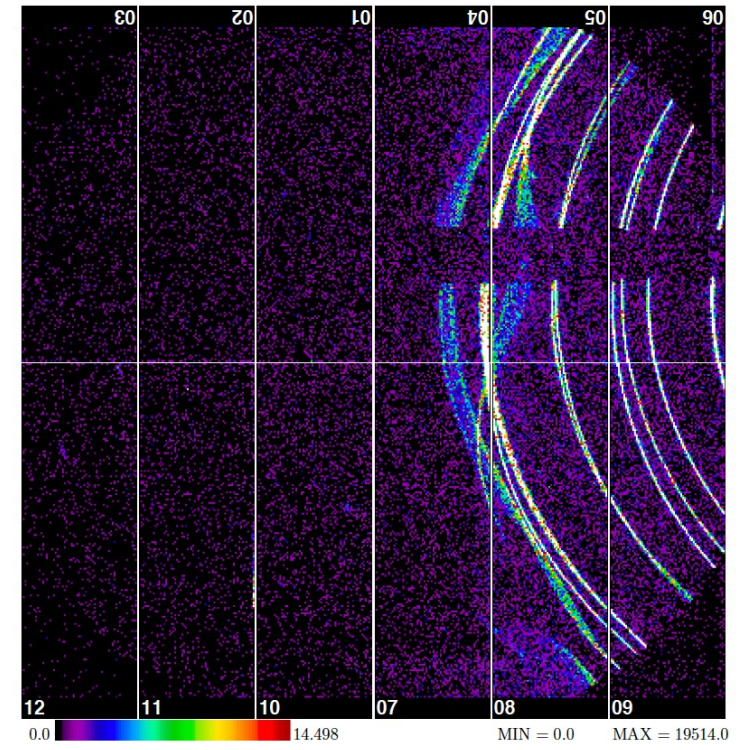
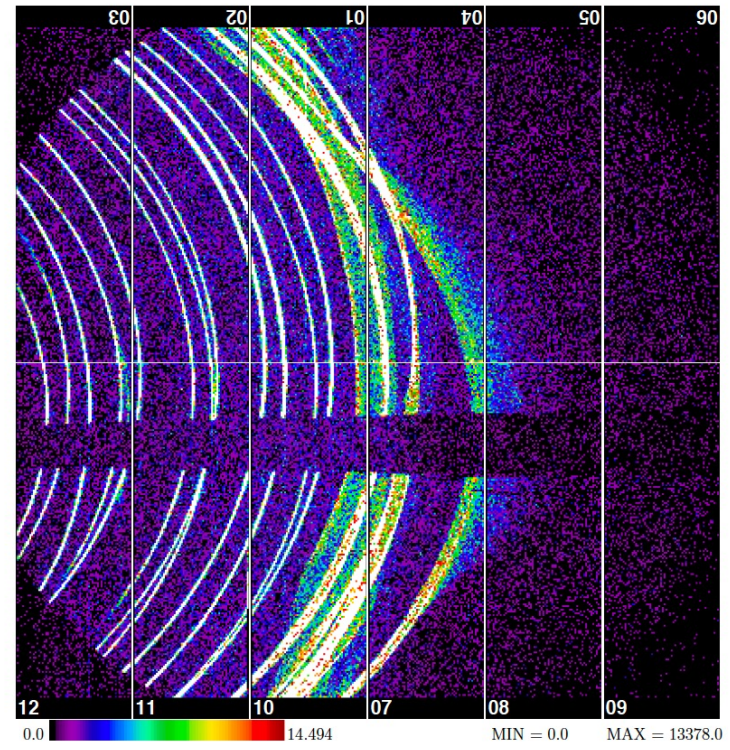
Mode = PrimeFullWindow Filter = Thick
 $\alpha_{2000} = 16\ 23\ 45.9$ $\delta_{2000} = -15\ 41\ 42.0$ PA = 98.722°
 $l = 359.692^\circ$ $b = 23.036^\circ$ $N_{H,gal} = 16.49 \times 10^{20} \text{ cm}^{-2}$

2024-03-07T08:37:51
 2024-03-07T10:38:38
 7247 s

Sco X-1 offset 56.49 (No.4.4)
 4440_0934792834_PNS003
 Singles, 0.50 – 2.00 keV

Mode = PrimeFullWindow Filter = Thick
 $\alpha_{2000} = 16\ 15\ 58.4$ $\delta_{2000} = -15\ 31\ 46.7$ PA = 98.722°
 $l = 358.517^\circ$ $b = 24.582^\circ$ $N_{H,gal} = 13.43 \times 10^{20} \text{ cm}^{-2}$

2024-03-08T00:46:10
 2024-03-08T02:46:59
 7249 s



After the meeting



Initiatives - 2023

Initiatives - 2023	Action	Status
Optics calibration special session in 15 th meeting – to become a WG?	Evaluate if we should form a WG	Didn't happen
Apply for ADAP and APRA funding for specific cross-calibration tasks	US specific	Did anyone do this?
Heritage: pursue HEASARC involvement	Talk to Keith Arnaud and Mike Corcoran	Done – but nothing more has happened
Create 'current activities' on the Webpage with easy access to IACHEC products	Started	Still needs updates
Advance papers	WG chair delegate tasks to members	
Co-chairs	Solicit help from members	2 new co-chairs: Megumi Shidatsu Craig Markwardt

Initiatives - 2024

Initiatives - 2024	Action
Optics calibration special session at next Workshop	Find out who will plan it
Apply for ADAP and APRA funding for specific cross-calibration tasks	US specific
Heritage WG resurrection	Execute “3c273 online”
Create ‘current activities’ on the Webpage with easy access to IACHEC products	Include links to background models
Advance papers	WG chair delegate tasks to members
IACHEC online for 3C273	Start regular meetings – resurrect Heritage WG for this effort

IACHEC WG procedures

- Setting yearly goals
- Pursue the yearly goals in a timely fashion
 - WG management
- **Write the IACHEC report early!**
- Inform the community of the progress
- Feedback from community
 - Involve members

HERDING CATS:

“A futile attempt to control that which is inherently uncontrollable.”



WG short term 2024 goals

WG	Goals - 2024
Detector & Background	<ul style="list-style-type: none">• Plan next year's topics• Update background information on wiki and provide links to the “current activities” page
Timing	<ul style="list-style-type: none">• Event FITS on Google Doc repository• Run IACHEC code (Matteo)• XRISM: tuning timing parameter• NuSTAR: apply latest clock correction table, dead time correction• NICER: change screening criteria• Update ‘barycen’ to use DE430 , or update ‘barycorr’ to apply Suzaku/Hitomi/XRISM
Clusters of Galaxies	<ul style="list-style-type: none">• Review eROSITA+XMM+Chandra temperature comparison• New paper on cluster Migas+2024 – have a discussion with authors• Provide data for Calstats WG concordance effort
High Resolution	<ul style="list-style-type: none">• XRISM Resolve vs. gratings

WG short term 2024 goals

WG	Goals - 2024
Calibration Statistics	<ul style="list-style-type: none">• Progress papers: Concordance paper #3; C-stat paper, Meng et al• Release MCCal; get instrument samples• Schedule interesting talks• Maintain library and update wiki: background
Thermal SNR	<ul style="list-style-type: none">• Two smaller groups; work on developing CasA and N132D models
Contamination	<ul style="list-style-type: none">• White paper draft complete by 2025
WD and INS	<ul style="list-style-type: none">• Get data from EP• Get data from SVOM
Non-thermal	<ul style="list-style-type: none">• Finish the L. Natalucci Crab paper<ul style="list-style-type: none">• Fall 2024 discuss advanced draft• Work on the Crab consolidated model<ul style="list-style-type: none">• Post model• Test model on other missions, reiterate

WG short term 2024 goals

WG	Goals - 2024
Coordinated Obs	<ul style="list-style-type: none">• Improve communications with new missions<ul style="list-style-type: none">• Continued calibration support across missions• January 2025 3c273 campaign
Heritage	<ul style="list-style-type: none">• Confirm heasarc commitment• Regular meetings on “3c273 online”

IACHEC workshop: Keeping the oral tradition alive



Motivate ourselves!

- Share stories
- Share experiences
- Pass on the stories to the next 'generation'

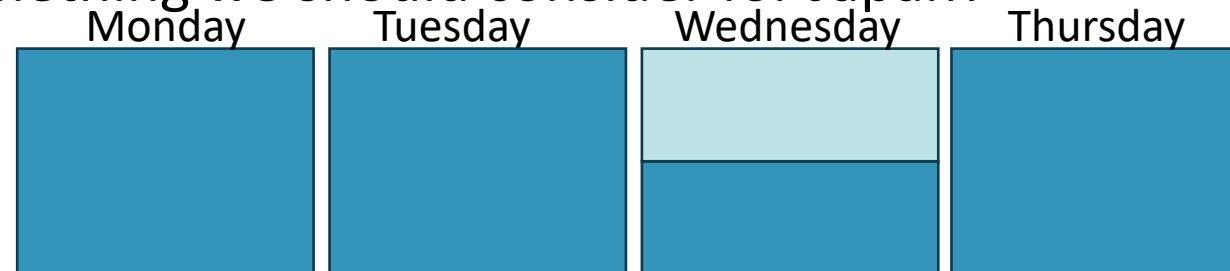
These are things that will not be captured by:

- Reports
- Papers
- Databases

2023 Meeting feedback -> 2024

- Longer breaks vs more talks
 - We achieved longer breaks and kept the same number of talks by having late dinner (9:30 – 19:30; 8:00 – 18:00)
- Half day (off or working session) in the middle with a full day Thursday

- Is this something we should consider for Japan?



- ~~Fewer talks -> posters?~~
 - ~~Many folks require to have a 'contribution' in order to attend a meeting~~
- What would YOU like?

Special Thanks to

Felix, Peter, and our sponsors:



JSPS



15th IACHEC Song

A few of our favorite things By Herman Marshall

Polishing mirrors was done so precisely
Chandra finds sources so very concisely.
X-rays are focused with unparalleled care
Finding fine details beyond all compare.

Trap maps and gain curves and in-flight cal sources,
Cross-calibration and statistics courses,
New background models in processing strings,
These are a few of our favorite things!

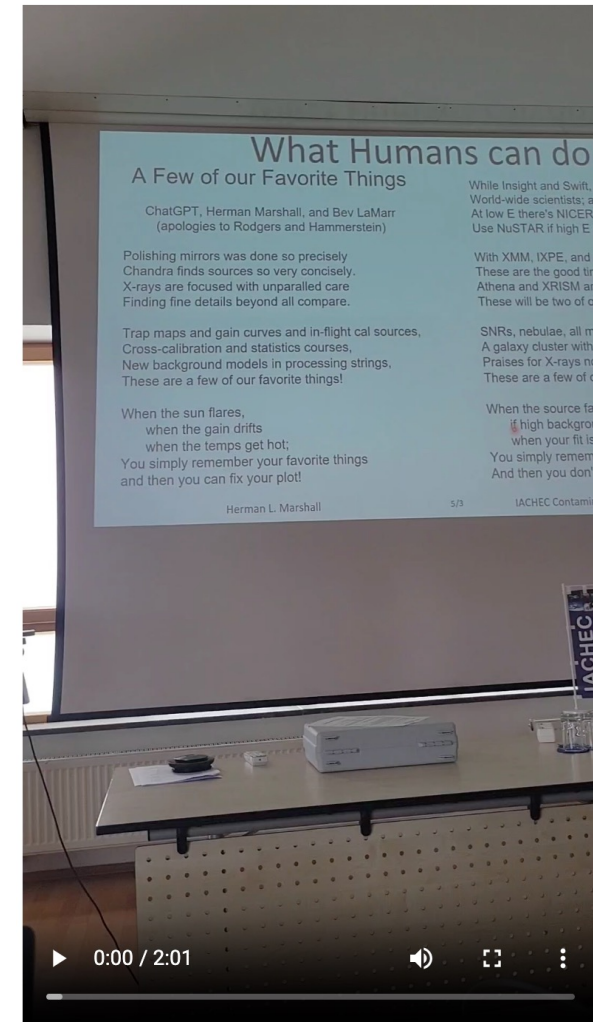
When the sun flares,
when the gain drifts
when the temps get hot;
You simply remember your favorite things
and then you can fix your plot!

While Insight and Swift, eROSITA exposing,
World-wide scientists; all are proposing.
At low E there's NICER with count rates galore,
Use NuSTAR if high E you want to explore.

With XMM, IXPE, and Integral flying,
These are the good times for us — no denying.
Athena and XRISM are part of our hopes,
These will be two of our favorite 'scopes!

SNRs, nebulae, all matched with Hubble,
A galaxy cluster with inflated bubble;
Praises for X-rays now everyone sings,
These are a few of our favorite things!

When the source fades,
if high background,
when your fit is bad;
You simply remember your favorite things
And then you don't feel so sad!!



Video on
webpage!

16th IACHEC Song

Lyrics modified by Peter

With help from: Matteo, Baerbel, Felix, Kristin

Played by the IACHEC court bard: Matteo Bachetti

16th IACHEC Song: Hotel Calibration

On a dark starry highway
 Hot winds in my hair
 Warm smell of hydrazine
 Rising up through the air
 Up ahead in the distance
 I saw a shimmering light
 Contamination made my sight grow dim
 I had to stop for the night

There she stood in the doorway
 I knew the mission well
 And I was thinking to myself
 "This could be Heaven or this could be Hell"
 Lighting her standard candle
 Then she showed me the way
 There were voices down the corridor
 I thought I heard them say:

Welcome to the Hotel Calibration
 Such a lovely place (Such a lovely place)
 Such a lovely face
 Plenty of room at the Hotel Calibration
 Any time of year (Any time of year)
 You can find me here

Her mind's statistic'ly twisted
 She got a good Concordance, uh
 She got a lot of nerdy, nerdy boys
 That she calls friends
 How they meet at the IACHEC
 Sweet summer sweat
 Some meet to remember
 Some meet to forget

So I asked (the) IACHEC chair
 "Please show me the tricks"
 She said, "We haven't had much progress yet
 Since two thousand and six"
 And still those photons are comin'
 From far away
 Wake you up in the middle of the night
 Just to hear them say

"Welcome to the Hotel Calibration
 Such a lovely place (Such a lovely place)
 Such a lovely face
 They're livin' it up at the Hotel Calibration
 What a nice surprise (What a nice surprise)
 Bring your alibis"

Mirrors off their axis
 All results on ice, and she said
 "We are all just prisoners here
 Of our own device"
 And in the fitting chambers
 They gathered for the feast
 They stab it with their iron lines
 But they just can't kill the beast

Last thing I remember, I was
 Running for the door
 I had to find the passage back
 To the fit I had before
 "Relax," said the archives
 "We are programmed to receive
 You can check out any time you like
 But you can never leave"

Welcome to the Hotel Calibration
 Such a lovely place (Such a lovely place)
 Such a lovely face
 Plenty of room at the Hotel Calibration
 Any time of year (Any time of year)
 You can find me here