

# Coordinated Observations WG

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4/22/15

# Working Group Objectives

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- ❖ General
  - ❖ Coordinate new joint observations
  - ❖ Analyze joint observations
  - ❖ Publish results
- ❖ Today
  - ❖ Status of cross-cal projects
  - ❖ Planning for new coordinated observations

# Agenda for IACHEC 11

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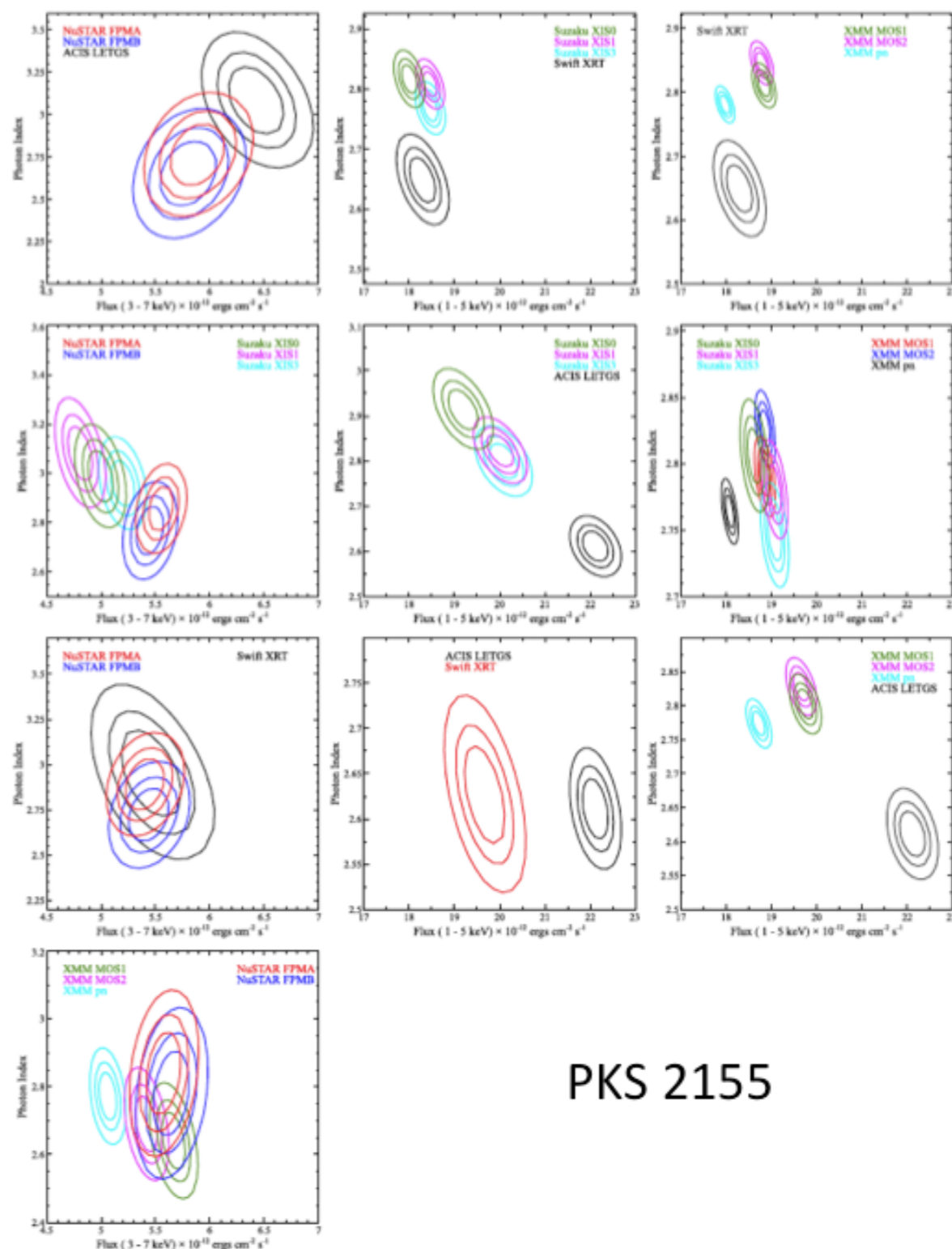
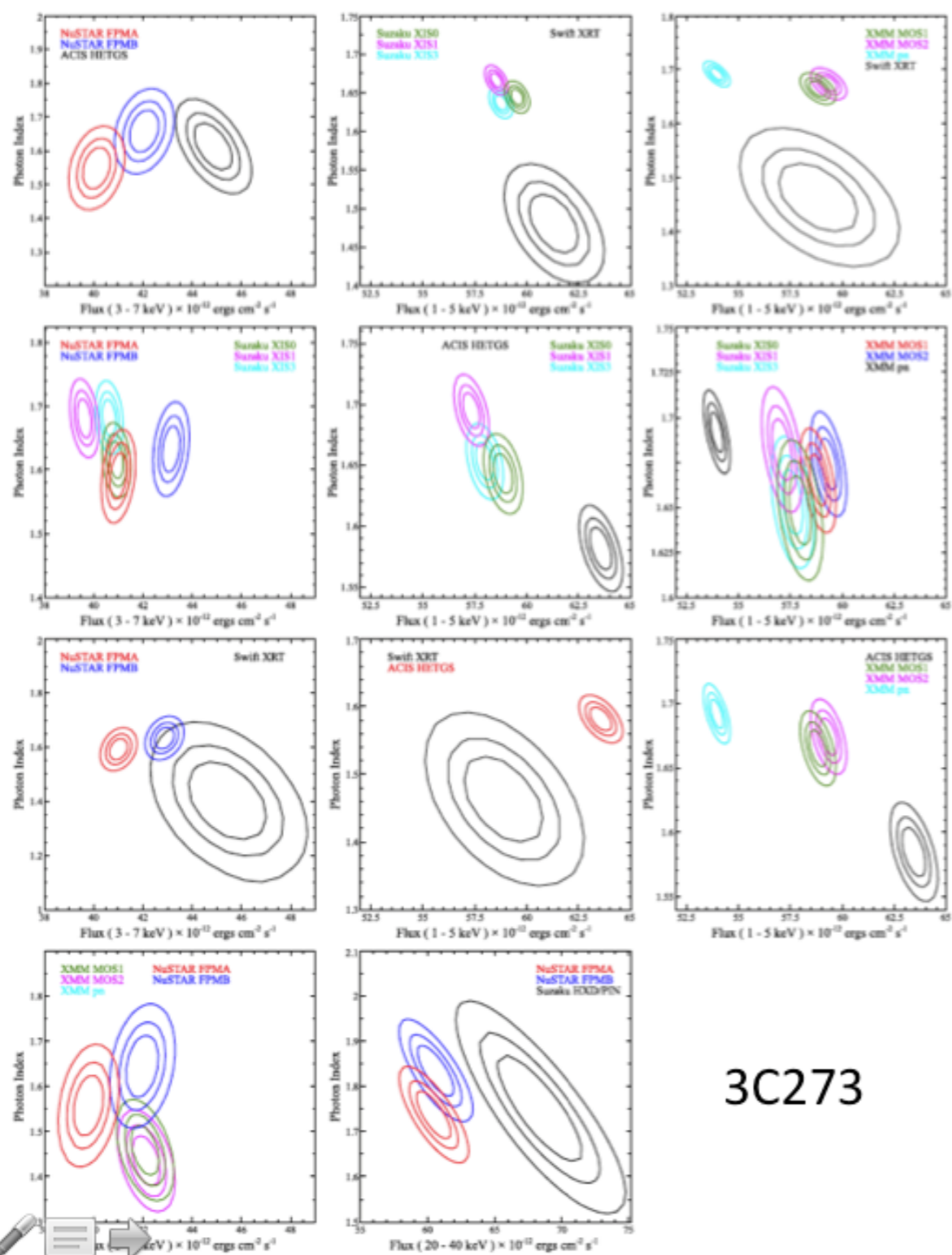
- ❖ Overview (HLM): 11:15
- ❖ Cross-cal in 2012, 2013 (KKM): 11:20
- ❖ XMM/Chandra blazar project (MS): 11:50
- ❖ Cross-cal in 2014, 2015 (who leads?): 12:00
- ❖ Astrosat cross-cal in 2015, 2016 (DB): 12:10
- ❖ Hitomi cross-cal in 2016 (MG): 12:20
- ❖ HXMT cross-cal in 2016-7 (SX): 12:40

# Status of Current Projects — 1

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- ❖ PKS 2155 and 3C 273 with NuSTAR and others
  - ❖ K. Madsen lead, others involved
  - ❖ First round of results now available, see KKM's presentation
  - ❖ Support: HLM (Chandra LETGS, HETGS), JK (Swift), EM (Suzaku), MSt (XMM pn & MOS) — each must review mission-specific results
  - ❖ Paper near completion — details discussed

# Plots for tables



# Status of Current Projects — 2

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- ❖ XMM/Chandra blazar sample
  - ❖ M. Smith leads, analyzed with standard data and tools
  - ❖ H. Marshall verified Chandra fluxes
  - ❖ Draft a paper after verification — no waiting for cal updates
  - ❖ PSF correction uncertainty appeared — continue!

# Status of Current Projects — 3

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- ❖ April 2014: PKS 2155
  - ❖ Swift, NuSTAR, Chandra LETGS, XMM, Suzaku
- ❖ Late June 2015: 3C 273
  - ❖ Swift, NuSTAR, Chandra HETGS, XMM
- ❖ Analysis leads not yet identified
- ❖ Next: 3C 273 in June 2016 with Hitomi, Chandra, XMM, Astrosat, NuSTAR...

# Upcoming Mission Planning

	Launch	Cal/PV	Sources	Science Contact	Scheduler
Astrosat	9/15	10/15 -4/16	Crab, Cen A Cyg X-1, 3C 273	Depankar Bhattacharya	
Hitomi	2/16	3-5/16	TBD	Rob Petre/ Matteo Guainazzi	
POLAR	9/16				
HXMT	11/16	10/16 -1/17	TBD	Shaolin Xiong	
NICER	9/17	8-9/16	3C 273 Mk 421	Craig Markwardt	
eROSITA	9/17	10-12/17	TBD	Vadim Burwitz	Jan Robrade



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## Coordinated Observations

### Astrosat with other missions

#### *Scheduled via TOOs*

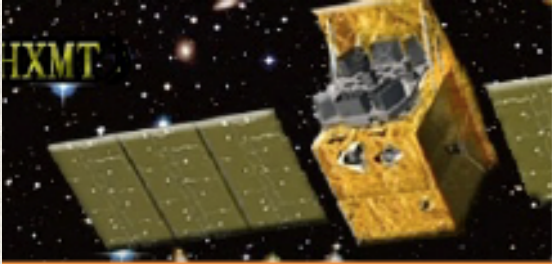
- Oct 06: SWIFT Crab (1 ks) [CZTI]
- Oct 07: SWIFT Cyg X-1 (1 ks) [CZTI]
- Oct 07-08: NuSTAR Cyg X-1 (20 ks) [CZTI]
- Oct 31: SWIFT PKS 2155-105 (5 [1.2] ks) [SXT, LAXPC, CZTI]
- Nov 13: NuSTAR Cyg X-3 (10 ks) [CZTI, LAXPC, SXT]
- Nov 14: NuSTAR GRS1915+105 (10 ks) [CZTI, LAXPC, SXT]

#### *Already existing schedule adjusted for Astrosat coordination*

- Oct 10, 12-17: INTEGRAL Crab (45 ks, 455 ks) [CZTI, SSM]
- Nov 14-15: INTEGRAL Cyg X-1 (86 ks) [CZTI, LAXPC, SXT]

Hitomi proposed **high priority**/**best-effort** basis  
coordinated calibration observations

Source	Scope	Coordination	Schedule
<b>3C273</b>	Effective area	<b>IACHEC</b>	~Jun/Jul 16
<b>Capella</b>	SXS gain/LSF	<b>Chandra/XMM-N</b>	~Mar 16 or ~Sep 16
<b>Centaurus A</b>	Effective area	<b>INTEGRAL/Swift/ NuSTAR</b>	~Jun/Jul 16
<b>Crab</b>	Timing	<b>INTEGRAL/Swift/ XMM-Newton</b>	~Mar 16 or ~Sep 16
<b>CygX-1</b>	Effective area	<b>INTEGRAL/ NuSTAR/Swift</b>	~Apr 16
<b>PSR0540-69</b>	Timing	<b>Swift</b>	~Apr 16



# List of In-flight Calibration Sources

Source Name	RA	DEC	Usage
Crab	83.63	22.01	RMF, ARF, Timing, PSF, boresight, etc.
PSR B1509-58	228.48	-59.14	
Cas A	350.846	58.813	Data analysis, LE temperature drift
Tycho	6.334	64.150	
Cyg X-1	299.59	35.20	Data analysis, quick-look
Sco X-1	244.98	-15.64	
Mrk421	166.11	40.09	
Blank Sky #1	145.9975	4.3899	Background  (include: night Earth)
Blank Sky #2	176.4366	-20.6326	
Blank Sky #3	232.5356	8.8014	
Blank Sky #4	251.8799	55.7135	
Blank Sky #5	322.4055	-24.2587	
Blank Sky #6	52.6687	-59.8347	
Blank Sky #7	312.2388	-11.8415	
Blank Sky #8	22.5767	-76.1370	

- Other (IACHEC) sources?
- HXMT Initial Calibration phase: 2016.12 – 2017<sup>7</sup>.2 (TBC)

# Action Items

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1. HLM: poll projects to complete table of contacts and post cal observation plans, find leads for analysis of 2015, 2015 obs'ns
2. MS & HLM: complete XMM/Chandra blazar paper
3. KKM: contacts co-authors for flux verification (list is almost set)
4. LN: contact Fermi project for new rep
5. HLM: develop contact scientist e-mail list
6. CM: coordinated observation planning tool
7. HLM & RP: examine Astro-H target list for candidate campaigns