“慧眼”-HXMT卫星亮点
Highlights of the *Insight*-HXMT satellite

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on behalf of the *Insight*-HXMT team
代表 “慧眼”-HXMT团队 hxmt.cn

Institute of High Energy Physics（高能所）
Chinese Academy of Sciences（中科院）

Institute of High Energy Physics (IHEP)

1. Experimental Physics Division
2. Accelerator Division
3. Particle Astrophysics Division
4. Multi-disciplinary Research Division
5. Division of Nuclear Technology and Applications
6. Theoretical Physics Division
7. Computing Center

Total fulltime permanent staff: ~1500

Beijing Electron-Positron Collider

Particle Astrophysics Division

Fulltime permanent staff: 180

Director: Shuang-Nan Zhang

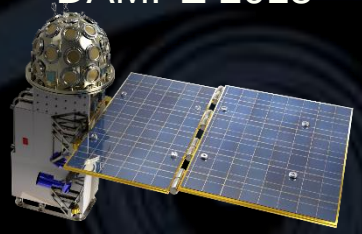
China's Space High Energy Astrophysics Missions

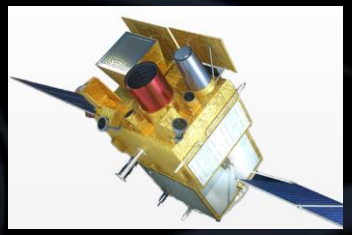
- ✓DAMPE (2015)
- ✓*POLAR (2016)
- ✓**Insight*-HXMT (2017)
- ✓*GECAM (2020)
- ✓SVOM (2022)
- ✓EP (2022)
- ✓*POLAR-2 (2024)
- ✓*eXTP (2027?)
- ✓*HERD (2025?)

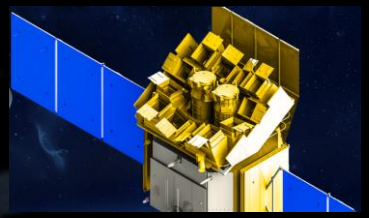

DAMPE 2015

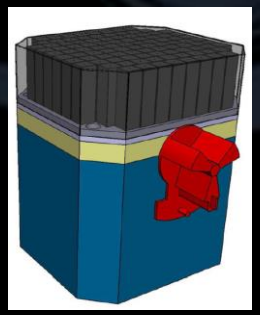

*POLAR 2016

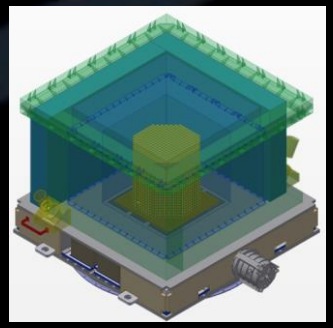

*HXMT 2017


*GECAM 2020


SVOM 2022


EP 2022


*POLAR-2 2024

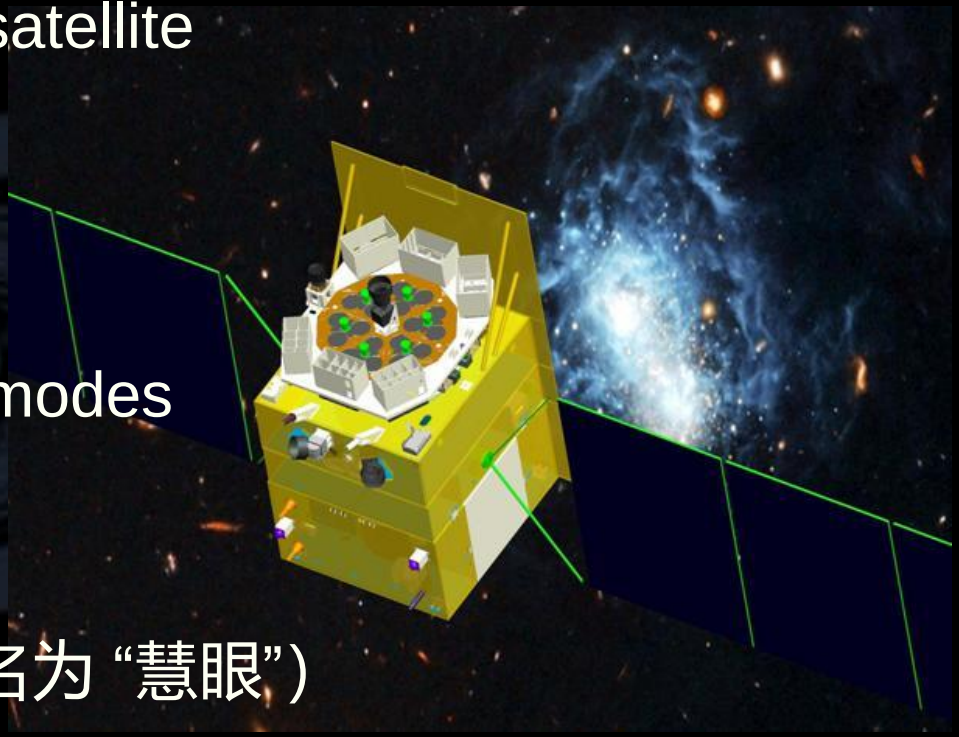

*HERD 2025?


*eXTP 2027?

*IHEP the PI institution

Hard X-ray Modulation Telescope (HXMT) satellite
硬X射线调制望远镜（HXMT）卫星

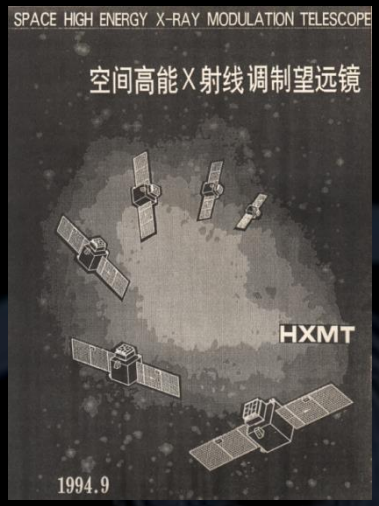
- China's 1st X-ray astronomy satellite
- Selected in 2011
- Total weight ~2500 kg
- Cir. Orbit 550 km, incl. 43°
- Pointed, scanning and GRB modes
- Designed lifetime 4 yrs
- Launched on June 15th, 2017
- Dubbed "*Insight*"（发射后命名为 "慧眼"）



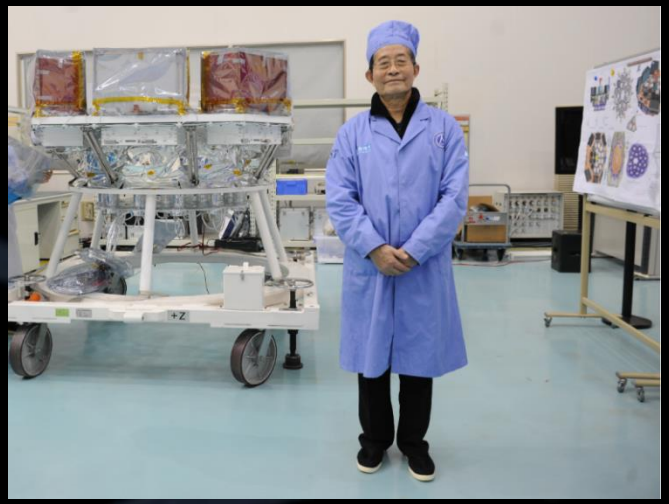
Zhang, S.-N. et al. Overview to the Hard X-ray Modulation Telescope (Insight-HXMT) Satellite. Science China Physics, Mechanics, and Astronomy 63, 249502 (2020)

History of 慧眼*Insight*-HXMT

1970-80s balloon flight



1993 first proposal，2011 funded



李惕碚院士Prof. Ti-Pei Li

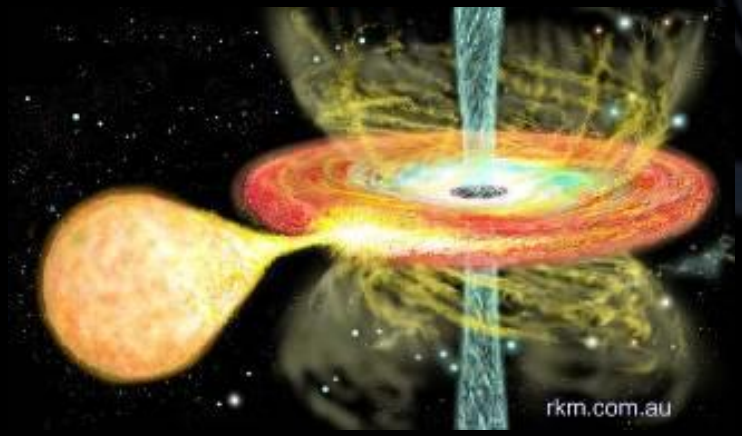
In honor of
何泽慧 Ho Zah-wei (1914-2011)
“慧眼” *Insight*

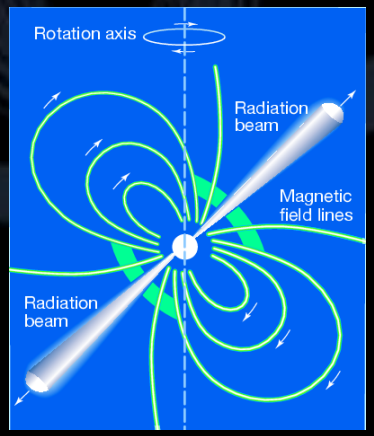
2017.6.15 Launched in Jiuquan, China

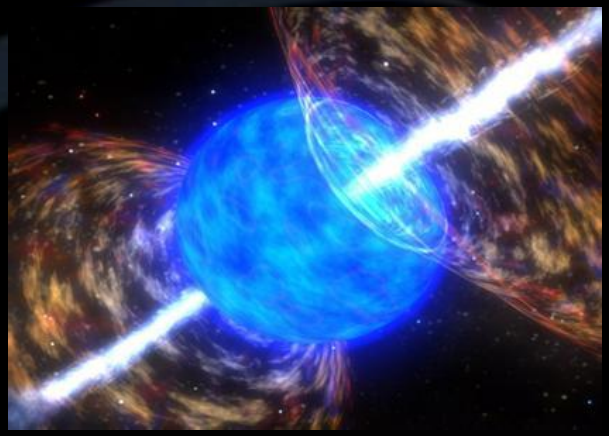
第一届空间科学大会“慧眼”新成果发布
Press Release of Insight-HXMT Results

Core sciences核心科学

- ✓ Galactic plane scan and monitor survey for more weak & short transient sources in very wide energy band (1-250 keV)
- ✓ Pointed observations: High statistics study of bright sources and long-term high cadence monitoring of XRB outbursts
- ✓ All sky monitor for GRBs & pulsars (0.2 – 3 MeV)





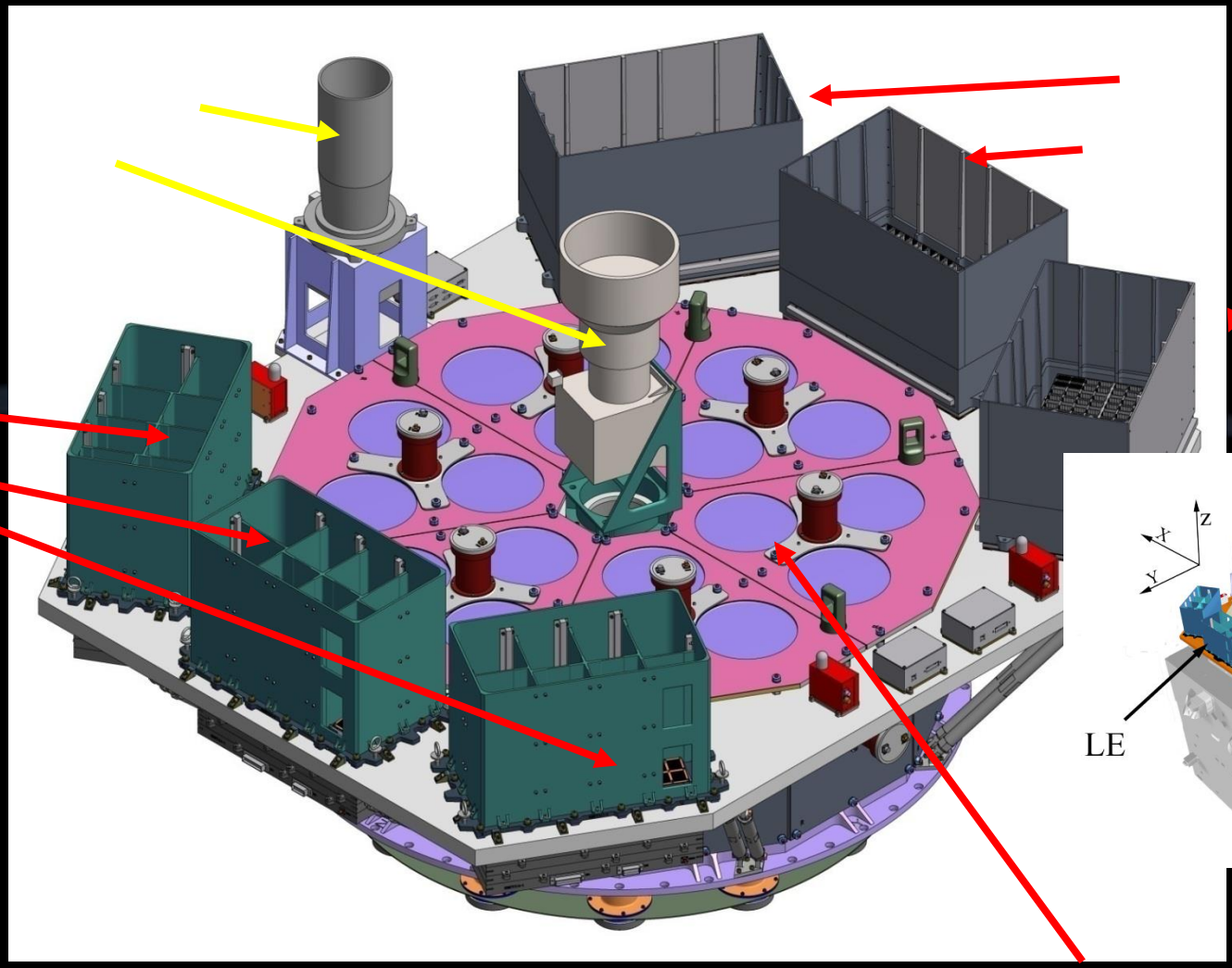


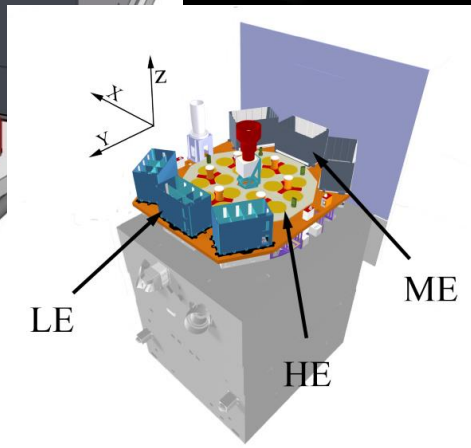
Science payload科学载荷

Star tracker

LE:SCD,1-15 keV, 384 cm^2

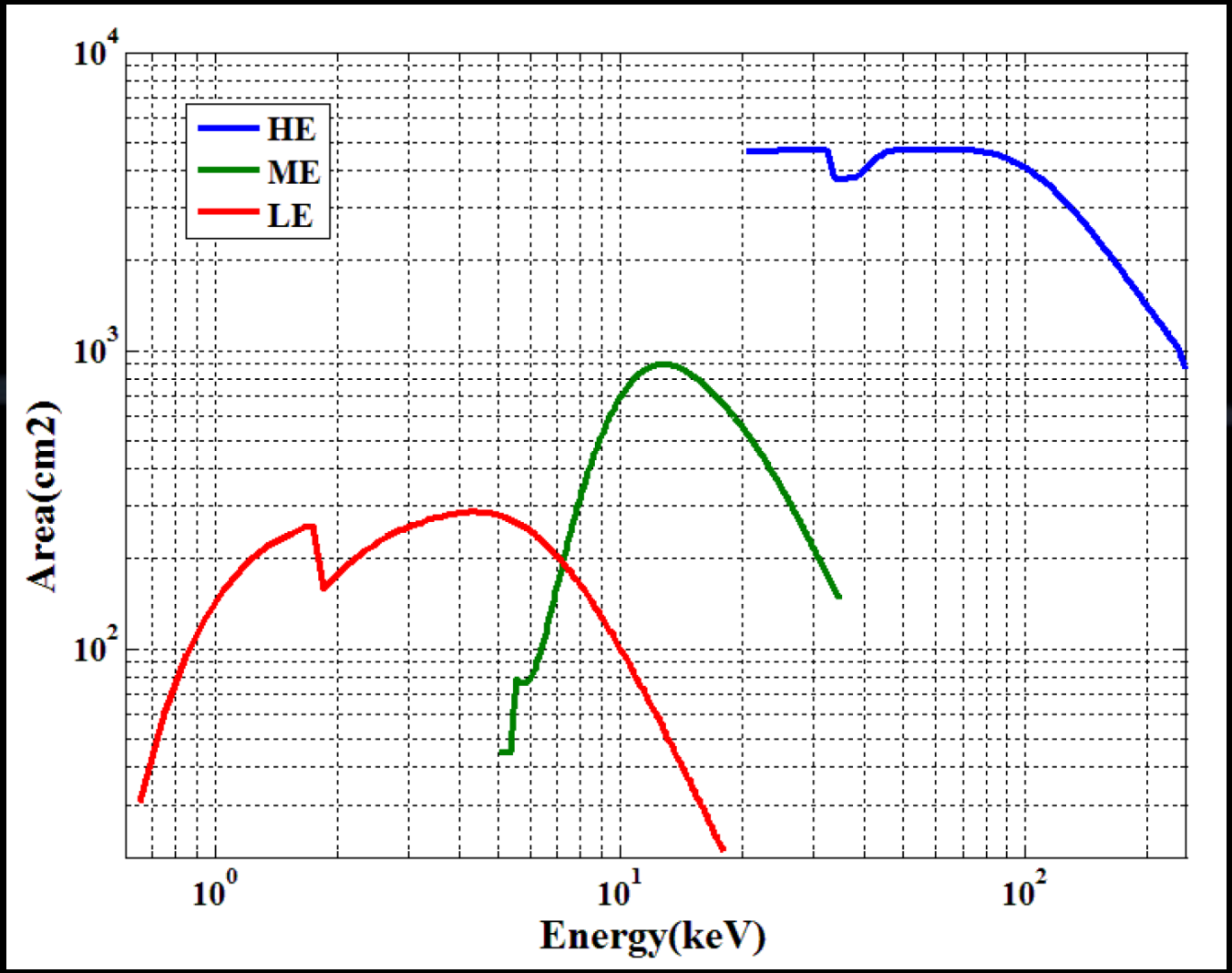
ME:Si-PIN,5-30 keV, 952 cm^2



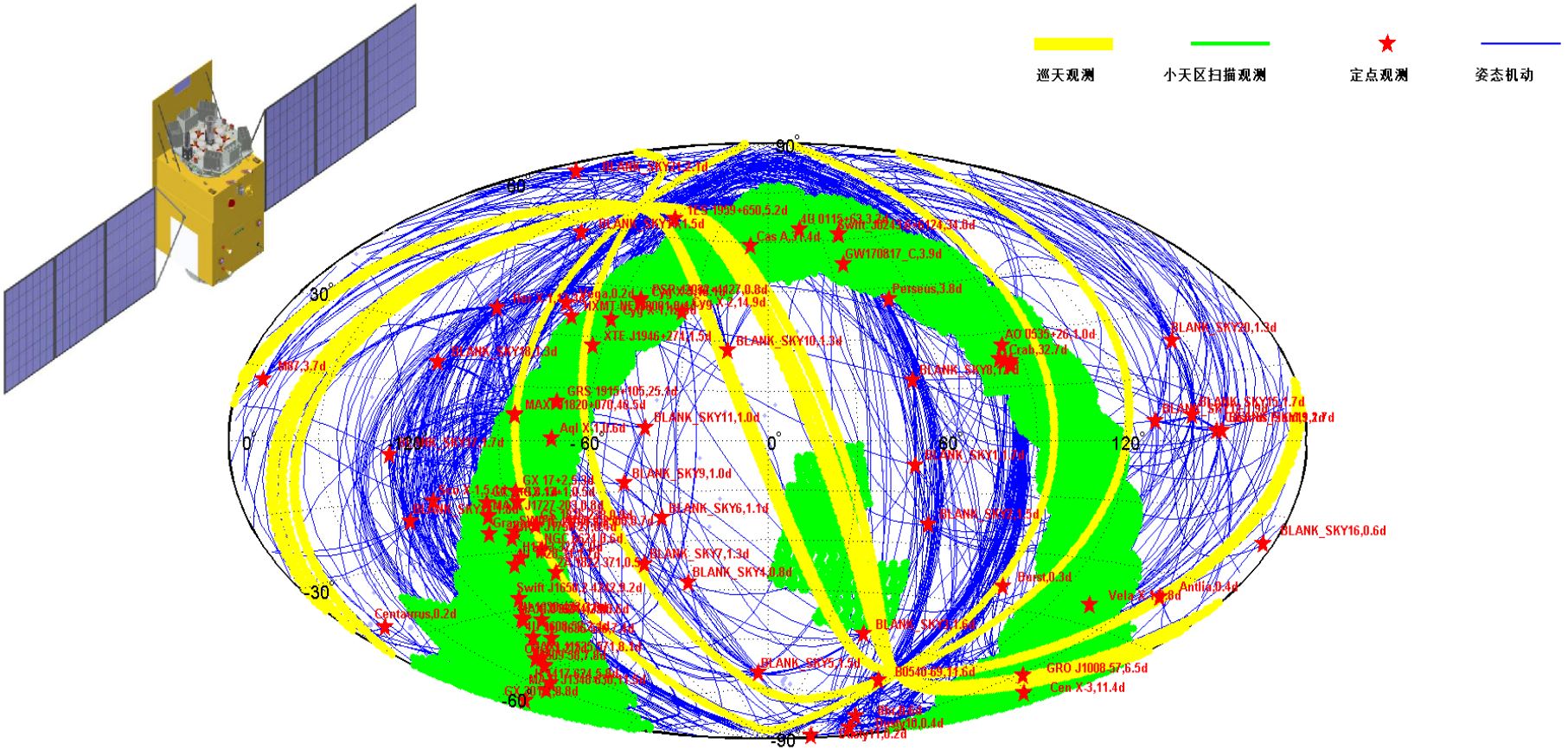


HE: NaI/CsI, 20-250 keV, 5000 cm^2

Effective area有效面积



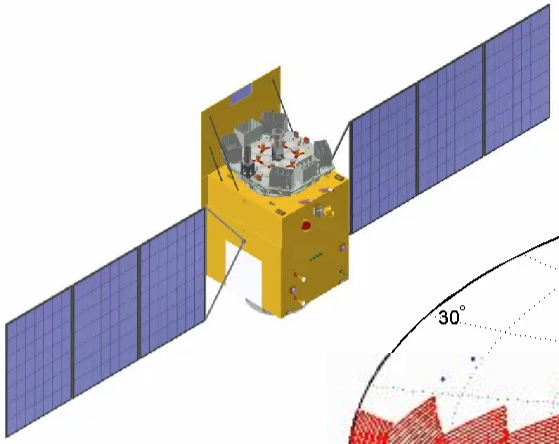
曝光天图Exposure Map



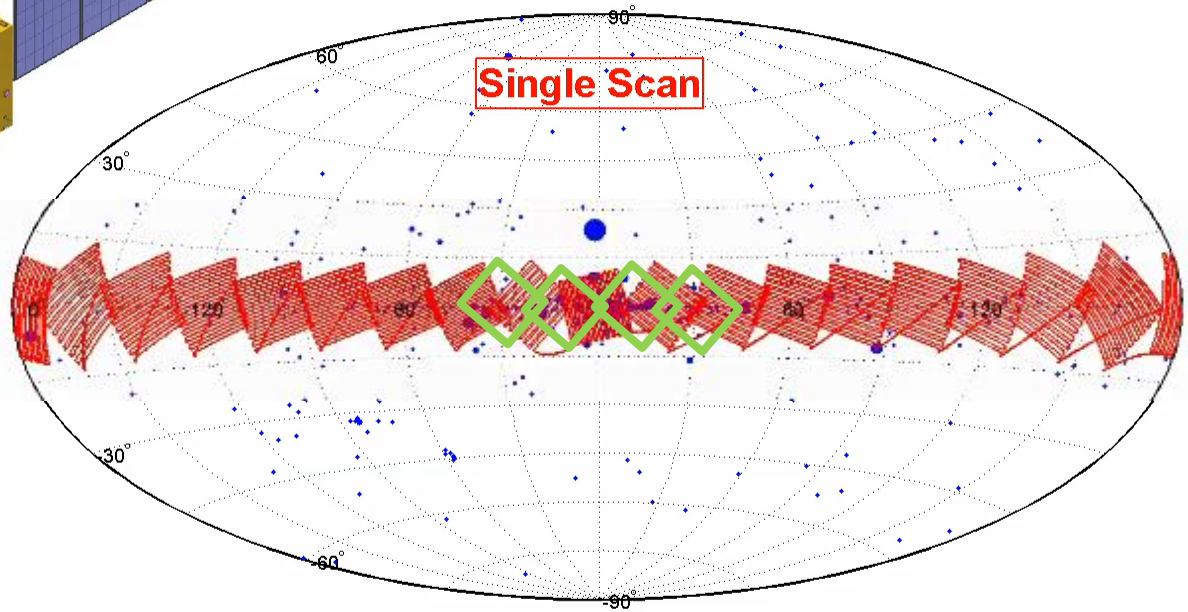
Red stars: pointed observation

Green regions: small area scan

Insight-HXMT scanning survey of the MW
“慧眼”对银道面的扫描巡天



Single scan sensitivity: 3-10 mCrab
(spectral shape dependent)



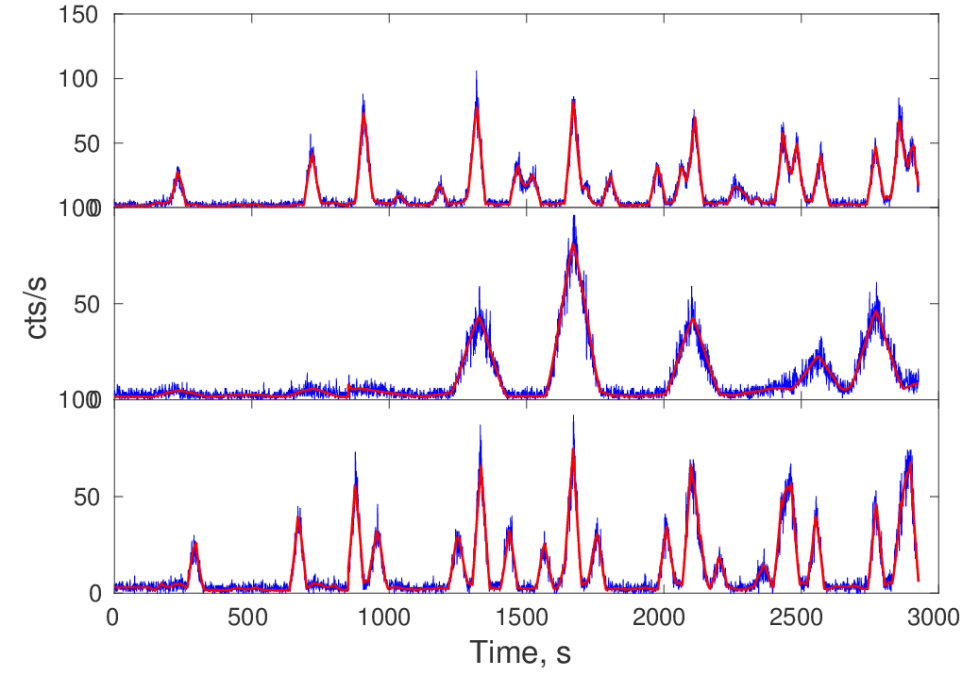
Galactic Plane: (20°*20°)*18 + (20°*20°)*4

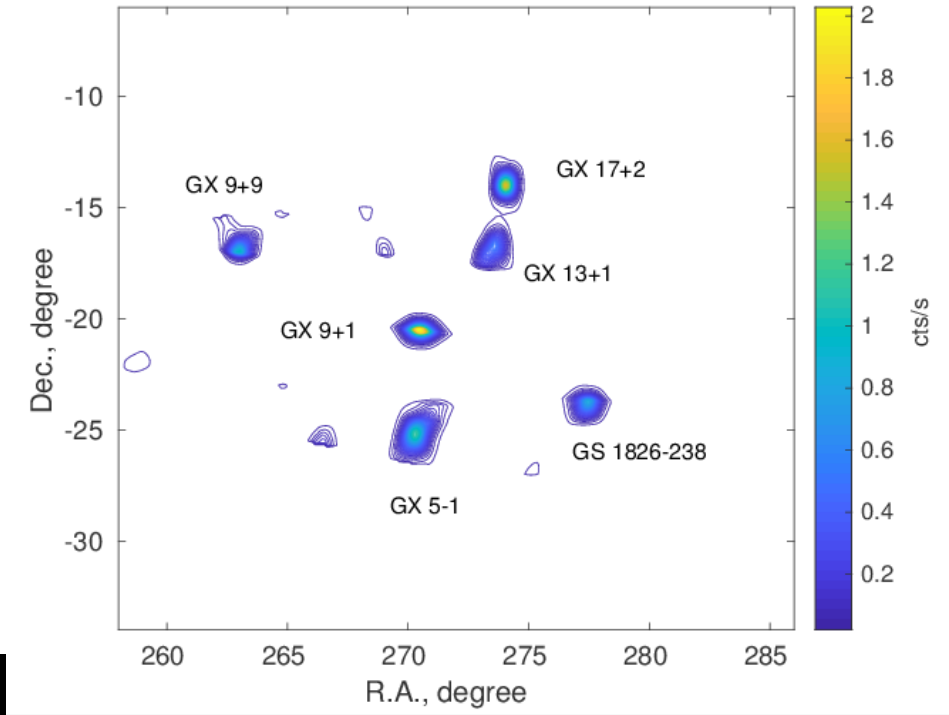
- 11 center regions: 90 times/year (-60°~60°), 11 outer regions: 10 times/year

Sai, N. et al., 2020

Scan light curve & reconstructed image
扫描光变曲线和重建的图像

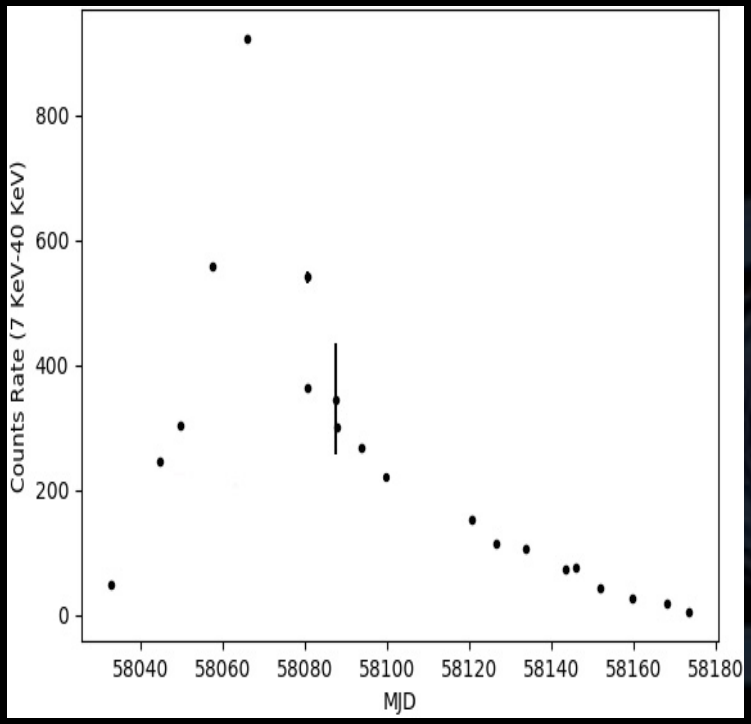
July 16 on Galactic center (LE 1-6 keV)





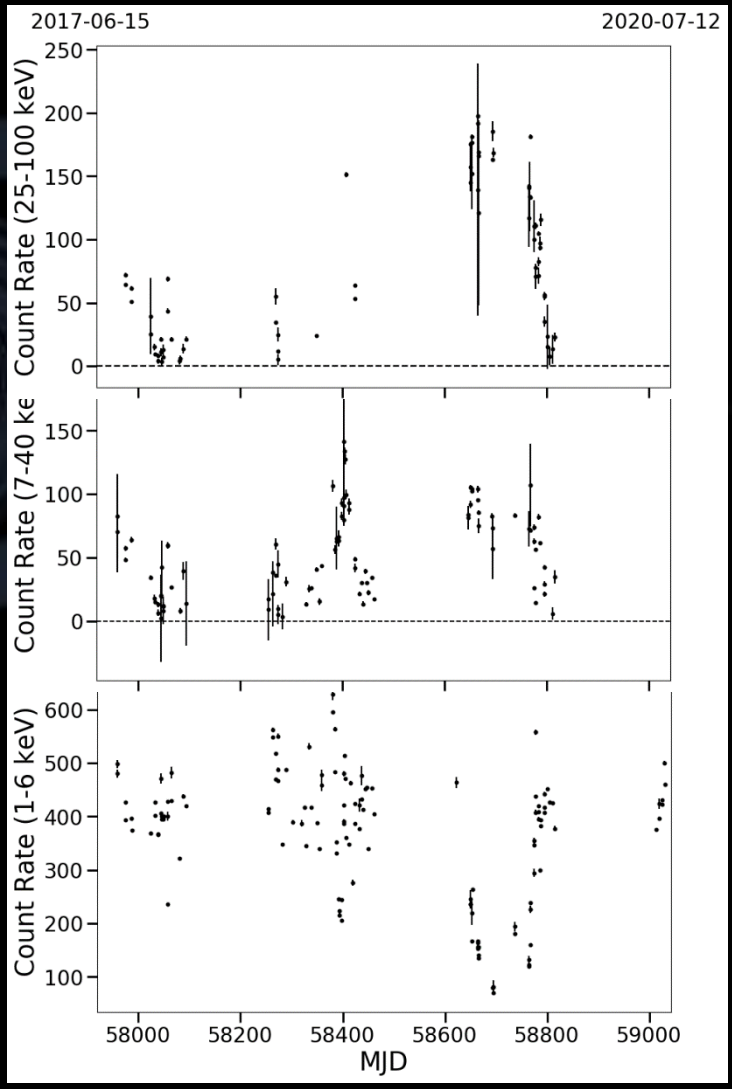
Direct Demodulation Method (Li & Wu 1993); Guan, J. et al., 2020

Long-term monitoring of ~200 sources
大约200个天体长期X射线光变曲线监测



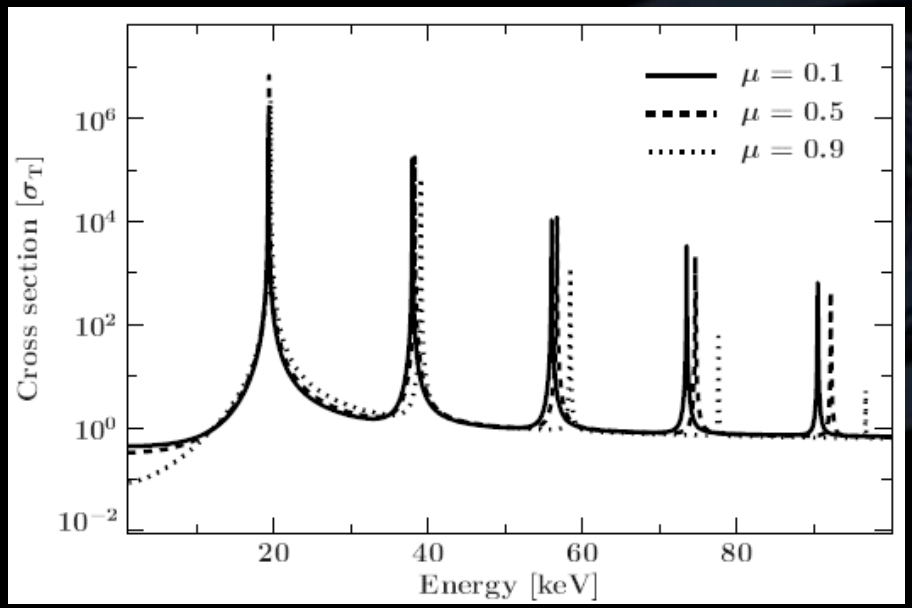
ME (7-40 keV):
Swift J0243.6+6124,
Accreting pulsar

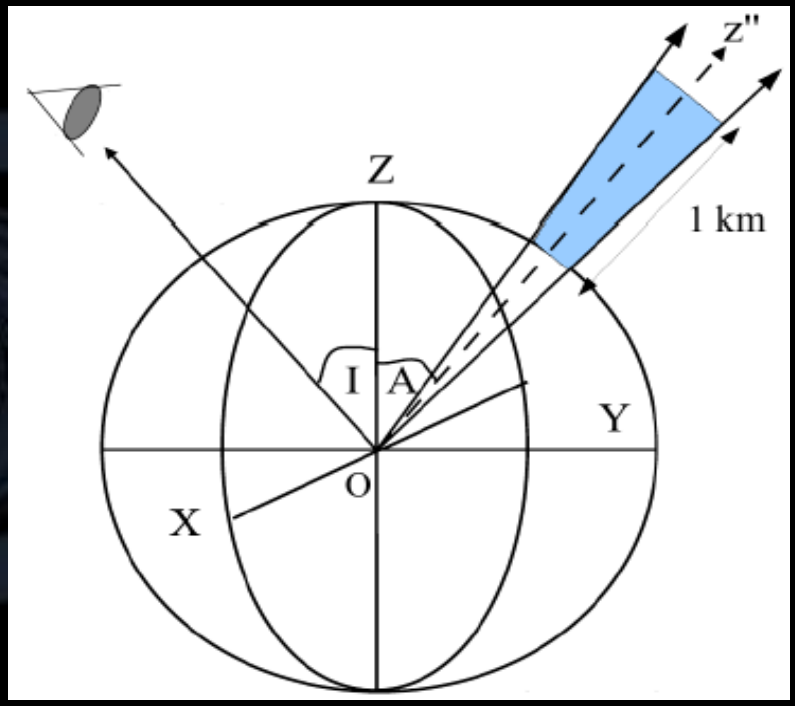
1-250 keV: Cyg X-1, accreting BH



Extreme Magnetism near Neutron Stars
中子星附近有宇宙最强磁场

$$E_n = (m_e c^2)\frac{\sqrt{1 + 2n\frac{B}{B_{crit}}\sin^2\theta} - 1}{\sin^2\theta} \times \frac{1}{1+z}$$

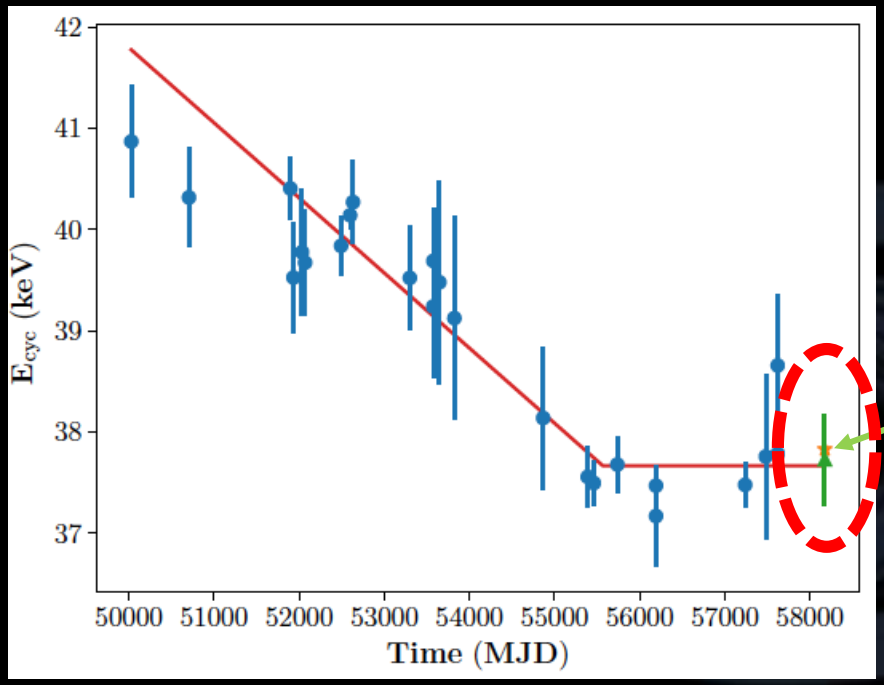


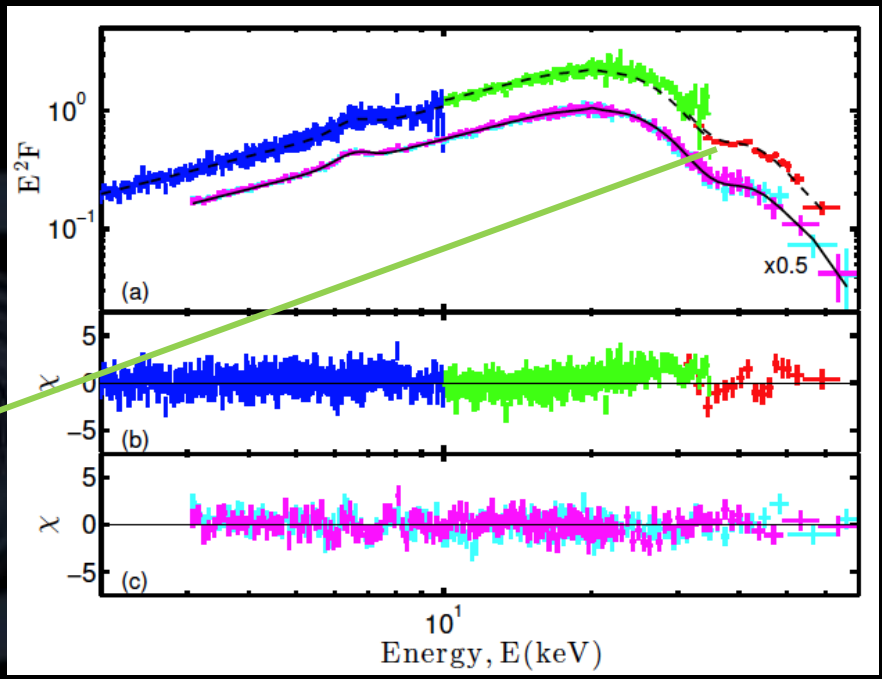


Maitra 2016

在强磁场中，高能电子围绕磁力线回旋运动呈现出量子态。光子被位于量子态的电子吸收，会形成回旋吸收线。回旋吸收线的能量直接对应着磁场强度，这是目前直接测量中子星磁场的唯一方法。

Neutron star cyclotron absorption line of Her X-1
“慧眼”确认了中子星回旋吸收线能量停止减少



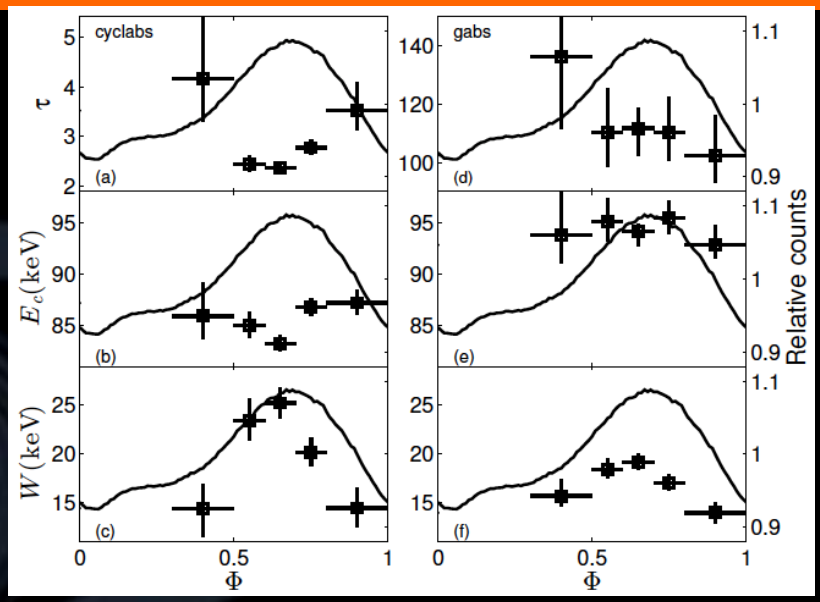


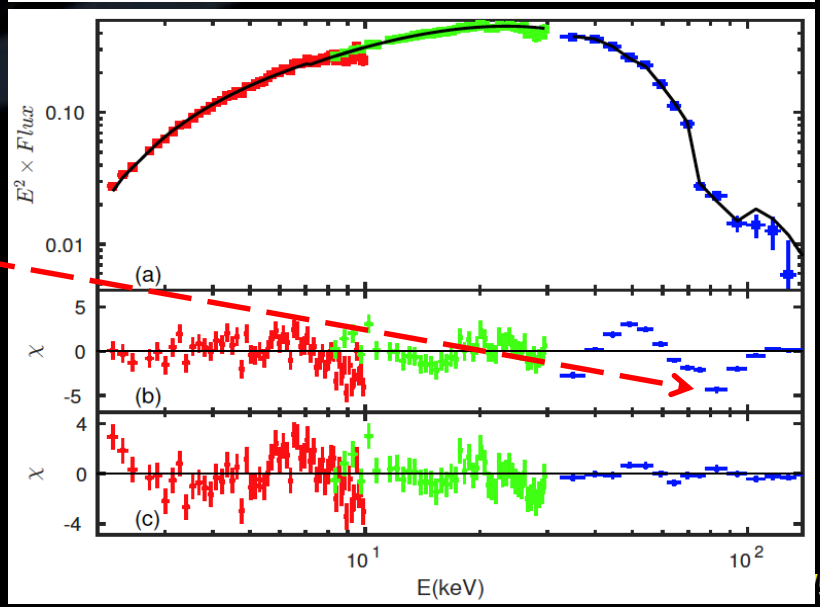
Constant cyclotron line energy in Hercules X-1 -- Joint Insight-HXMT and NuSTAR observations (@> 5 σ significance, Xiao et al. 2020）

Highest-E Neutron star cyclotron absorption line
“慧眼”显著探测到最高能量的中子星回旋吸收线

- GRO J1008-57：~85 keV → highest *B* directly measured in the universe ~10^{13}, ~ 4σ with NuSTAR & Suzaku ~79 keV
- 4 HXMT observations ~235 ks ~ 20σ detection

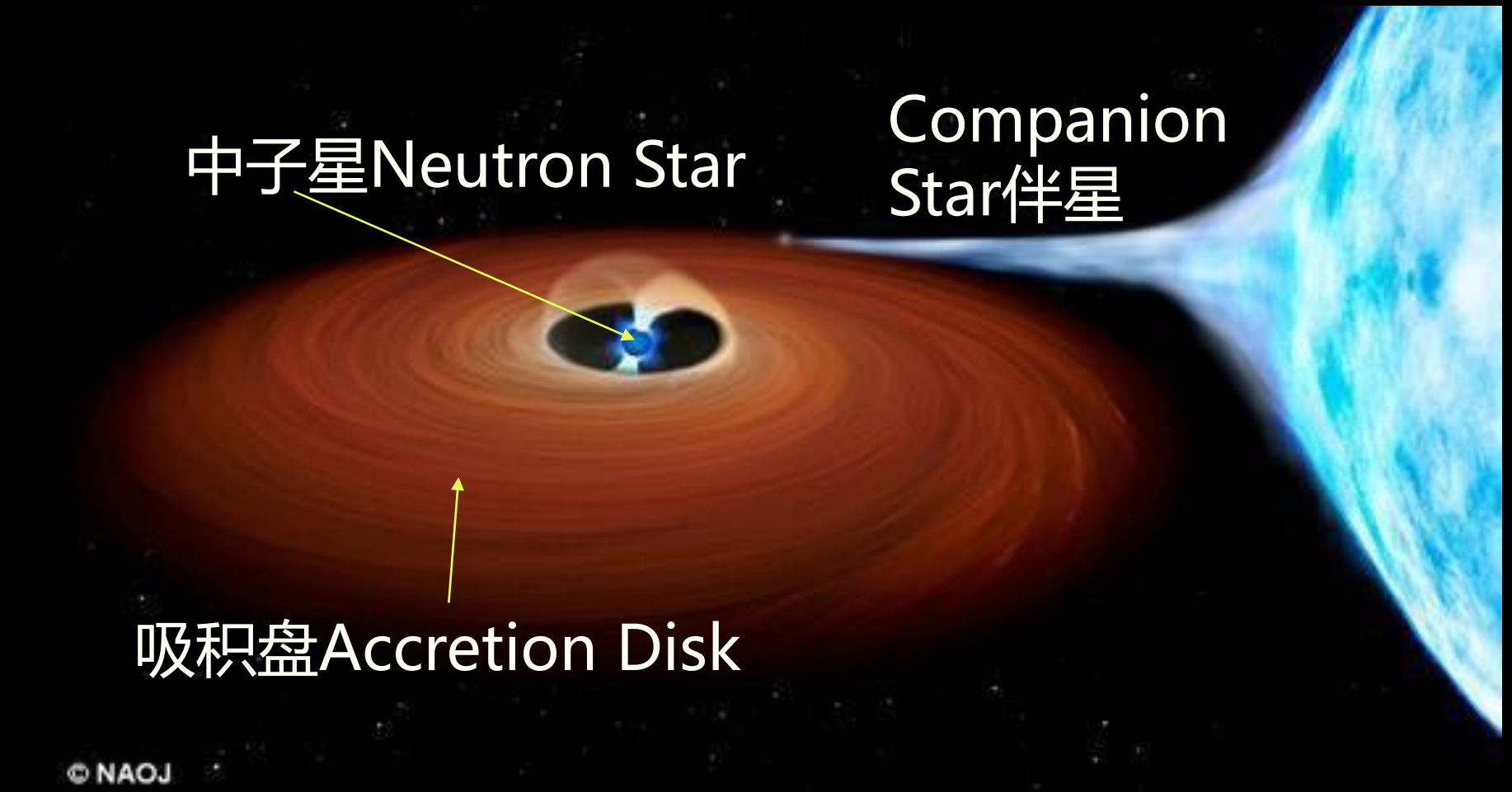
HXMT/HE one module, 17 modules ~ 20 σ
Allow for phase resolved and flux dependent studies





Ge et al. 2020

Extremely Complex Interactions in NSXBs
“吸积”中子星和吸积盘复杂的相互作用



Corona cooled by *single* Type-I X-ray burst
“慧眼”发现中子星高温冕被单个X射线暴冷却

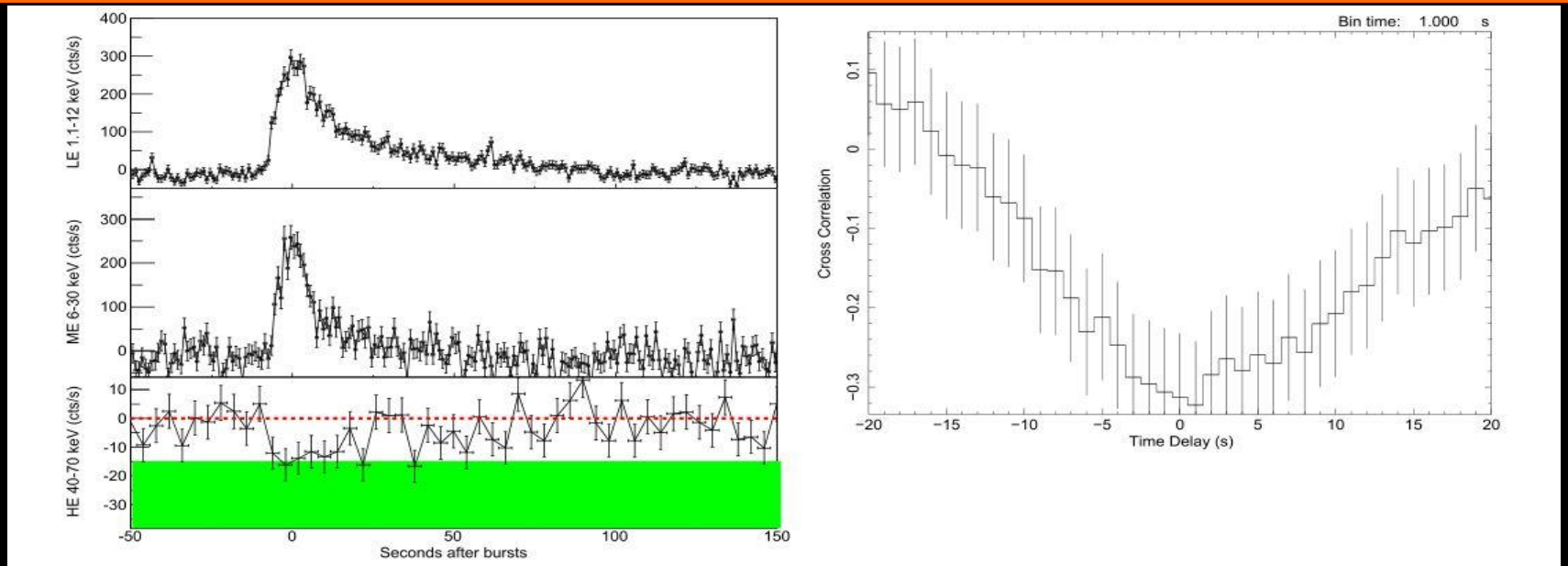
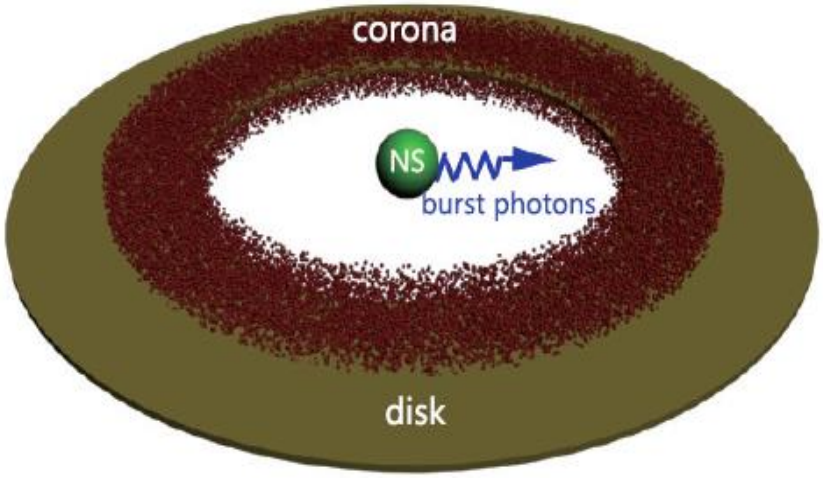
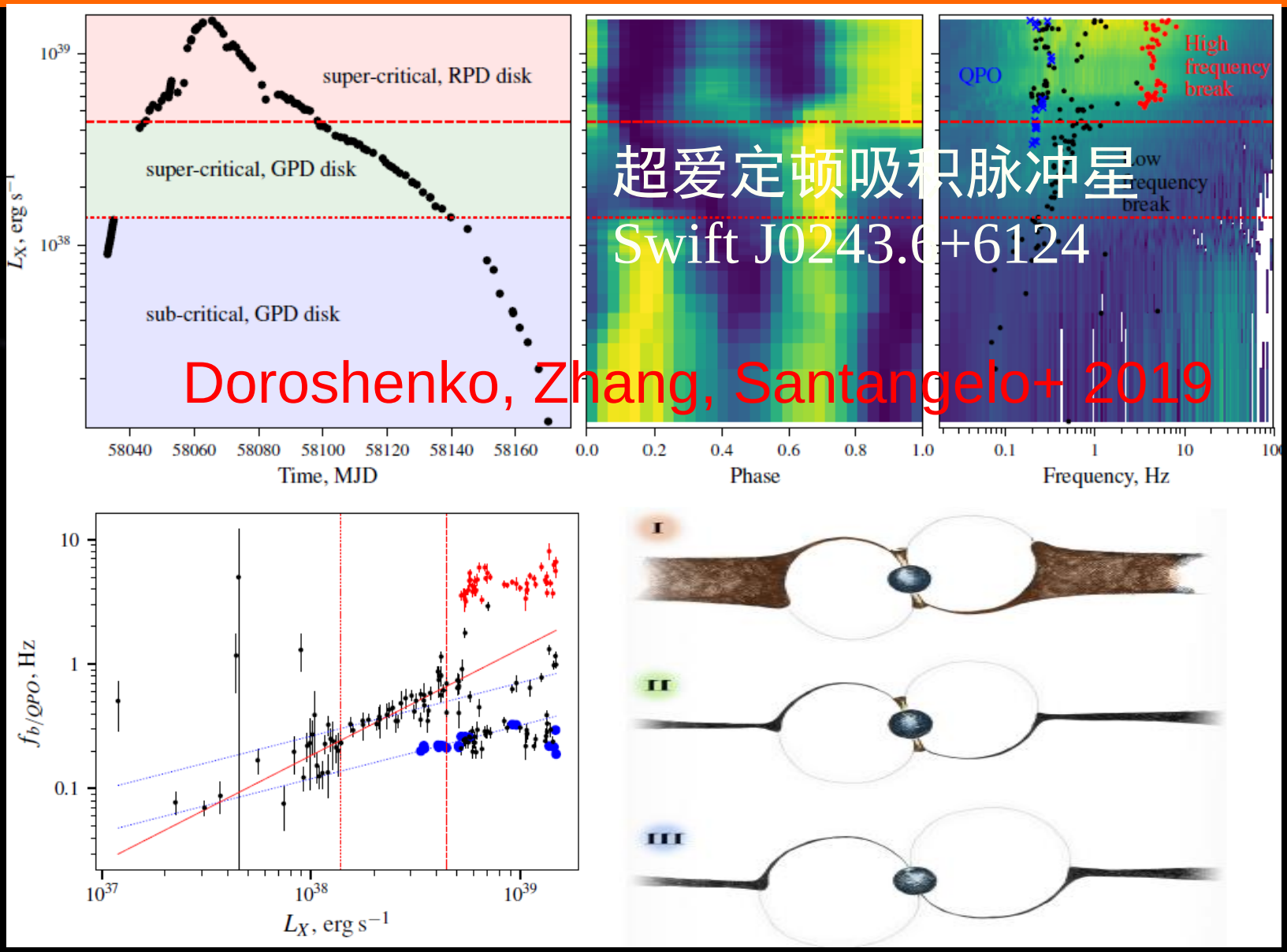


Figure 2. Left panel shows the LE, ME, and HE light curves of the burst in 1.1–12 keV, 5–30 keV, and 40–70 keV, respectively. The time bin for LE and ME is 1 s and HE is 4 s, the green zone in the bottom panel indicates the background level for HE detectors. The right panel shows the cross-correlation between the left panel's LE and HE re-extracted light curves with a time bin of 1 s.

以前需要几十个暴叠加，慧眼单暴就显著看到4U1636-536 Chen+2018, ApJL)



Insight-HXMT discovery of GPD to RPD transition
“慧眼”发现气压向辐射压转换的吸积盘

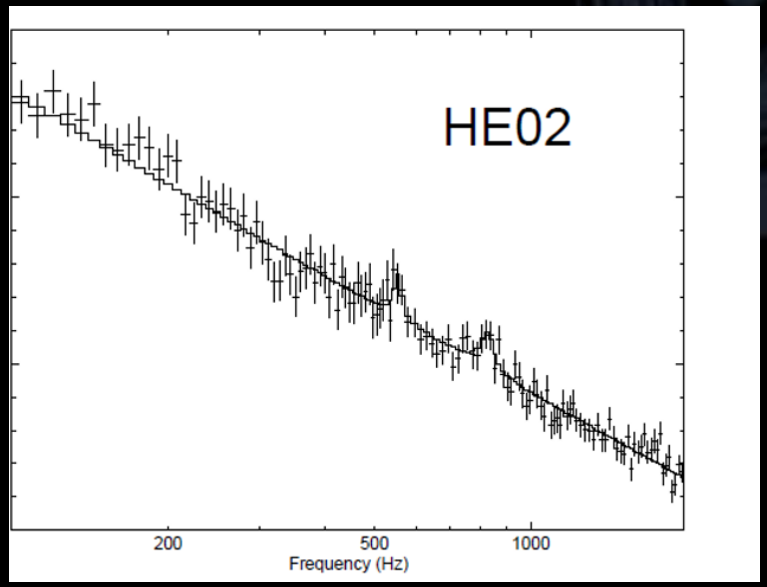


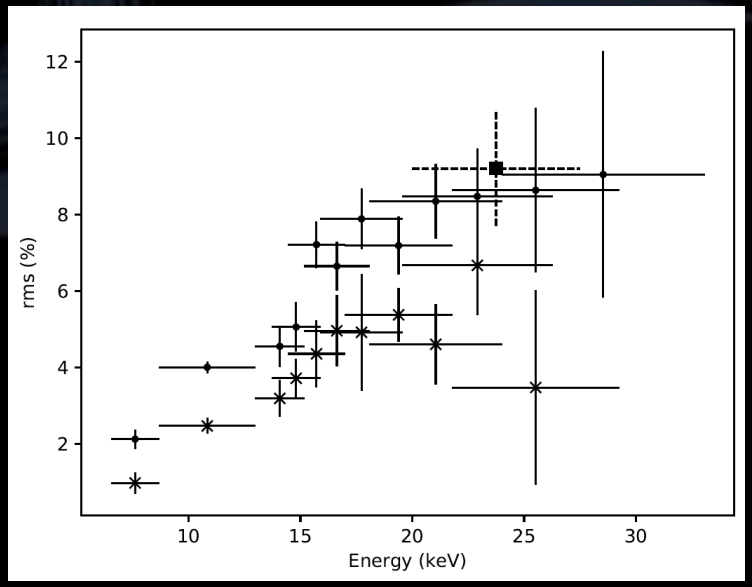
kHz QPOs>20 keV from Sco X-1 with Insight-HXMT
“慧眼”发现最亮X射线源的高能千赫兹准周期振荡

Discovery of Submillisecond Quasi-periodic Oscillations in the X-Ray Flux of Scorpius X-1

M. van der Klis[1], J. H. Swank[2], W. Zhang[2], K. Jahoda[2], E. H. Morgan[3], W. H. G. Lewin[3], B. Vaughan[4], and J. van Paradijs[5]

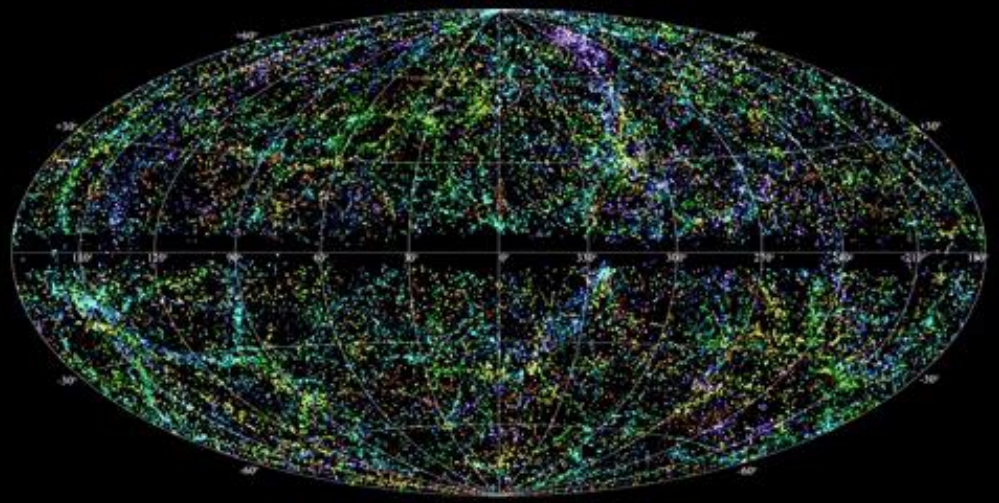
The Astrophysical Journal Letters, Volume 469, Number 1





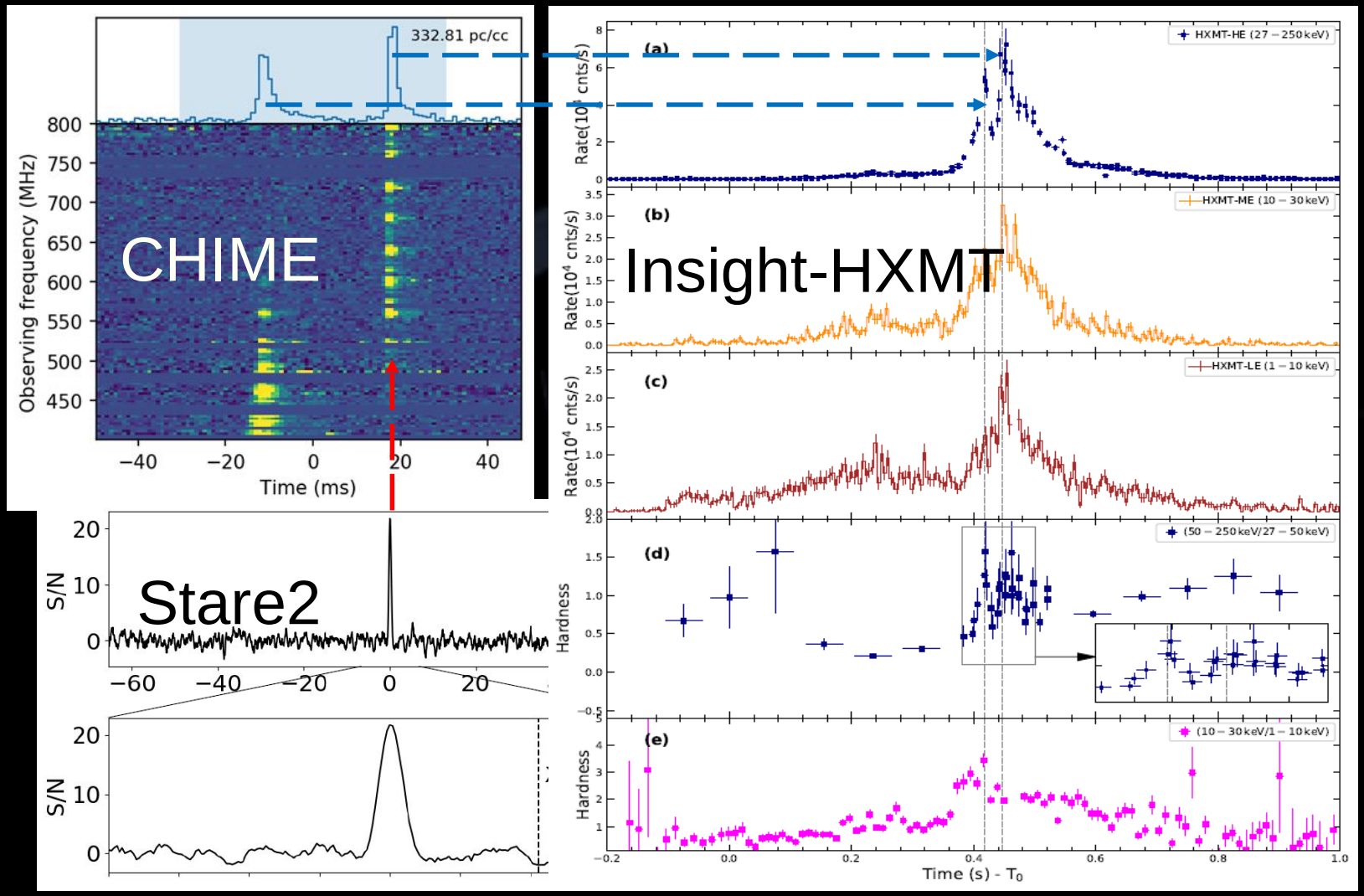
Insight-HXMT on Sco X-1 (Jia+ 2020, JHEAP, arXiv:1910.08382)

Fast Radio Bursts快速射电暴



First reported in 2007 (Lorimer et al. 2007): bright millisecond radio pulses, random arrival direction and time, some repeat and even periodic, but counterpart or radiation at any other wavelengths not known, until April 28th, 2020.

Historic event on April 28th 2020
2020年4月28号的历史事件



CHIME/FRB Collaboration+; Bochenek+; Li+ (2020, submitted to Nature)

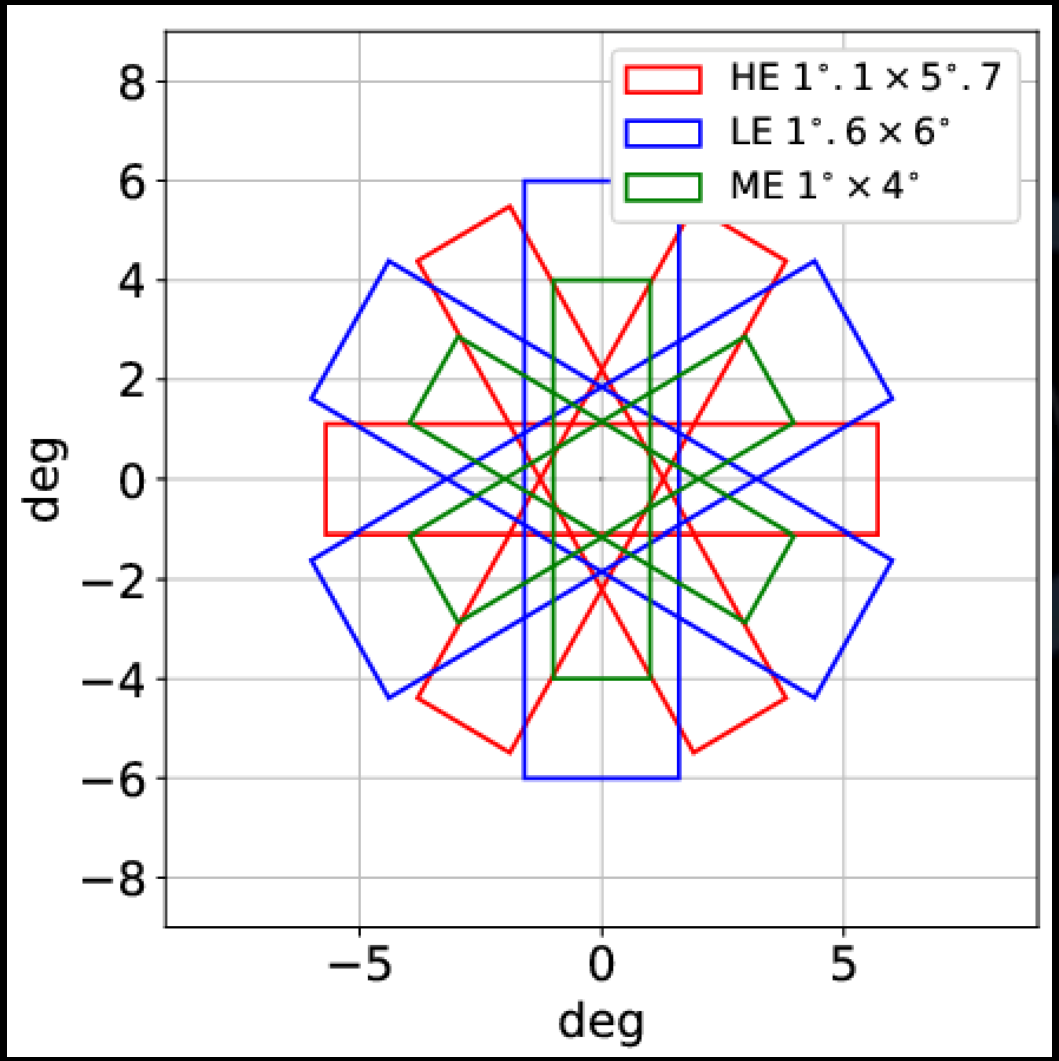
Main Events of *Insight*-HXMT on SGR1935
慧眼对SGR J1935+2154观测研究大事记

- ✓ UT 2020/4/28 07:14:52 to 4/29 11:53:01 (public ToO proposed by L. Lin)
- ✓ Atel #13687: Insight-HXMT detection of a bright short x-ray counterpart of the Fast Radio Burst from SGR 1935+2154
- ✓ Atel #13696/GCN #27675: Insight-HXMT X-ray and hard X-ray detection of the double peaks of the Fast Radio Burst from SGR 1935+2154
- ✓ Atel #13729/GCN #27718: Insight-HXMT's continued observation plan for SGR J1935+2154 (UTC 2020/4/30 06:58:25 to 2020/6/1 01:05:48, public ToO suggested by S. Kulkarni)
  - ✓ Several Insight-HXMT's bursts were simultaneously observed by PGIR (PI: M. Kasliwal, joint paper submitted, De+ 2020), many by radio telescopes.
- ✓ GCN #28027: Updated catalog of X-ray bursts of SGR J1935+2154 from Insight-HXMT observations (http://enghxmt.ihep.ac.cn/bfy/331.jhtml: 133 bursts, 8.64E-12 to 2.01E-06 erg/cm^2)
- ✓ May 10th, 2020, Insight-HXMT paper submitted to Nature

Questions answered by Insight-HXMT data
慧眼的数据回答的问题

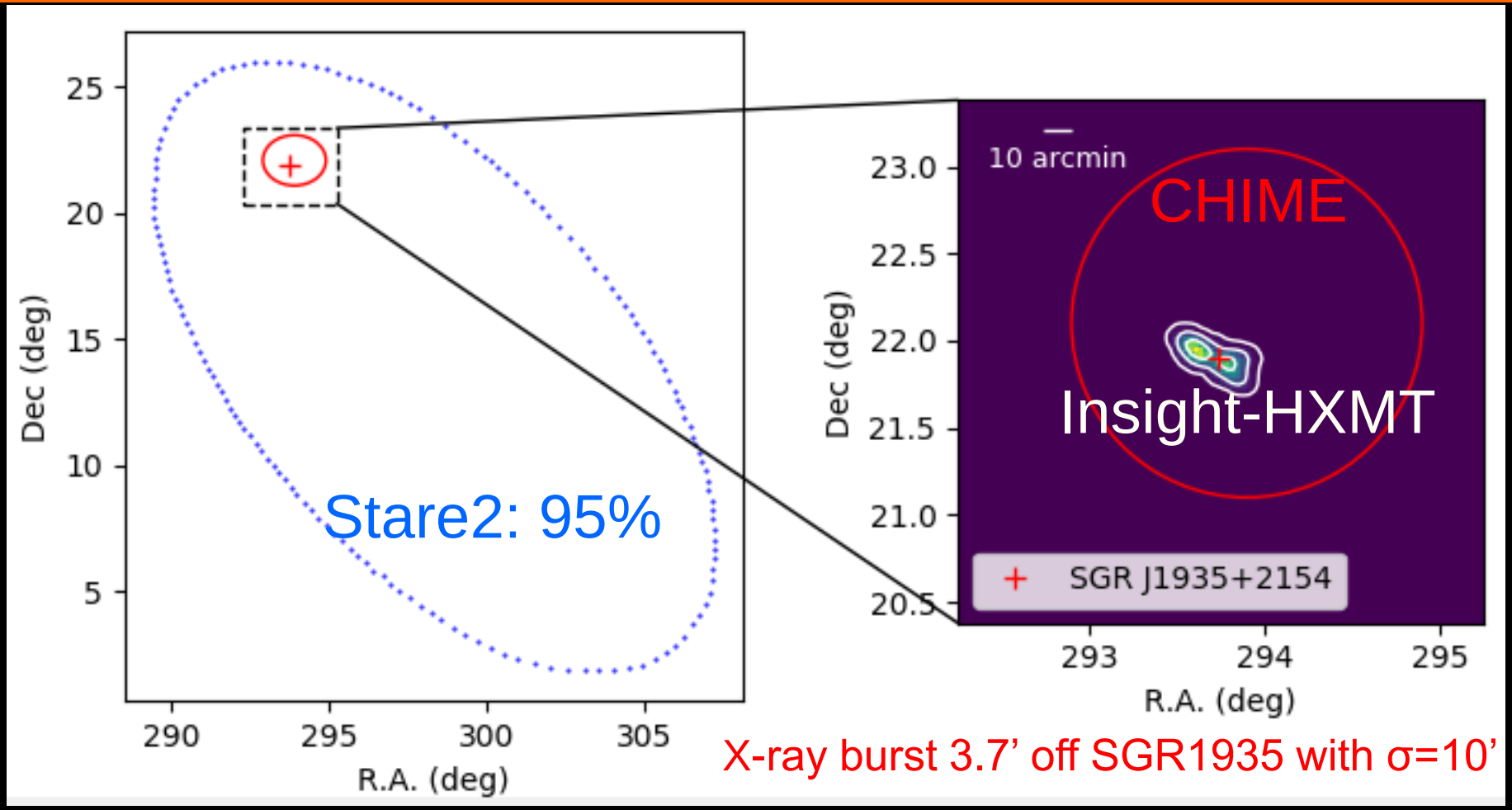
- ✓Did the X-ray burst on 2020-04-28 come from SGR J1935+2154?
- ✓Is the X-ray burst the high energy counterpart of FRB 200428?
- ✓Is the X-ray burst typical of SGR bursts?

Field of View of Collimators准直器视场



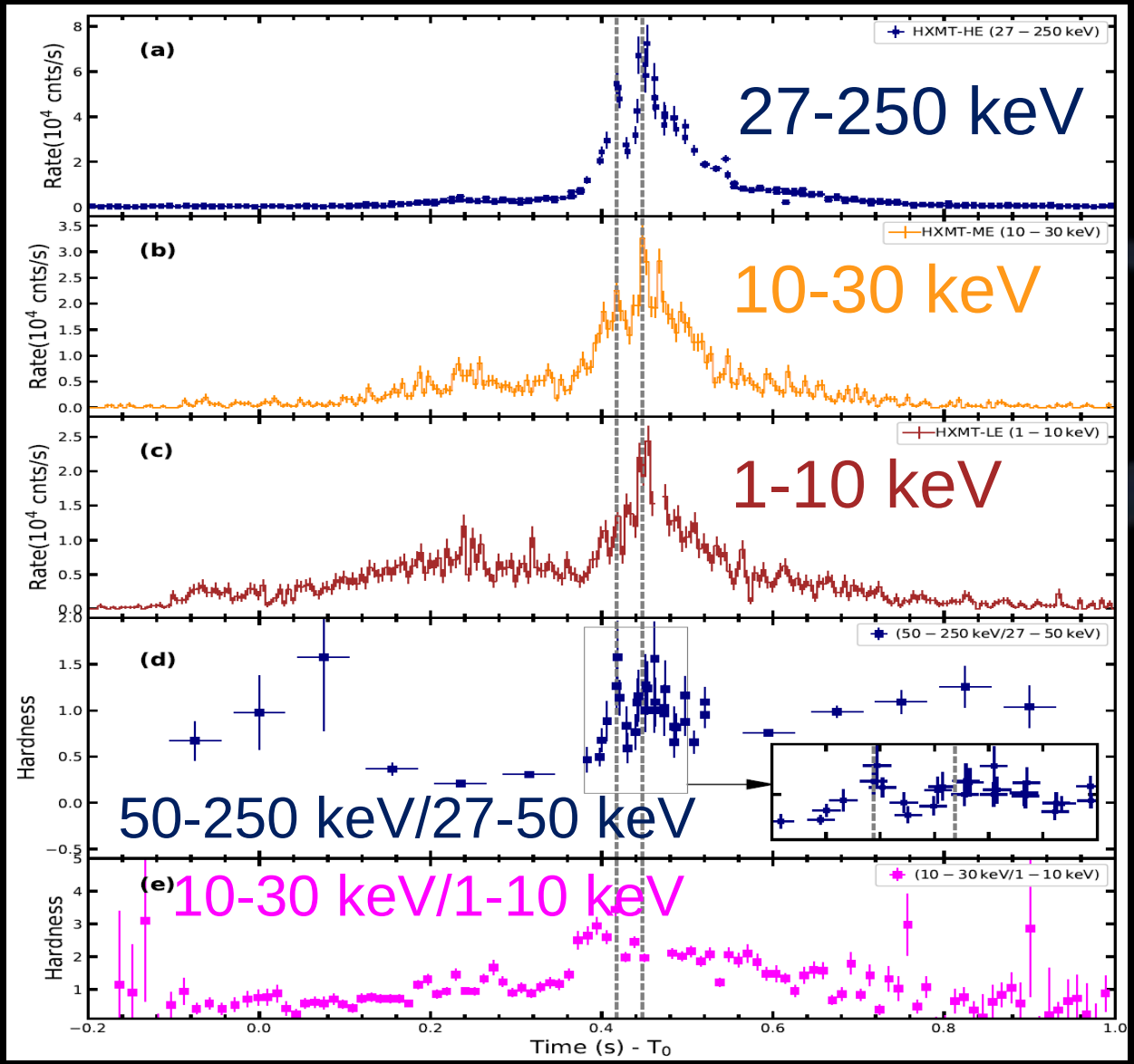
A source can be localized by comparing the count rates of the different detectors with different orientations of FOVs.

Localization of the X-ray burst定位X射线暴



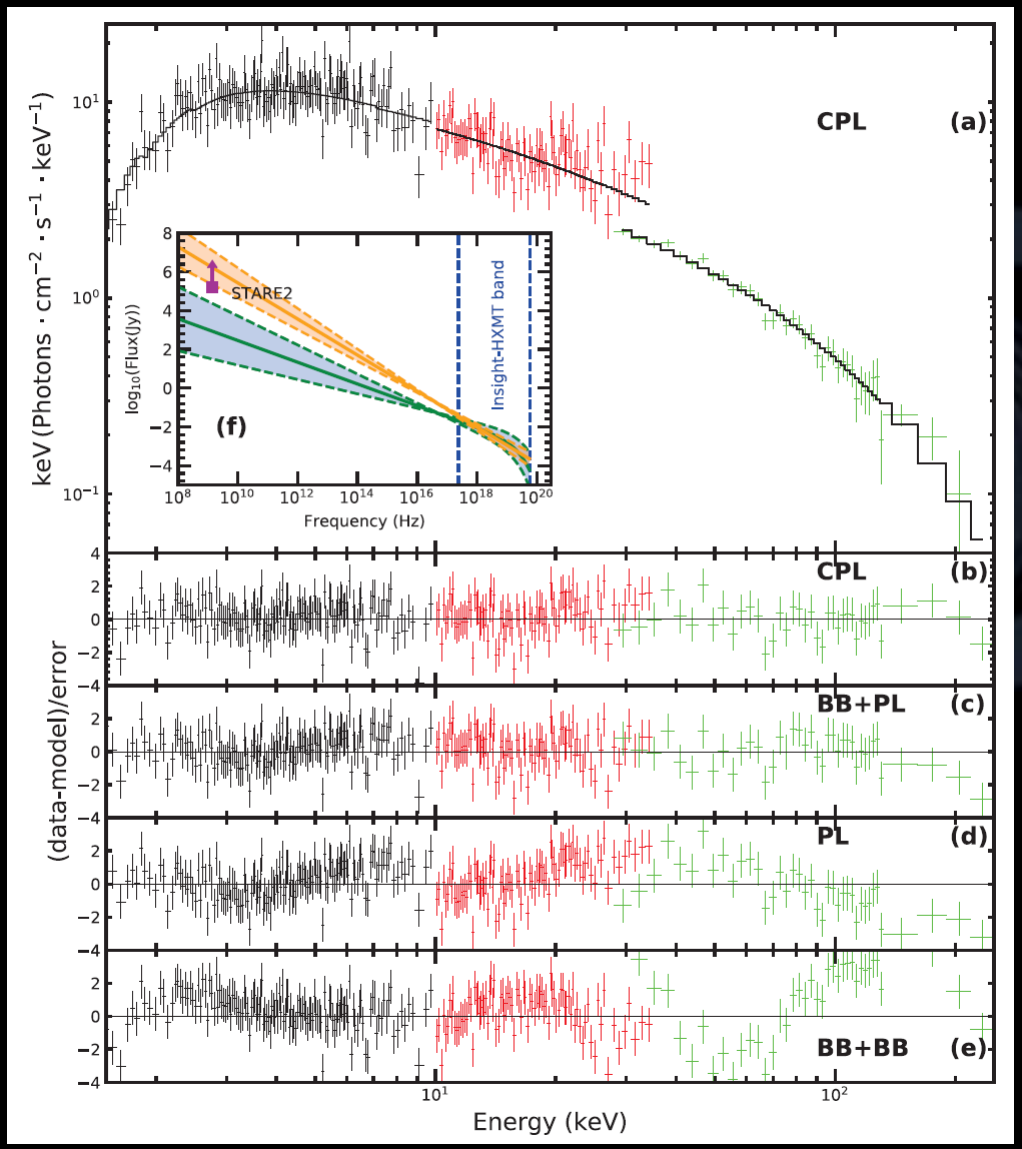
Identification of the X-ray burst with SGR1935, Li+ (Insight-HXMT team), submitted to Nature on May 10th, 2020

Insight-HXMT broad band light curves
慧眼宽能段光变



Two narrow X-ray peaks coinciding the twin radio pulses (30 ms separation), identification of the X-ray burst with FRB 200428: Insight-HXMT Atel #13696/GCN #27675, Li+ (Insight-HXMT team), submitted to Nature on May 10th, 2020

Insight-HXMT broad band spectrum
慧眼宽能段能谱



Both cutoff powerlaw & blackbody+powerlaw provide almost the same good fitting. BB+BB or PL rejected.

CPL: photon index ~1.6, Ecut~84 keV

BB+PL: Tbb~11 keV, photon index ~1.9

Li+ (Insight-HXMT team), submitted to Nature on May 10th, 2020

Is the X-ray burst typical of SGR bursts?
这是否典型的磁星X射线暴？

- ✓The X-ray burst is non-thermal: even in the BB+PL fitting, the BB component makes up only 18% of the total emission.
  - ✓A thermal origin is preferred for normal SGR short bursts.
  - ✓~6% of short bursts of SGR1935 can be best fit with PL.
  - ✓This X-ray burst (~10^{40} erg/s) is also one of the brightest from SGR1935, though 4-7 orders of magnitude less luminous than the SGR giant flares (~$10^{44\text{-}47}$ erg/s).

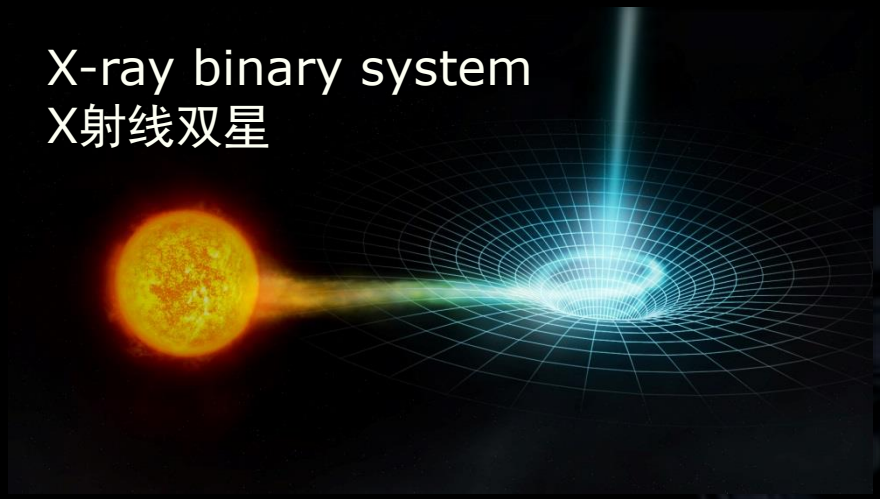
This X-ray burst is not a typical SGR burst.

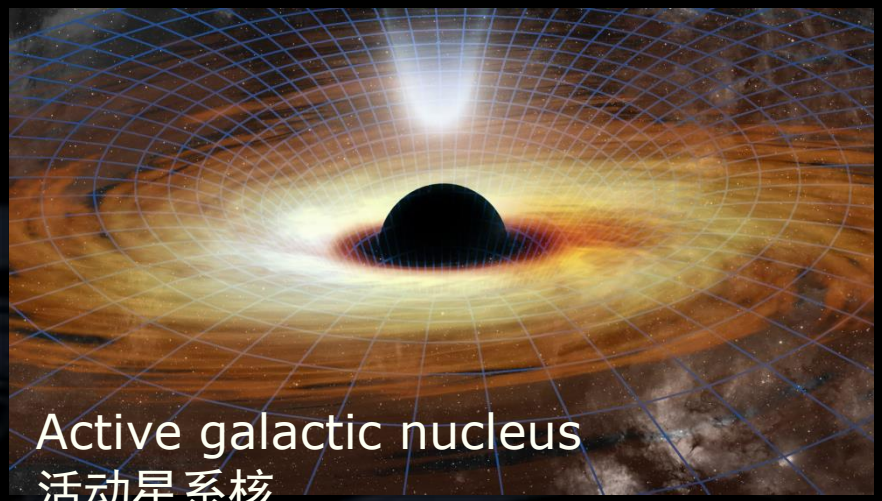
Answers to the Three Questions
三个问题的答案

- ✓Did the X-ray burst on 2020-04-28 come from SGR J1935+2154?
  - ✓Yes: Insight-HXMT localization
- ✓Is the X-ray burst the high energy counterpart of FRB 200428?
  - ✓Yes: Insight-HXMT localization + two narrow peaks
- ✓Is the X-ray burst typical of SGR bursts?
  - ✓No: non-thermal and bright.

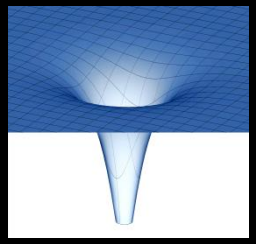
Additional and more interesting results from these observations will be submitted soon: stay tuned!

Extreme Gravity Near Black Holes
黑洞附近存在宇宙最强引力

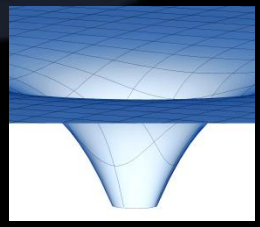




X-ray study covers wide mass range in uniform setting



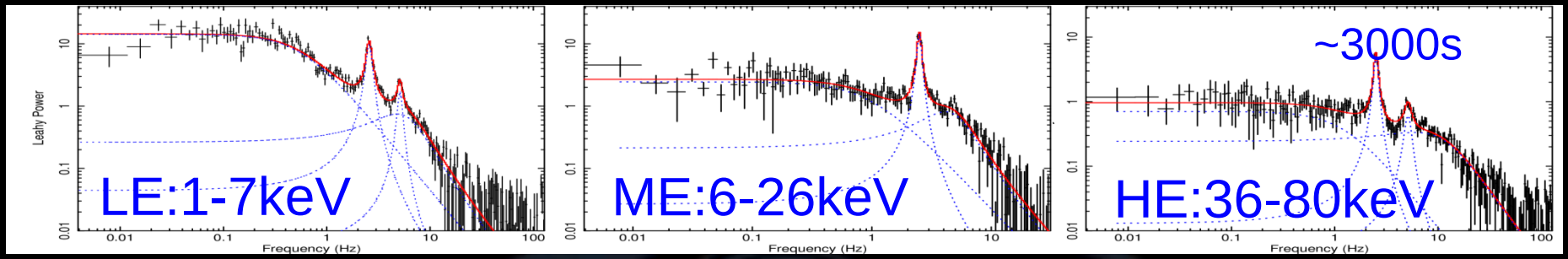
Stellar mass black hole
(or neutron star)
Strongly curved spacetime.
(10^{16} times Solar)

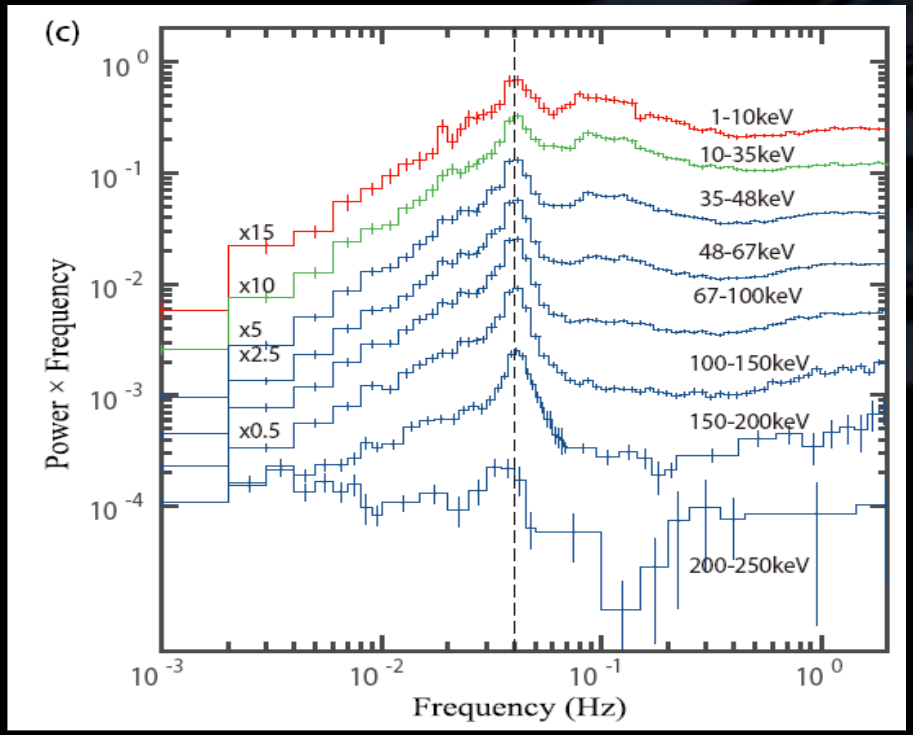


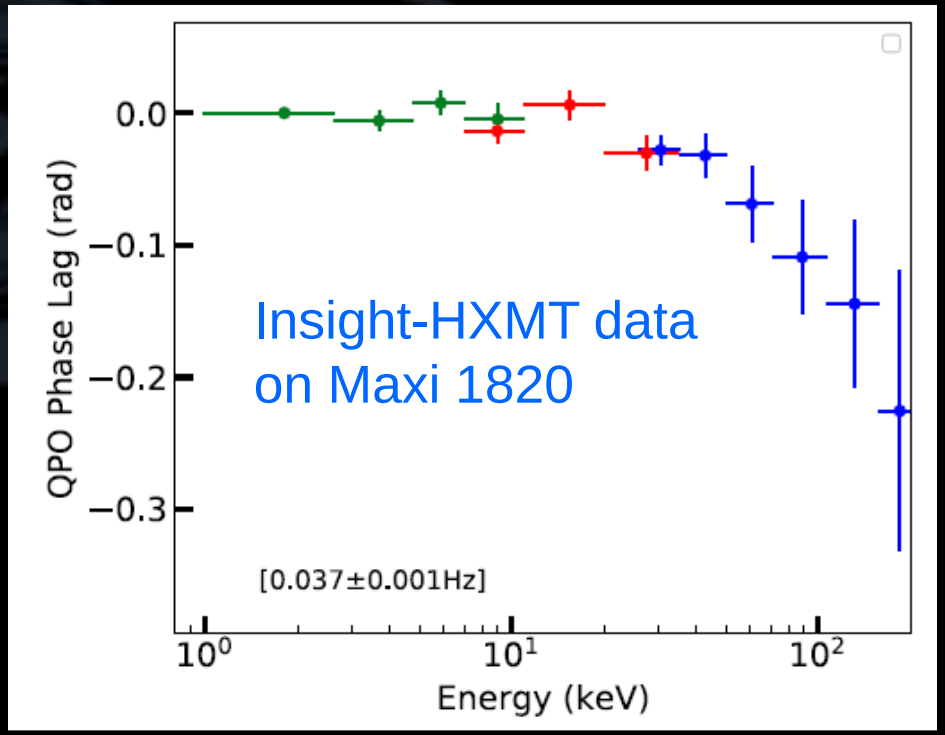
Supermassive black hole
Weakly curved spacetime
(~Solar)

TESTS OF GR PREDICTIONS IN THE STRONG FIELD REGIME OF GRAVITY.
COMPLEMENTARY TO GRAVITATIONAL WAVE EXPERIMENTS.

QPOs of BH binaries: < 30 keV → >200 keV
“慧眼”发现黑洞周围最高能量的准周期振荡

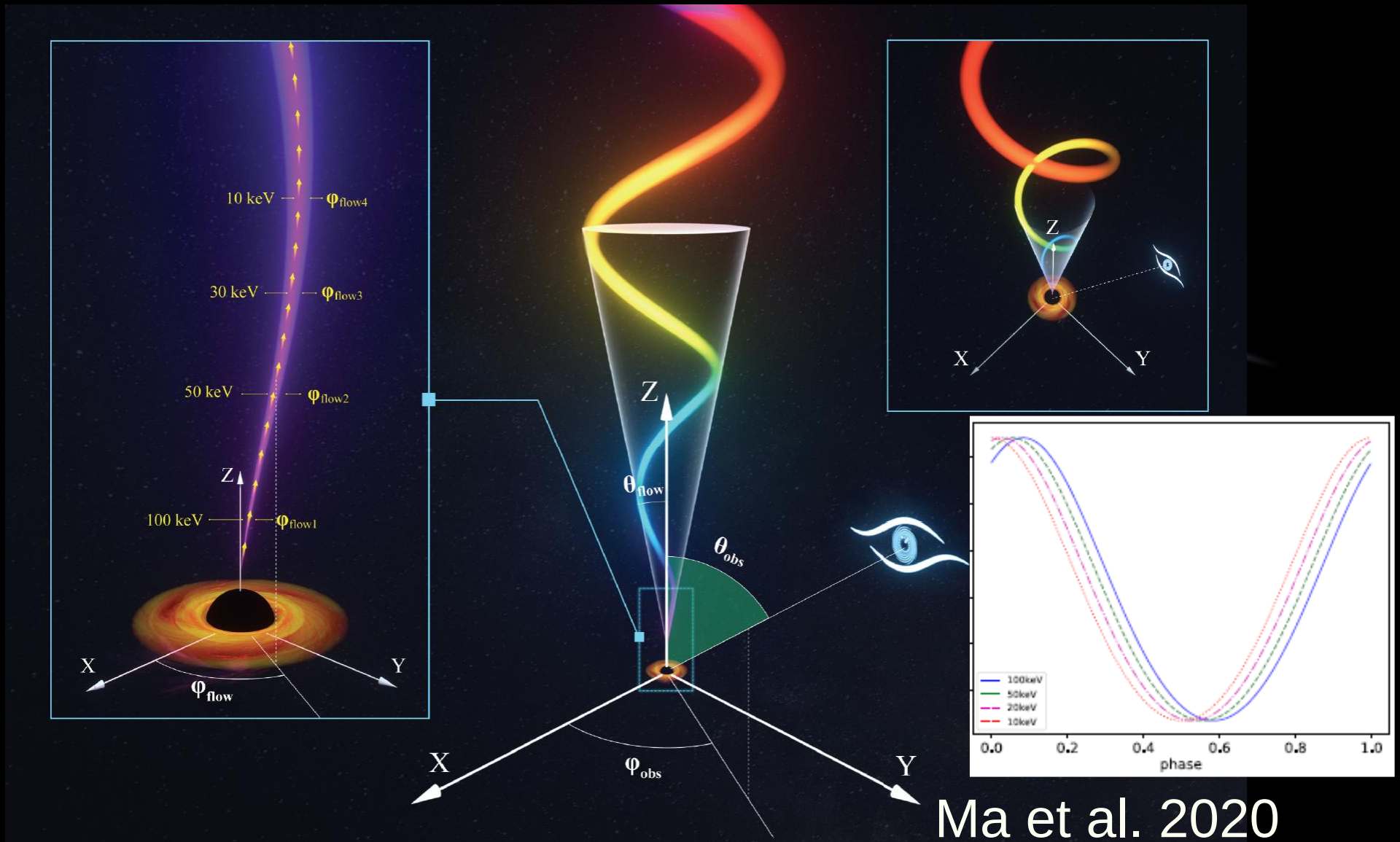






Huang et al. 2019; Ma et al. 2020

New model of BH QPOs: L-T precession Jet
基于“慧眼”观测结果建立的黑洞喷流进动模型



Ma et al. 2020

Further Evidence for X-ray Jet near BH
黑洞附近X射线喷流的进一步证据

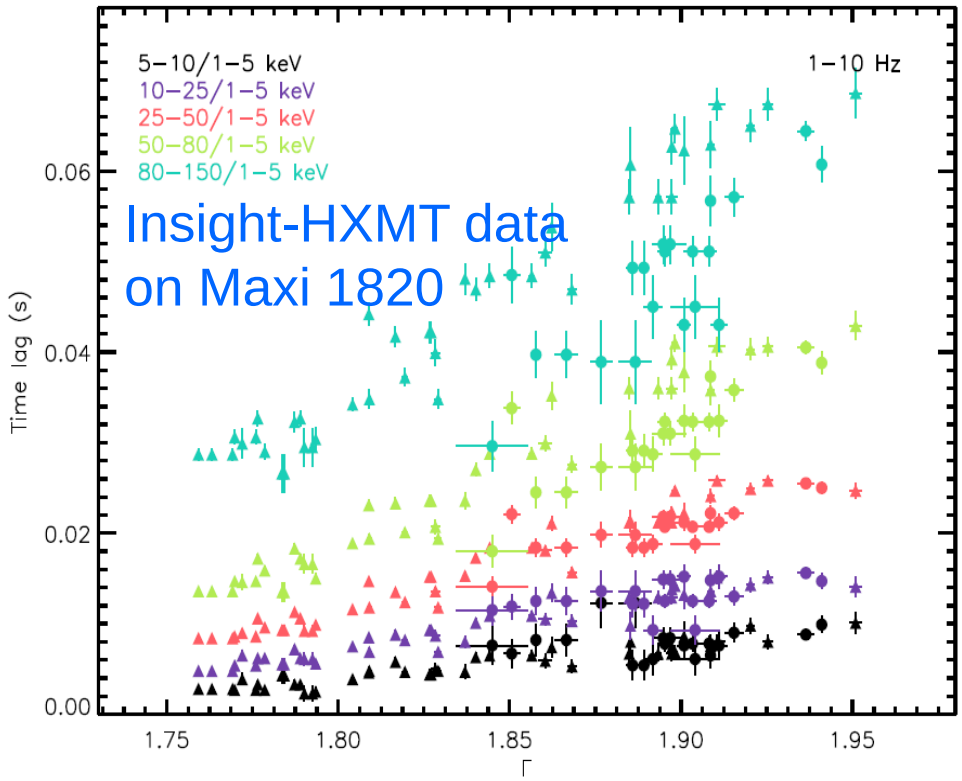
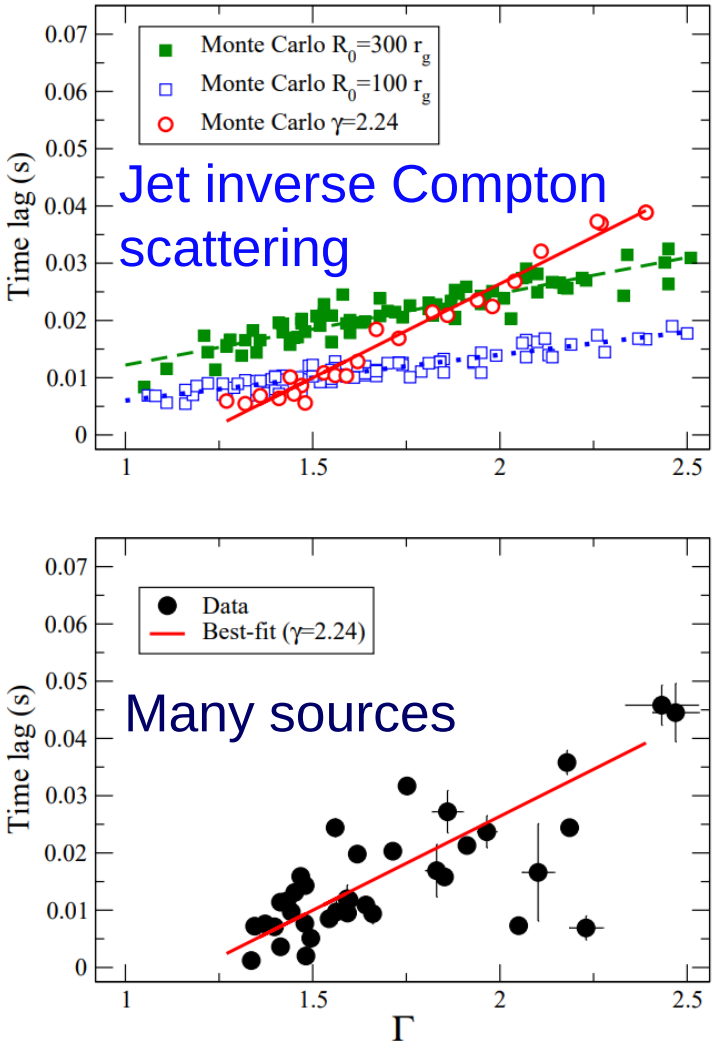


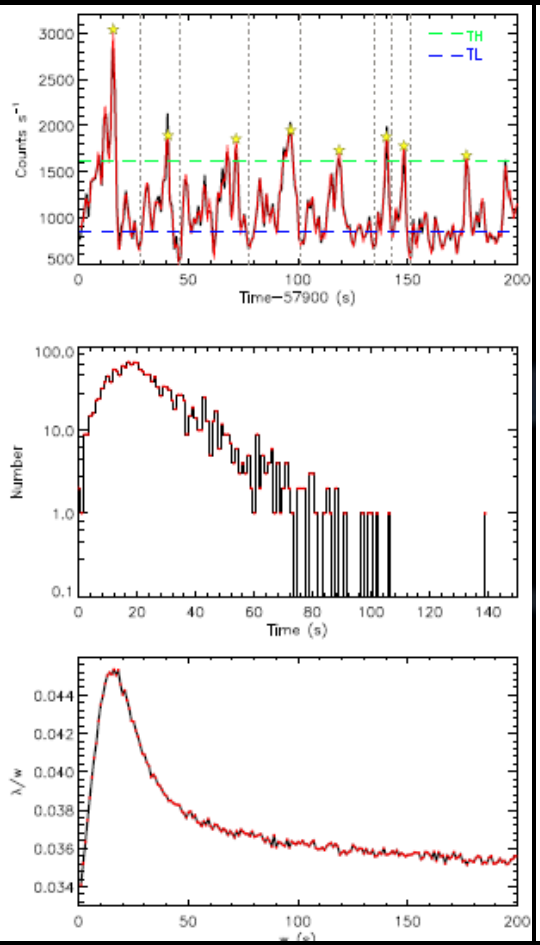
Figure 6. High-frequency time lags as a function of the photon index of the hard spectral component in MAXI J1820. As in Fig. 1, the triangles and circles correspond to epoch 1 and 2, respectively.

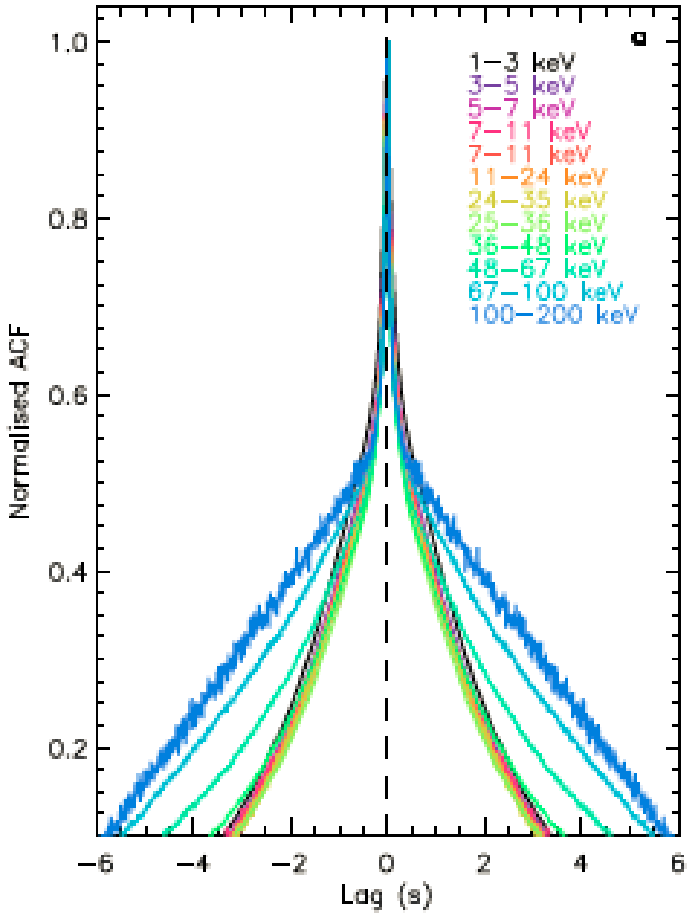
Wang et al. 2020

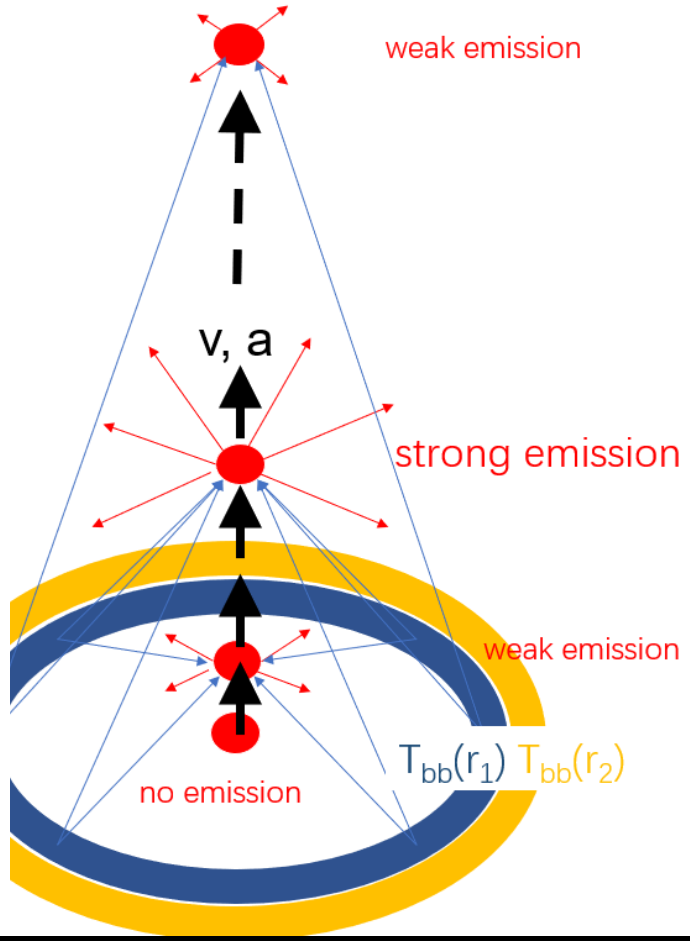


Reig et al. 2018

Hard X-ray flares from BHXBs→ Cannon Ball
基于“慧眼”的黑洞双星观测结果建立的炮弹模型



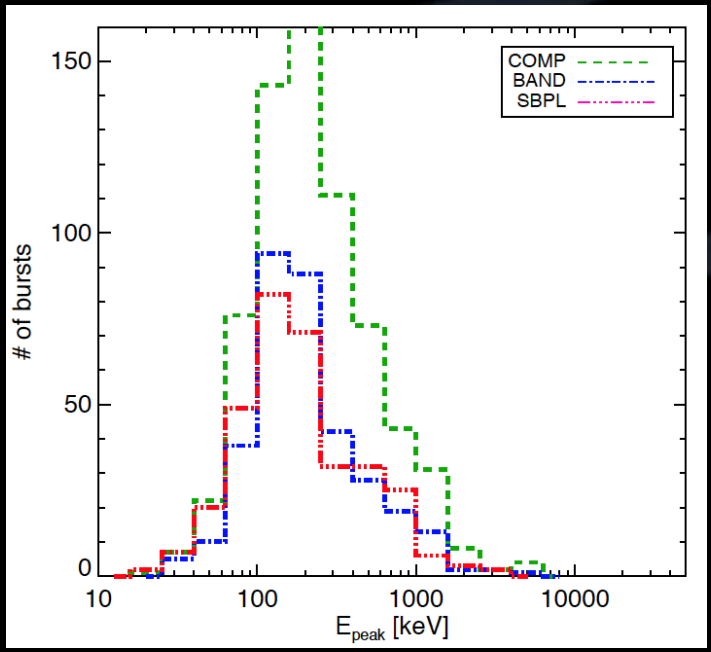




X-ray variability: 10-100 s, aperiodic, bright & coherent in all energy bands, explained in a new model: inverse Compton scattering of accretion disk photons in a vertically moving cannon ball → Lamp-Post. Wang et al. 2020

Dedicated working mode for GRB
“慧眼”伽马暴专用观测模式（后增加功能）

Working Mode	NaI energy band (keV)	CsI energy band (keV)	Detector Setting
Regular mode	20-250	40-600	Normal HV
GRB/LG mode	100-1250	200-3000	Lower the PMT HV, turn off the AGC



GRB Epeak measured by Fermi/GBM
（Gruber+, ApJS, 2014）

- **GRB mode better energy range:**
  - According to the simulation, det. efficiency is good for >200 keV
  - GRB Epeak distribution
- **GRB mode: ~30% of obs. time**
  - When the targeted source is occulted by the Earth in pointed observation
  - When HE regular mode is not very useful in an observation

Effective Area for GRBs & Pulsars
针对伽马暴和脉冲星的有效面积

- Can detect GRBs in **both** regular & GRB/LG modes (lower HV for PMT)
- GRB monitoring FOV: all sky un-occulted by the Earth
- 500~3000 cm^2 ~ MeV range with single photon counting and energy measurement, ~largest ~ MeV GRB & pulsar monitor ever flown

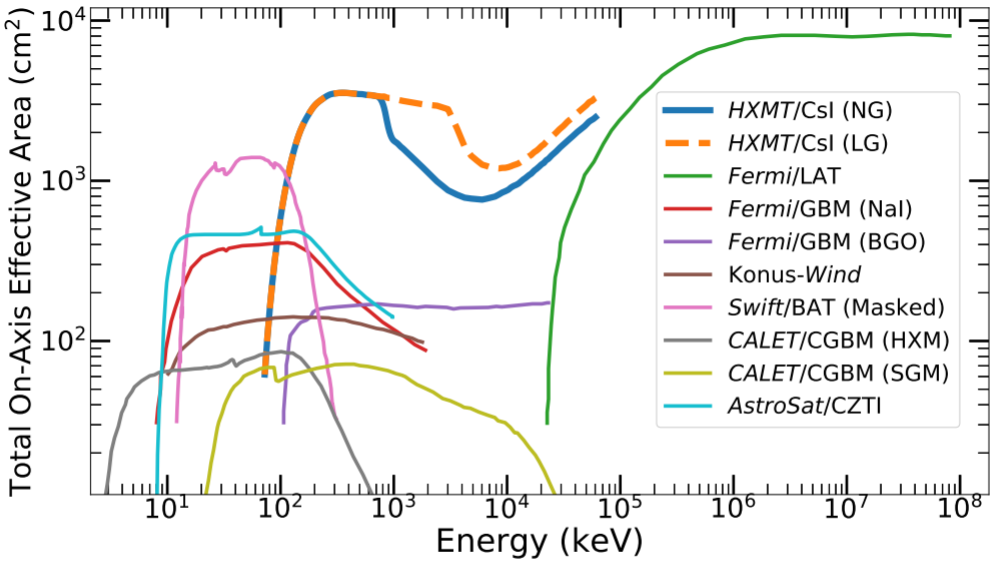
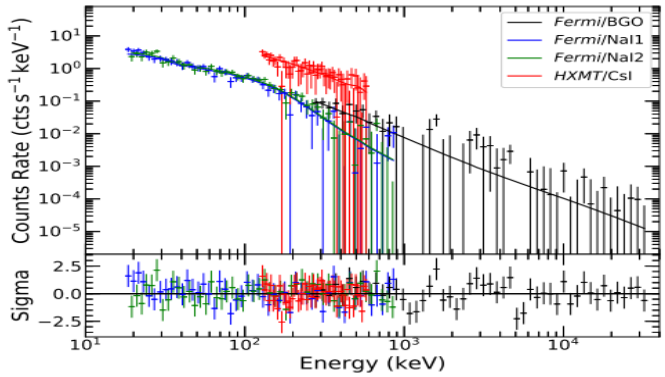


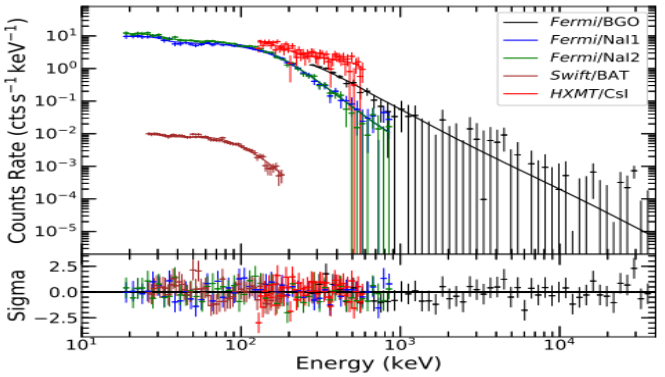
Figure 13: Effective areas of *HXMT*/CsI, *Fermi*/LAT, *Fermi*/GBM, Konus-*Wind*, *Swift*/BAT, *CALET*/CGBM and *AstroSat*/CZTI. The effective area of *Fermi*/GBM (NaI) is the averaged over the unocculted sky.

Luo et al. 2020

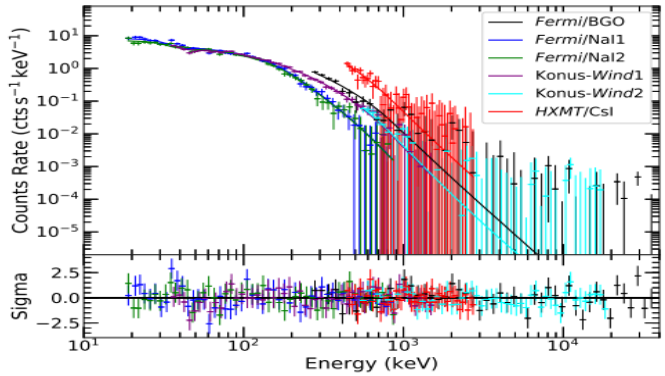
Multi-instrument GRB spectral fitting
多仪器伽马暴能谱拟合



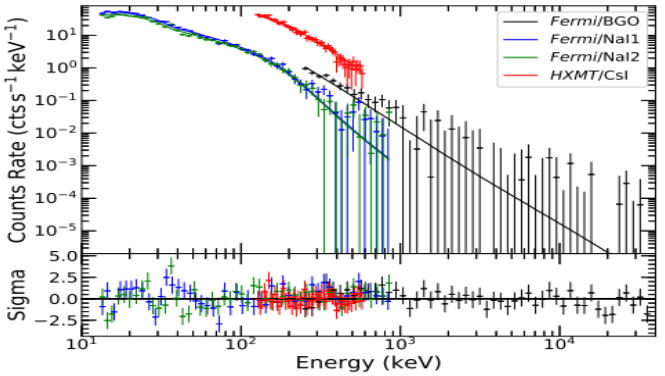
(c) GRB 180413A, NG mode



(d) GRB 180828A, NG mode



(e) GRB 181028A, LG mode

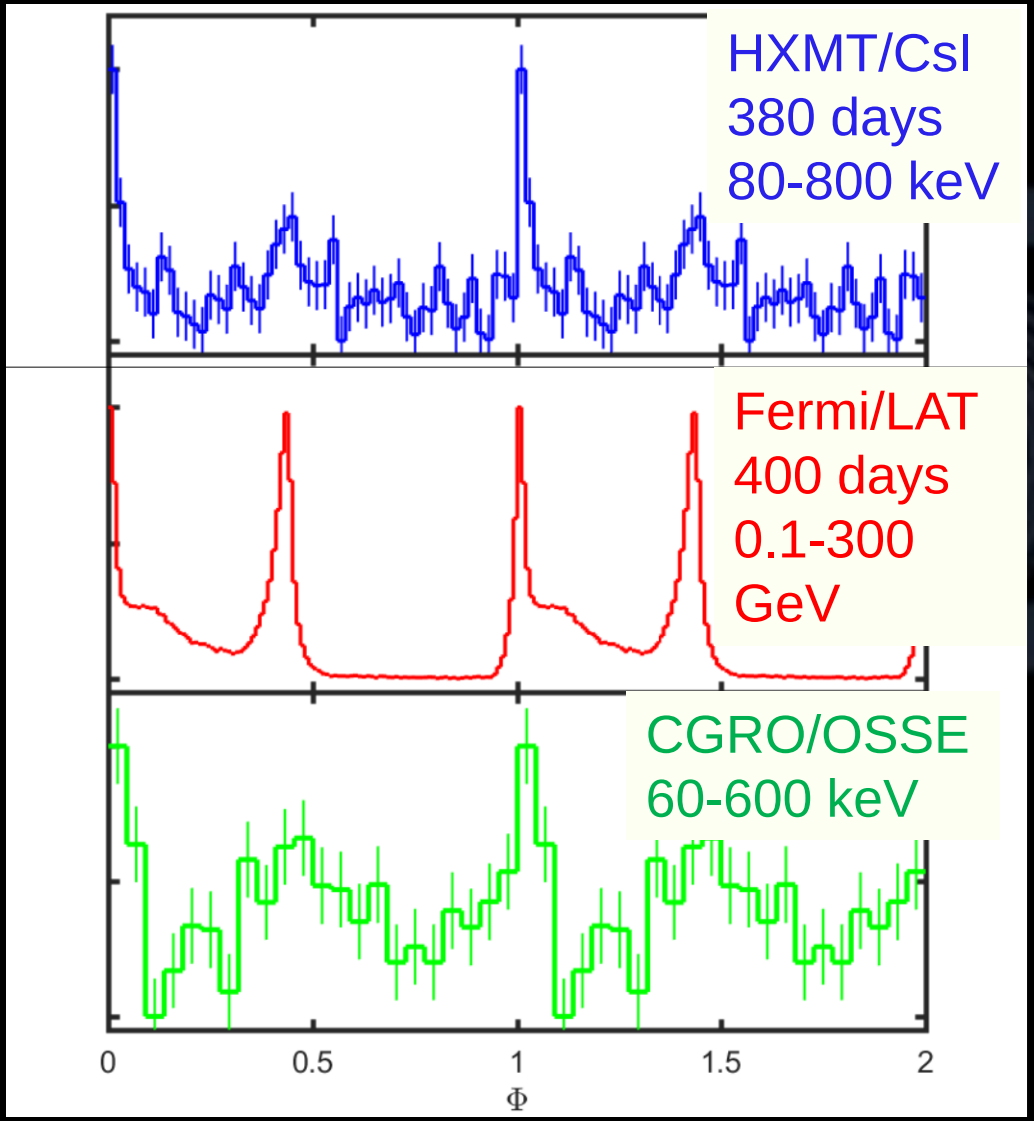


(f) GRB 181212A, NG mode

Figure 17: Joint spectral fitting of *HXMT*/CsI (red), *Fermi*/GBM BGO detectors (black), *Fermi*/GBM NaI detectors (blue and green), *Swift*/BAT (brown) and Konus-*Wind* (purple and cyan). In the joint fittings, the 18 *HXMT*/CsI spectra are merged and the merged spectrum are re-grouped to 50 energy bins for display clearly.

Luo et al. 2020

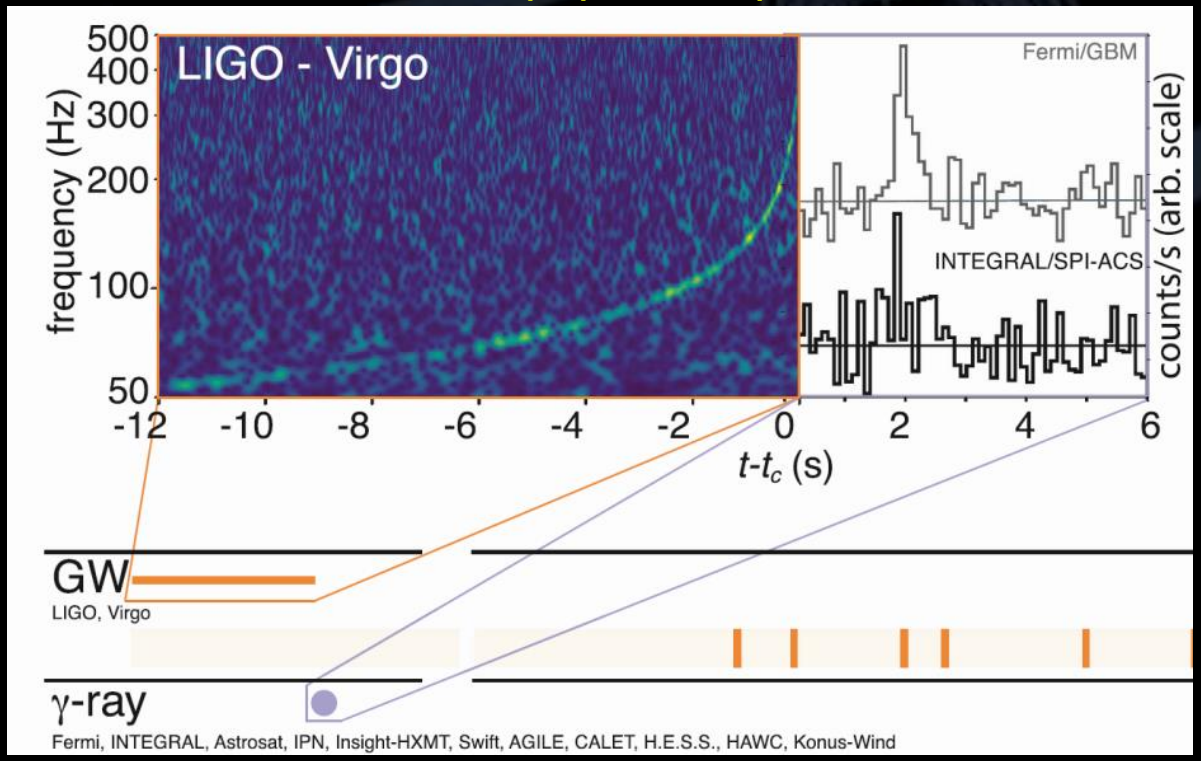
Best MeV detection of the Vela pulsar
“慧眼”得到了船帆脉冲星的最佳MeV探测结果

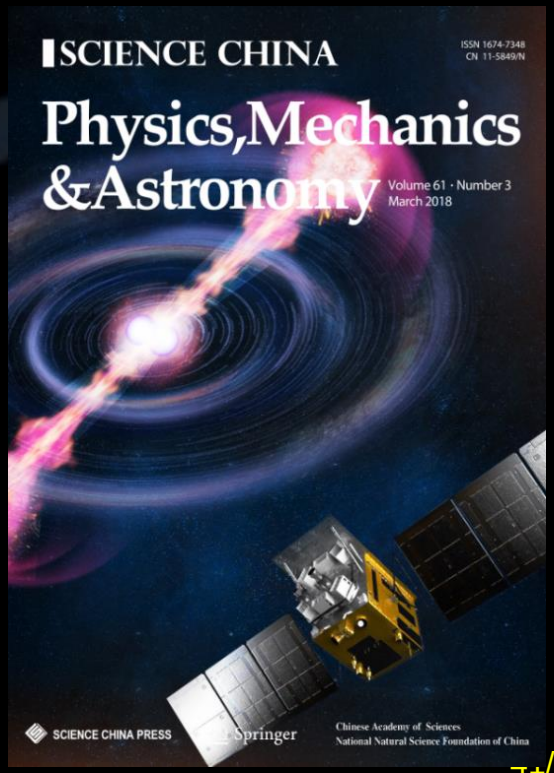


89 ms pulsar: radio, optical, X-ray, γ-ray

GW EM observations
“慧眼”的引力波电磁对应体观测

- ✓ **Monitored most GW triggers**
  - ✓ Reported observation results in LVC GCNs
- ✓ **Monitored the first BNS GW event GW170817**
  - ✓ GRB170817A was not detected in MeV range, including HXMT
  - ✓ Stringent upper limit constraint between 200 keV to 5 MeV
  - ✓ Joined the MMA paper and published detailed results in Science China





Insight-HXMT joined the MMA paper
“慧眼”加入了引力波多信使历史性论文

- ✓ Quick response, reported HXMT observation by LVC GCN
- ✓ Only 4 X/gamma telescopes monitored the GW source throughout the trigger time
  - ✓ *Fermi*/GBM, SPI-ACS, Konus-*Wind*, *Insight*-HMXT
  - ✓ HXMT has the largest eff. Area & time resolution in MeV
- ✓ Reported observation results in main context and table of MMA

The Astrophysical Journal Letters, 848:L12 (59pp), 2017 October 20 https://doi.org/10.3847/2041-8213/aa91c9

OPEN ACCESS

Multi-messenger Observations of a Binary Neutron Star Merger

LIGO Scientific Collaboration and Virgo Collaboration, Fermi GBM, INTEGRAL, IceCube Collaboration, AstroSat Cadmium Zinc Telluride Imager Team, IPN Collaboration, The Insight-Hxmt Collaboration, ANTARES Collaboration, The Swift Collaboration, AGILE Team, The 1M2H Team, The Dark Energy Camera GW-EM Collaboration and the DES Collaboration, The DLT40 Collaboration, GRAWITA: GRAvitational Wave Inaf TeAm, The Fermi Large Area Telescope Collaboration, ATCA: Australia Telescope Compact Array, ASKAP: Australian SKA Pathfinder, Las Cumbres Observatory Group, OzGrav, DWF (Deeper, Wider, Faster Program), AST3, and CAASTRO Collaborations, The VINROUGE Collaboration, MASTER Collaboration, J-GEM, GROWTH, JAGWAR, Caltech-NRAO, TTU-NRAO, and NuSTAR Collaborations, Pan-STARRS, The MAXI Team, TZAC Consortium, KU Collaboration, Nordic Optical Telescope, ePESSTO, GROND, Texas Tech University, SALT Group, TOROS: Transient Robotic Observatory of the South Collaboration, The BOOTES Collaboration, MWA: Murchison Widefield Array, The CALET Collaboration, IKI-GW Follow-up Collaboration, H.E.S.S. Collaboration, LOFAR Collaboration, LWA: Long Wavelength Array, HAWC Collaboration, The Pierre Auger Collaboration, ALMA Collaboration, Euro VLBI Team, Pi of the Sky Collaboration, The Chandra Team at McGill University, DFN: Desert Fireball Network, ATLAS, High Time Resolution Universe Survey, RIMAS and RATIR, and SKA South Africa/MeerKAT
(See the end matter for the full list of authors.)

Received 2017 October 3; revised 2017 October 6; accepted 2017 October 6; published 2017 October 16

GRB Statistics & GW follow-ups
“慧眼”伽马暴观测统计：~100/年，目前国际第二

Year	2017							2018							
Month	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8
All	2	10	9	12	8	8	8	11	8	7	11	6	8	7	4
short	0	3	5	3	5	2	1	1	1	1	3	2	2	2	0

Year	2018				2019			Total
Month	9	10	11	12	1	2	3	LG Mode：16；GCN：67/23 (1st)
All	4	4	5	6	7	6	12	163 gamma-ray bursts
short	1	0	2	1	0	2	2	39 short gamma-ray bursts

~100 GRBs/year @ ~MeV, ~¼ short GRBs > ~1/6 by GBM
GRB MeV flux limits and X-ray afterglow searches for GWs

High Precision X-ray Pulsar Navigation
“慧眼”实现了高精度脉冲星导航在轨验证

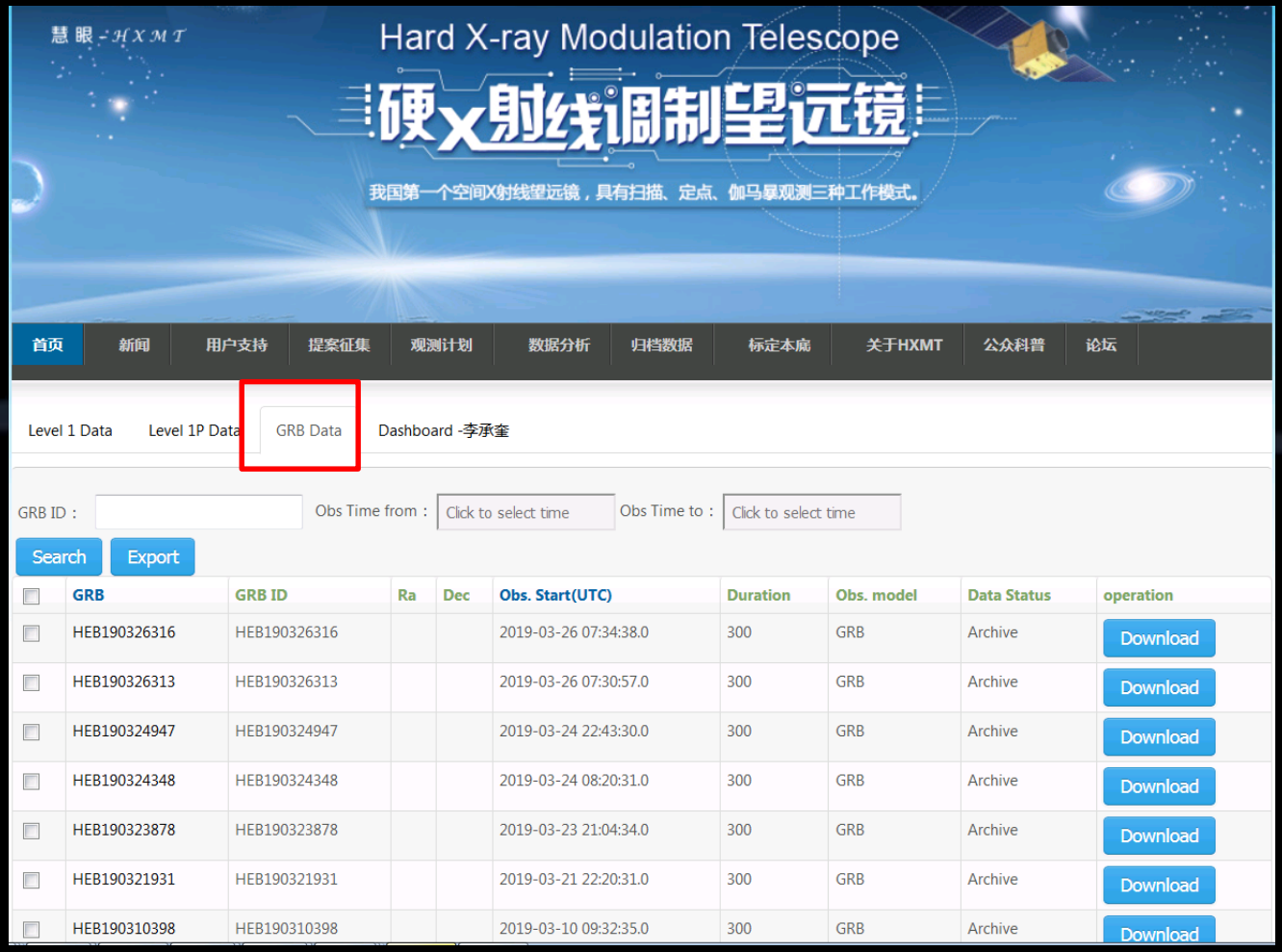
In-orbit demonstration of X-ray pulsar navigation with the *Insight*-HXMT satellite

S. J. Zheng[1], S. N. Zhang[1,2], F. J. Lu[1], W. B. Wang[3], Y. Gao[3], T. P. Li[1,2,4], L. M. Song[1],

In this work, we report the in-orbit demonstration of X-ray pulsar navigation with *Insight*-Hard X-ray Modulation Telescope (*Insight*-HXMT), which was launched on Jun. 15$^{\rm th}$, 2017. The new pulsar navigation method ‘Significance Enhancement of Pulse-profile with Orbit-dynamics’ (SEPO) is adopted to determine the orbit with observations of only one pulsar. In this test, the Crab pulsar is chosen and observed by *Insight*-HXMT from Aug. 31$^{\rm th}$ to Sept. 5$^{\rm th}$ in 2017. Using the 5-day-long observation data, the orbit of *Insight*-HXMT is determined successfully with the three telescopes onboard – High Energy X-ray Telescope (HE), Medium Energy X-ray Telescope (ME) and Low Energy X-ray Telescope (LE) – respectively. Combining all the data, the position and velocity of the *Insight*-HXMT are pinpointed to within 10 km (3σ) and 10 m s^{-1} (3σ), respectively.

Submitted to ApJS on 2018-09-03, accepted on 2019-06-11

Insight-HXMT GRB data products
“慧眼”伽马暴数据产品（可以公开下载使用）



http://hsuc.ihep.ac.cn/web/hxmtdata/grb

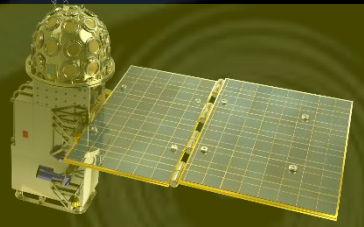
China's Space High Energy Astrophysics Missions

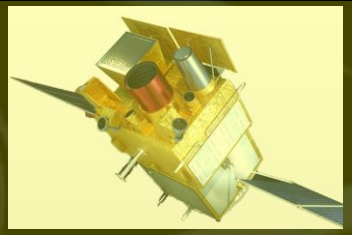
- ✓DAMPE (2015)
- ✓*POLAR (2016)
- ✓**Insight*-HXMT (2017)
- ✓*GECAM (2020)
- ✓SVOM (2022)
- ✓EP (2022)
- ✓*POLAR-2 (2024)
- ✓*eXTP (2027?)
- ✓*HERD (2025?)

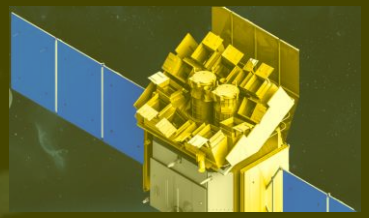

DAMPE 2015

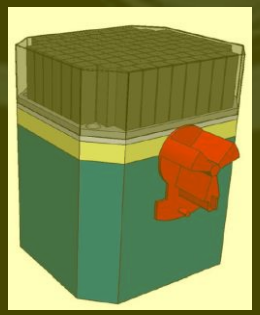

*POLAR 2016

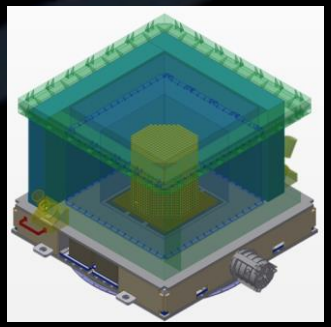

*HXMT 2017


*GECAM 2020


SVOM 2022


EP 2022


*POLAR-2 2024


*HERD 2025?


*eXTP 2027?

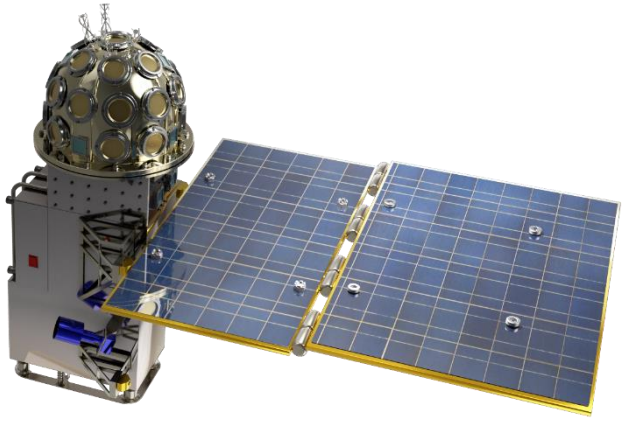
*IHEP the PI institution

GECAM: 2020

A leading mission in multi-messenger GW astronomy era

- **Sciences**
  - GW GRB (GW EM from keV to MeV)
  - Fast Radio Bursts (FRB), High Energy Neutrinos (HEN), GRB, Magnetar
- **Performance (better than existing ones)**
  - 100% all-sky FOV, high sensitivity, wide energy band, good localization (~1 deg)
- **Innovations**
  - Two small satellites, **ALL-TIME ALL-SKY**
  - BeiDou navigation system, **real-time data**
- **Mission of Opportunity**
  - Proposed in 2016, approved in 2018
  - **Plan to launch in 2020**, life time>3 yrs

GECAM星座



GECAM卫星

PI: Shaolin Xiong (IHEP)

SVOM (Space Variable Object Monitor): 2022

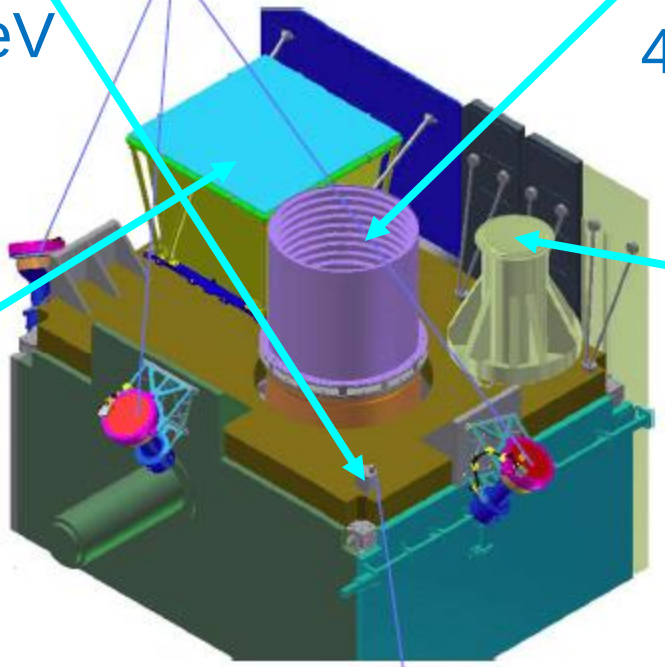
IHEP

GRM 30 keV-5 MeV

GRD

VT 400-650 nm, 650-950

Eclairs 4-250 keV



MXT 0.3-5 keV

GPM

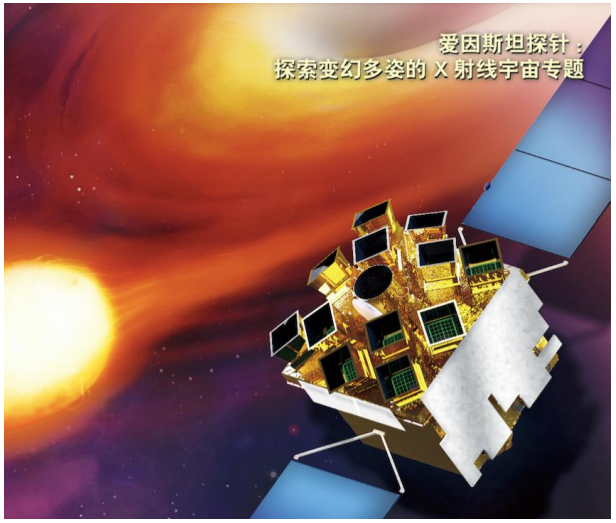
450-900 nm GWAC

400-1700 nm GFTs

PIs: Jianyan Wei, National Astronomical Observatories of China; Bertrand Cordier, CEA, France

The Einstein Probe (EP) mission: 2022

- **The first mission that uses Lobster-eye optics to monitor transients in the soft X-ray band.**
- **Proposed in 2012, selected in the end of 2017**
- **Launch date: ~2022**



Mission Features

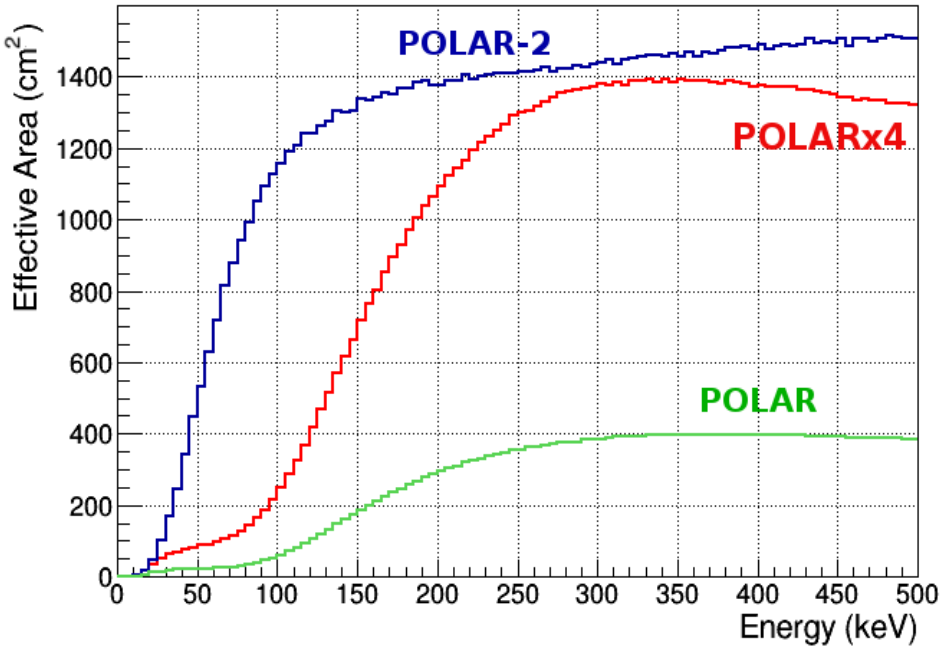
- Very wide FoV 1.1 sr (3600 sq. deg.) grasp: ~10,000 $deg^2.cm^2$
- Good angular resolution (~5') and positioning accuracy (<1')
- Soft X-ray band: 0.5-5 keV
- Sensitivity: **>1 order of magnitude higher** than current telescoeps
- Autonomous X-ray follow-up (<10 arcsec localisation) (IHEP)
- Fast alert data downlink and fast uplink for ToO (TBC)

PI: Prof. Weimin Yuan, National Astronomical Observatories of China

POLAR-2 on China's Space Station:2024

- Flight on-board China's Space Station
- Detailed polarization measurements for 30 GRBs per year
- time resolved polarization measurements for 10 GRBs per year
- launch ~2024, operation for 2 years

Selected on June 12, 2019



PIs: Xin WU (UniGE)
Shuang-Nan Zhang (IHEP)

UNIVERSITÉ DE GENÈVE NCBJ MPE Institute of High Energy Physics Chinese Academy of Sciences

Summary总结

- ✓*Insight*-HXMT is China's 1st X-ray astronomy satellite.
  - ✓1-15, 5-30, 20-250 keV (pointed) and **0.2-3 MeV (all-sky monitor)**
- ✓An open small-observatory
  - ✓Core program: all scientists working in China (most data now public)
  - ✓Guest program: world-wide
    - ✓AO-3 starts from Aug.1st (more time than core program)
  - ✓Coordinated multi-λ observations: space & ground
- ✓Several more missions coming!

hxmt.cn for all information and data download. Thanks!

ads: year:2017-2020 full:"HXMT"