Highlights of China's first X-ray astronomy satellite *Insight*-HXMT

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Insight-HXMT[1] (Figure 1) is China's first X-ray astronomy satellite and was successfully launched on June 15th, 2017. As shown in Figure 2, it carries three sets of collimated X-ray instruments with large effective areas, covering energy ranges of 1-15 keV, 5-30 keV, and 20-250 keV, respectively. In addition, it can also serve as an all-sky monitor for high energy sources between 0.2 to 3 MeV. The satellite and all its instruments have been working smoothly. It is anticipated to make scientific observations at least for 4-5 more years. Further information on *Insight*-HXMT and its data archive can be obtained from http://hxmt.cn/.

Figure 1: An artist's illustration of Insight HXMT in space[1].

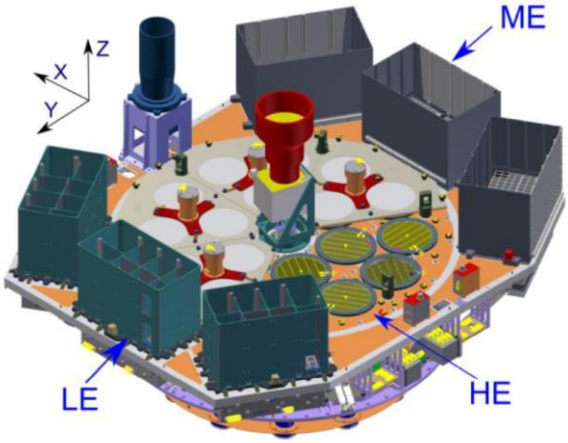

Figure 2: The three collimated X-ray instruments: LE (1-15 keV), ME (5-30 keV) and HE (20-250 keV)[1].

Some major discoveries of *Insight*-HXMT include the highest energy kilo-Hz quasi-periodic oscillations from accreting low-mass neutron star X-ray binaries[2], suggesting possible non-thermal processes in the very hot plasma very close to the neutron star; the highest energy low frequency quasi-periodic oscillations from accreting black hole X-ray binaries, suggesting possible origin of precession of relativistic jet produced by magnetic reconnection[3] (Figure 3); the highest energy cyclotron absorption feature from accreting and highly magnetized neutron stars[4]; identification of a non-thermal X-ray burst from a Galactic magnetar and a fast radio burst[5], discovery of the first counterpart of a fast radio burst. It has also detected hundreds of gamma-ray bursts, solar flares and terrestrial gamma-ray flashes, with its largest effective area around MeV.

In this talk, I will review some highlights of the scientific results of *Insight*-HXMT, on accreting X-ray binaries harboring black holes or neutron stars, isolated pulsars, gamma-ray bursts and scanning survey of the Galactic Plane[6].

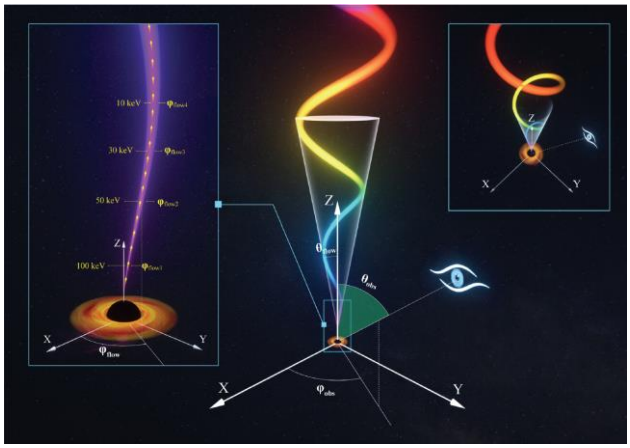

Figure 3: Schematic of the jet precession model.

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