Institute of Space Sciences

EXCELENCIA MARÍA DE MAEZTU

UAB Universitat Autònoma de Barcelona

The 2022 reactivation of the magnetar SGR J1935+2154

Abubakr Ibrahim

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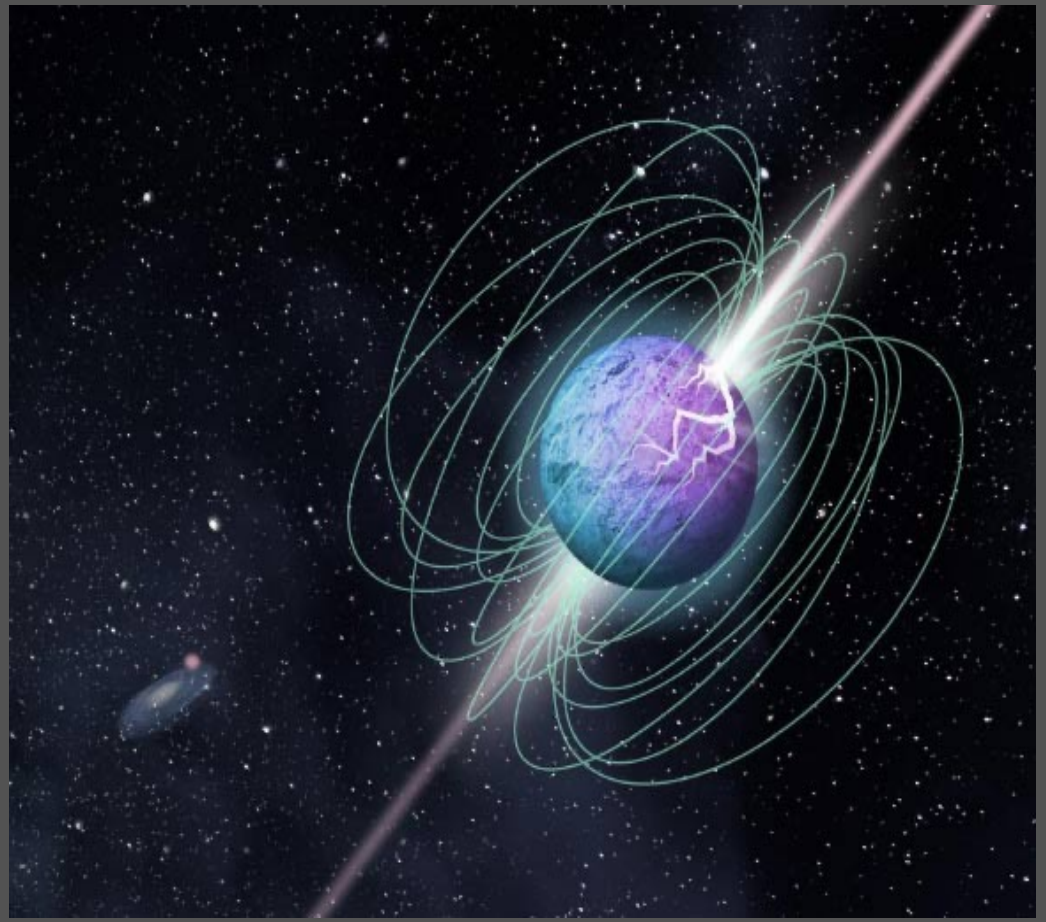
SCIENTIFIC COMMUNICATION IN ASTRONOMY

Centro Universitario di Bertinoro

October 2-6, 2023

SGR J1935+2154: A Galactic Magnetar

Associated with supernova remnant (SNR) G57.2+0.8



Credit: McGill University Graphic Design Team

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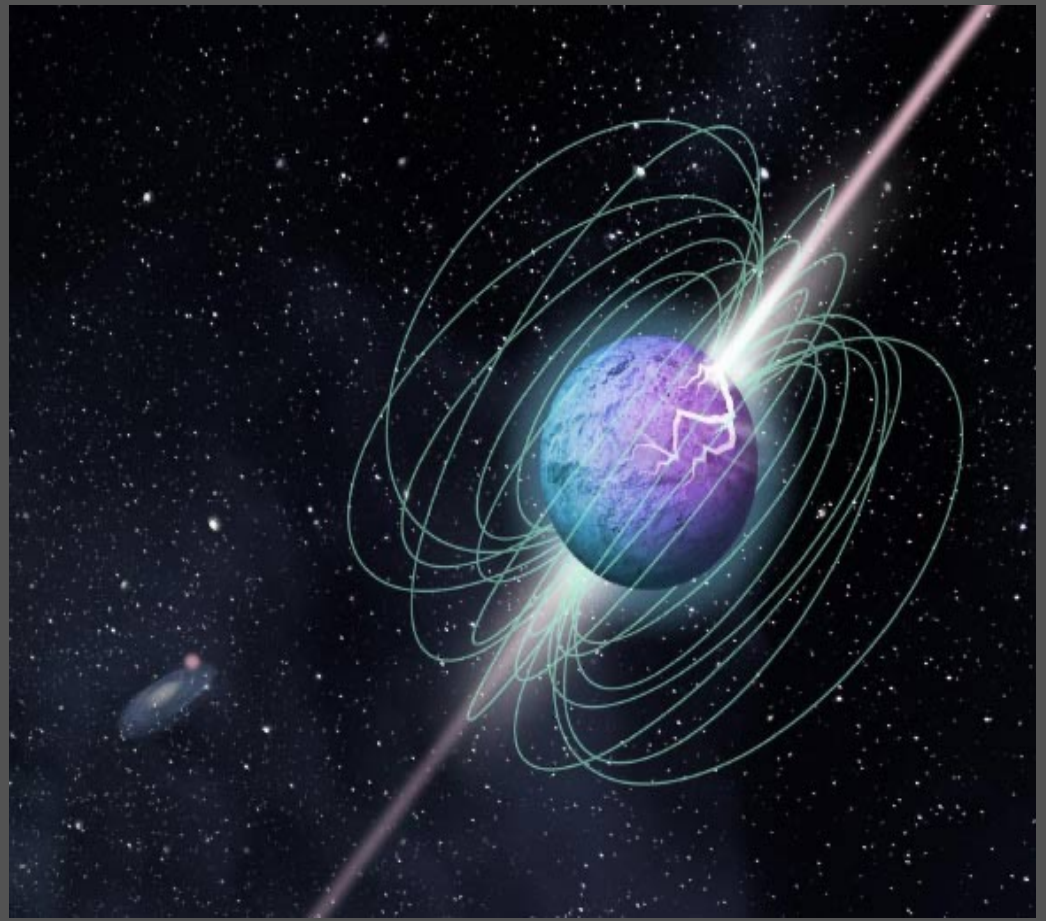
Discovered in 2014 by Swift-BAT with P = 3.24 s



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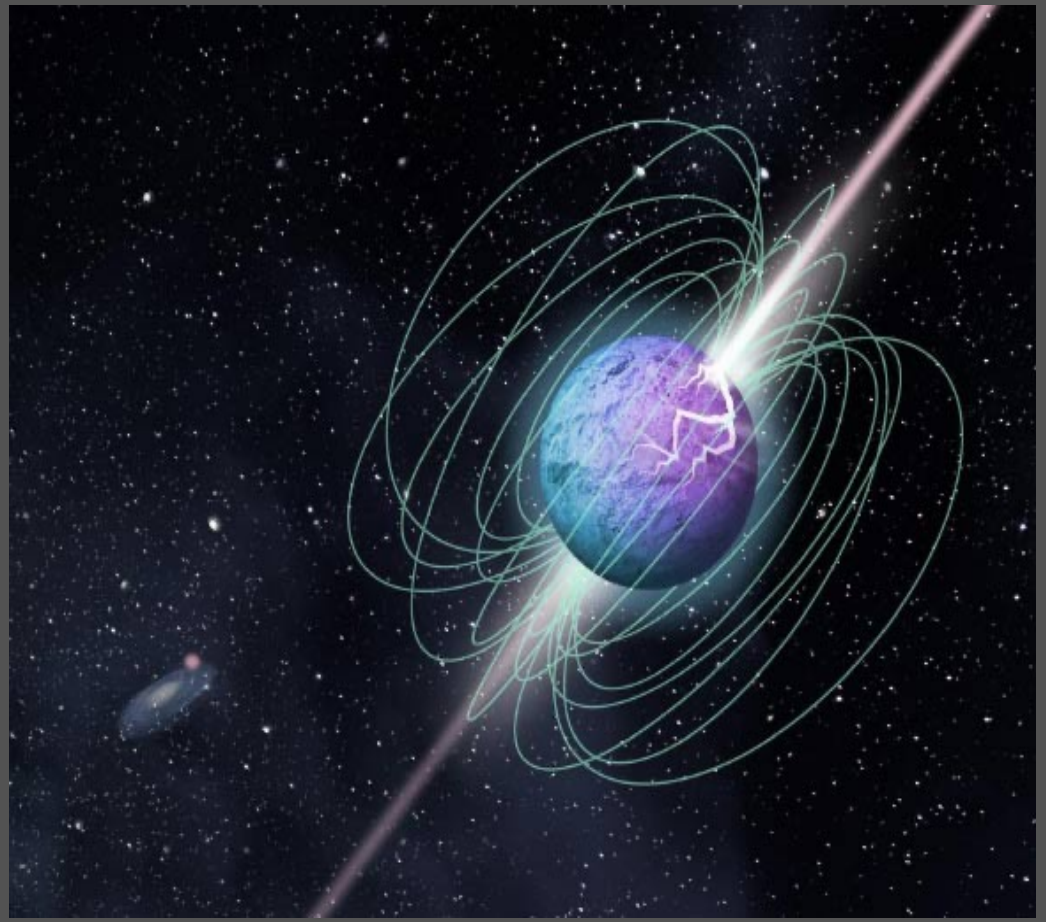
Frequent outbursts occurring nearly annually



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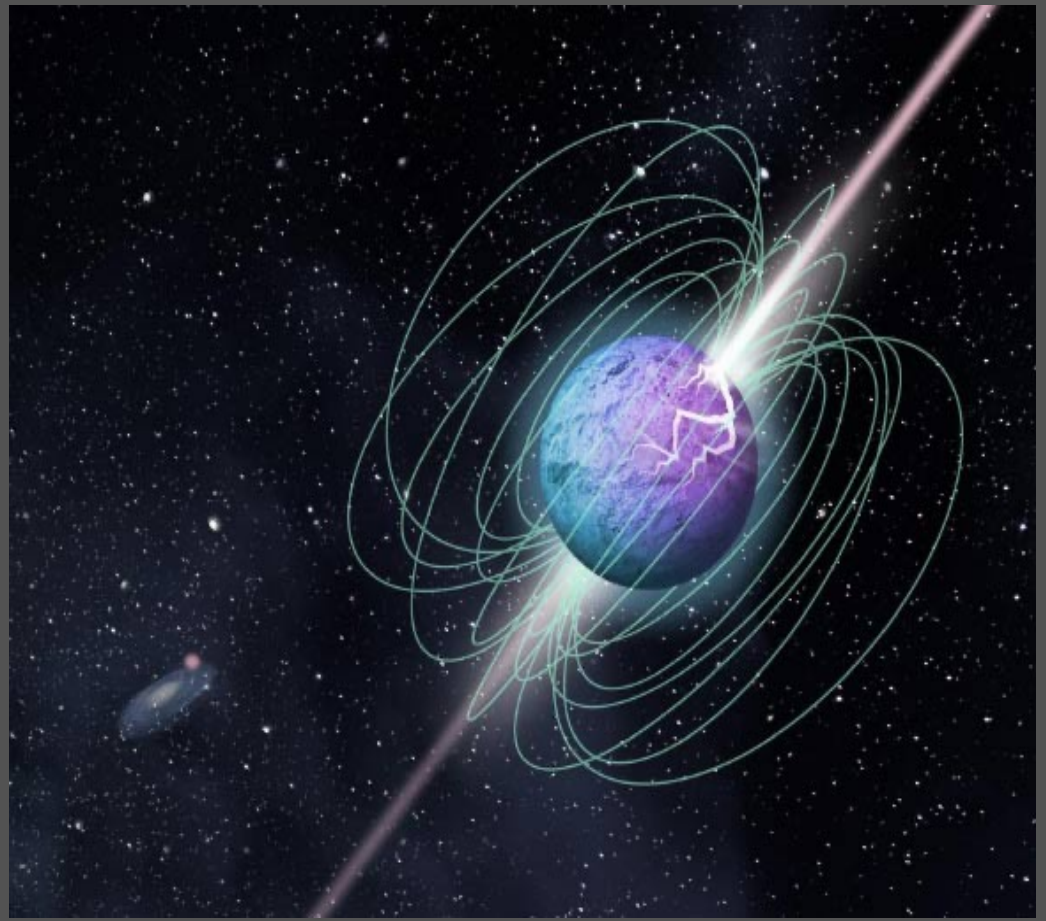
FRB: April 28, 2020-Simultaneous double-peaked radio burst and a hard X-ray burst



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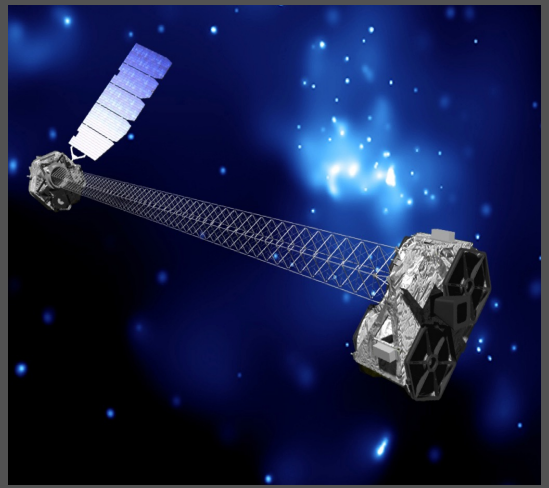
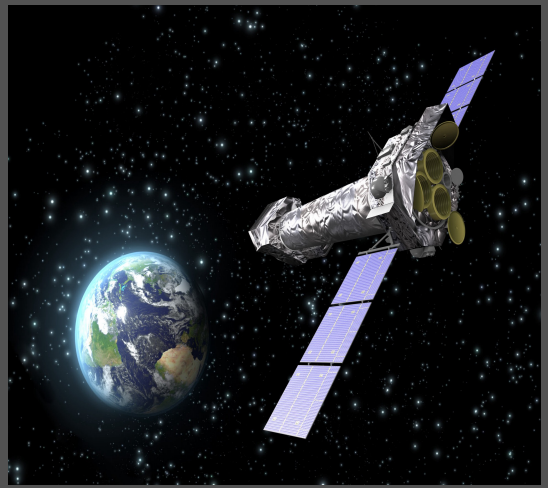
SGR J1935+2154: 2022 outburst

October 2022: a new outburst by NICER



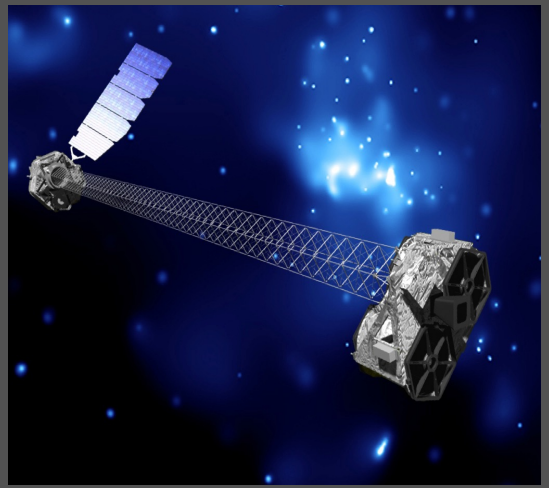


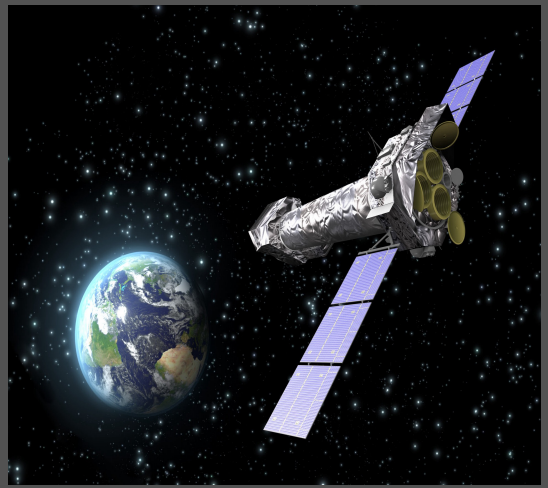
Credits: ESA-C. Carreau, NASA/JPL-Caltech

SGR J1935+2154: 2022 outburst

October 2022: a new outburst by NICER

Simultaneous observations by XMM-Newton and NuSTAR (two epochs)





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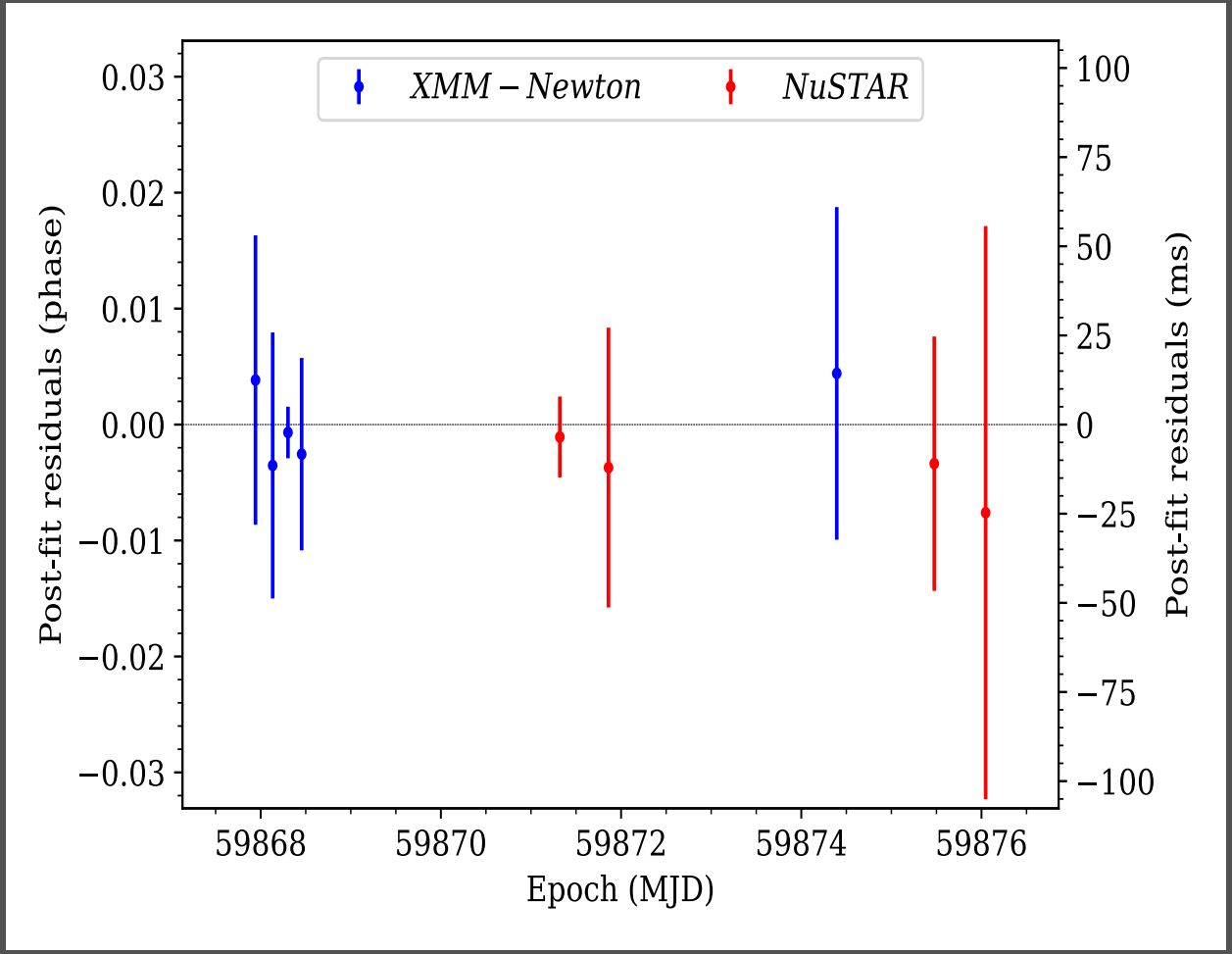
X-ray Spectral and timing results

Phase-coherent timing solution:
P = 3.25176241(5)
$P_{dot} = 5.52(5) \times 10^{-11}$



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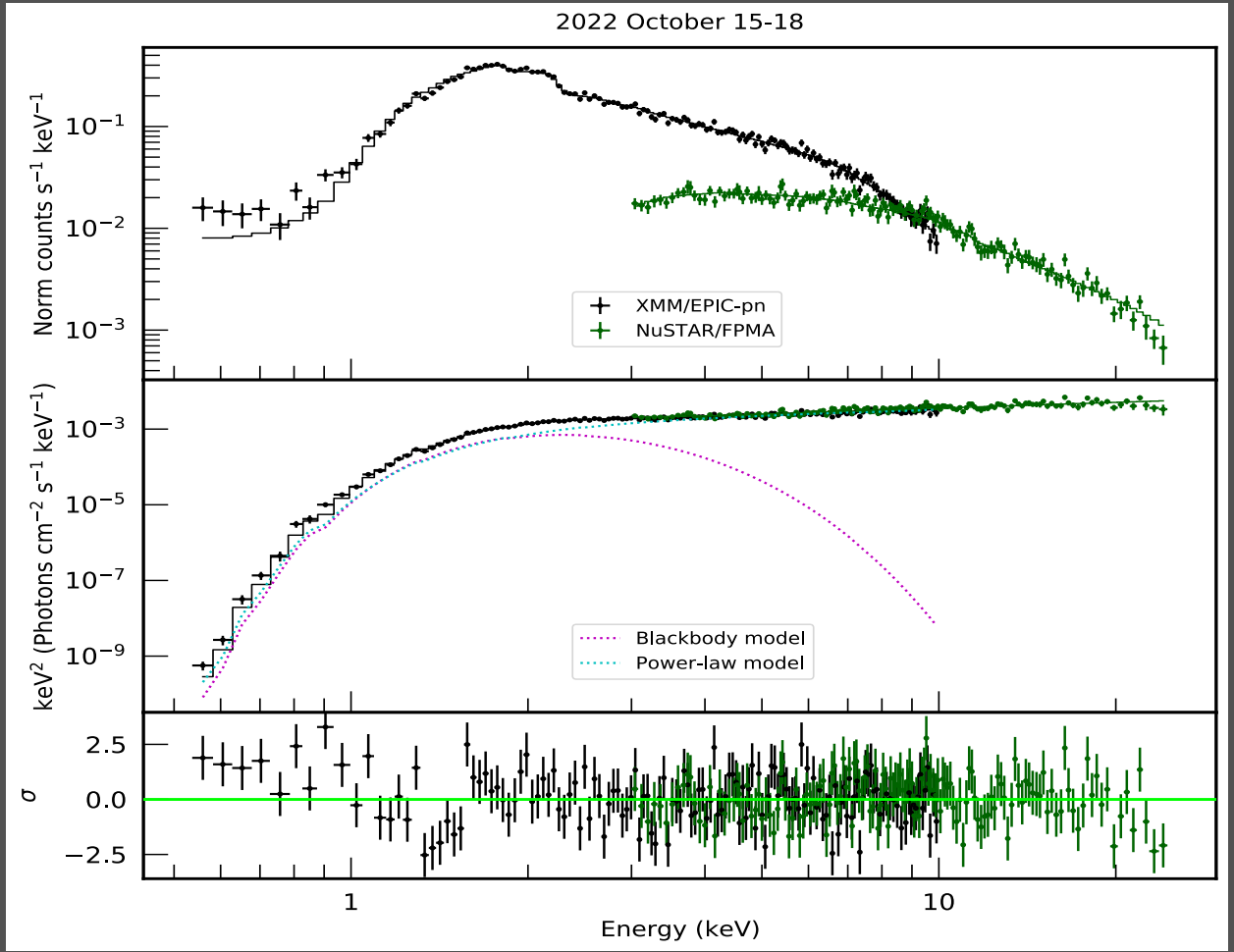
The persistent emission spectrum:
BB+PL, Energy = 25 keV.



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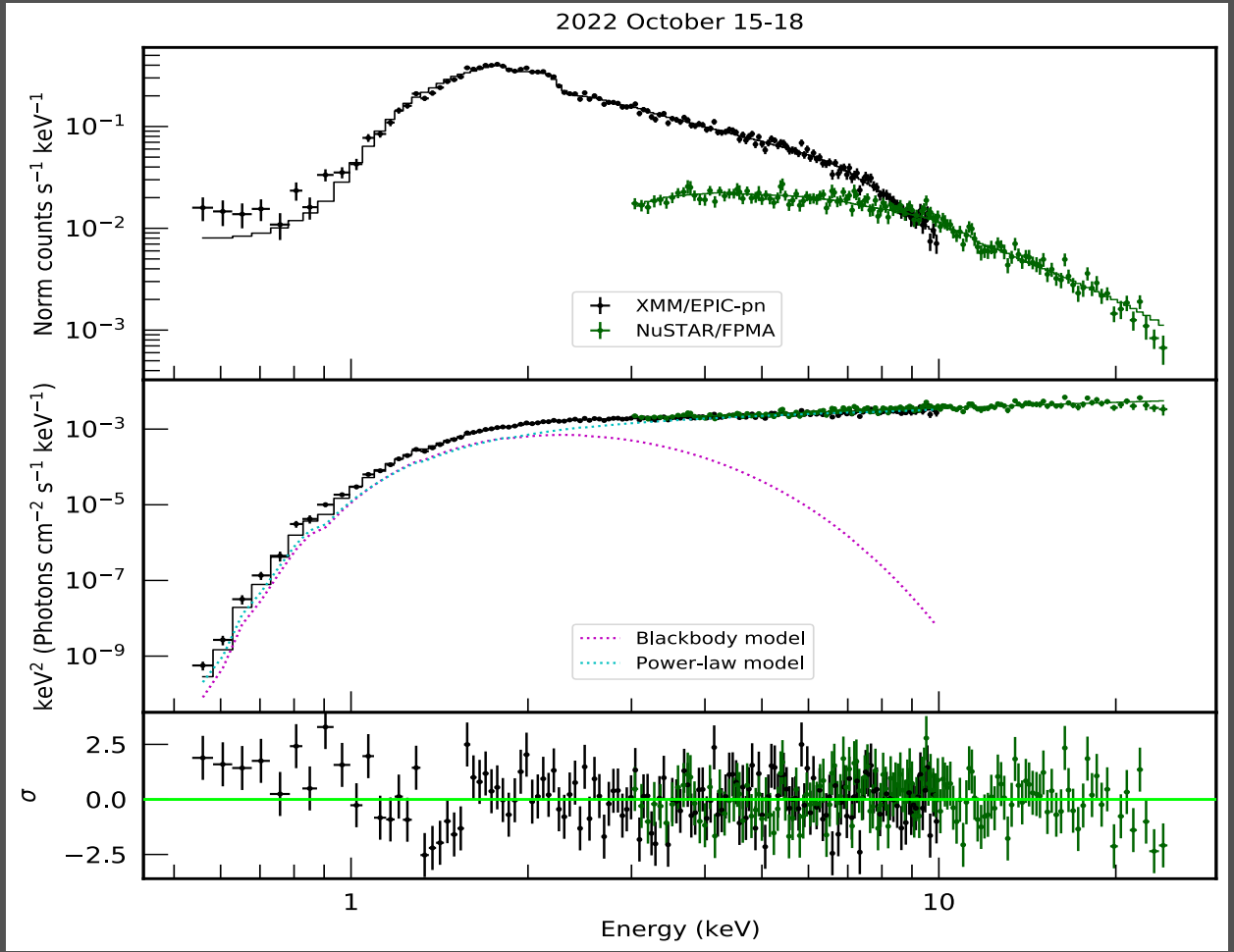

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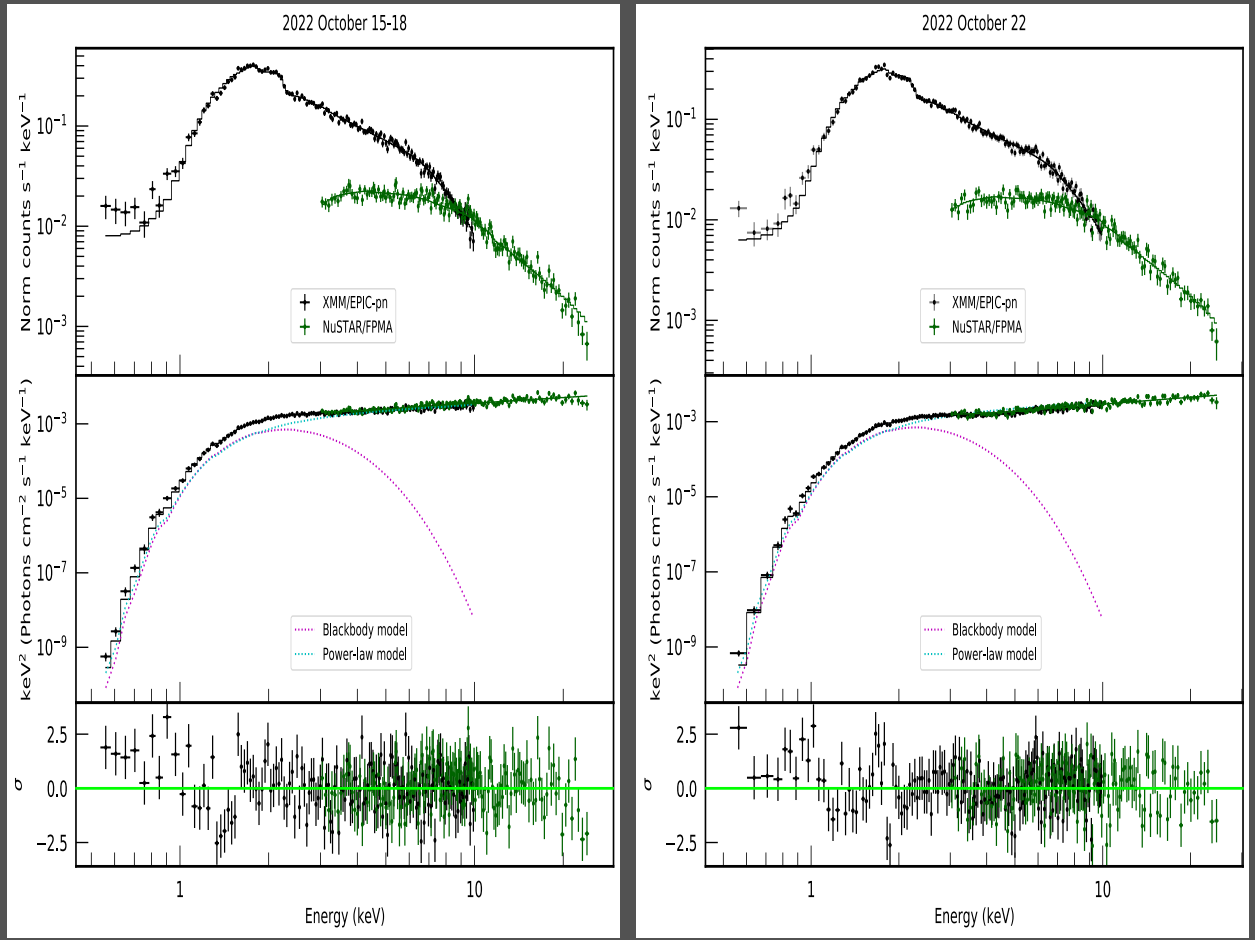
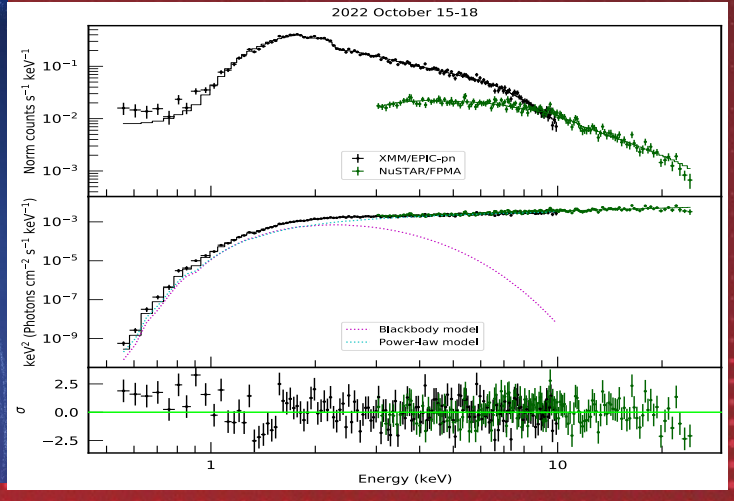
No significant changes in the blackbody temperature (kTBB ≈ 0.4 keV)



Conclusion



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