IGR J17451-3022: dips, eclipses and warm absorber

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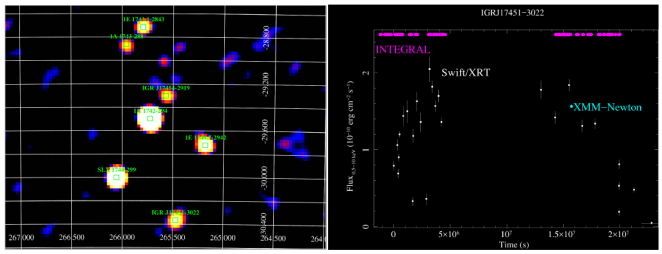
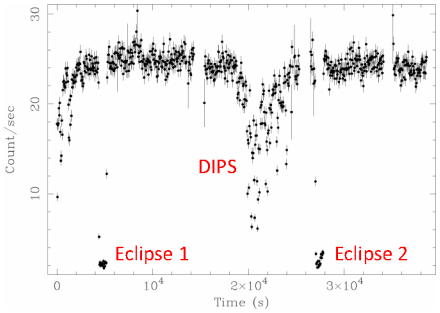
(on behalf of a large collaboration – please see references below)

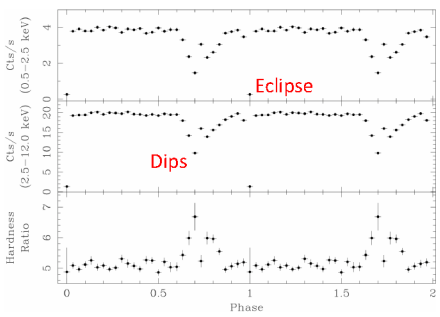
IGR J17451-3022 was discovered by INTEGRAL on 2014 August 22 during the observations performed in the direction of the Galactic Bulge. Our monitoring campaign with INTEGRAL, Swift, and XMM-Newton revealed that this source was a newly discovered low mass X-ray binary (LMXB) showing ECLIPSES, DIPS, and the presence of a WARM ABSORBER with evidences of outflows at a velocity of ~2200 km/s. The measured orbital period of the binary is 22620.5 (+2.0, -1.8) s at 1 σ confidence level.

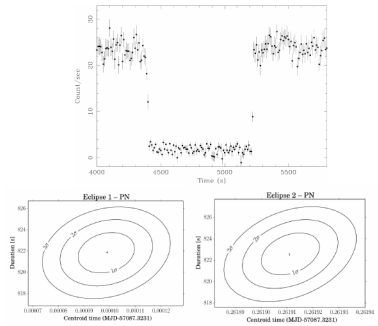
THE OUTBURST



THE XMM-Newton LIGHTCURVE



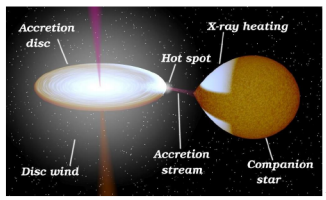


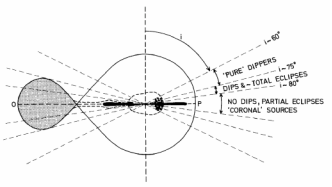


THE ECLIPSES

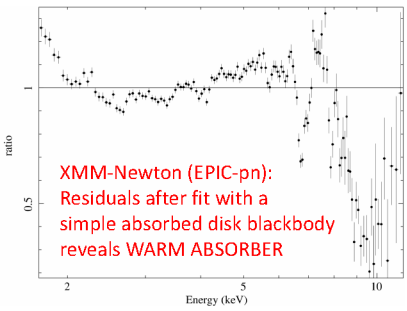
THE DIPS

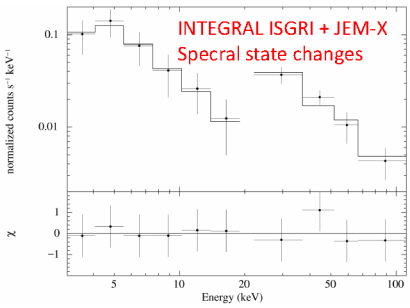
THE NATURE OF THE COMPACT OBJECT

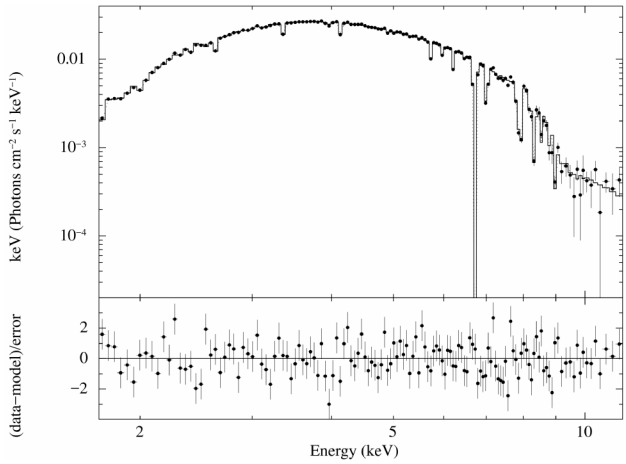




THE X-RAY SPECTRUM







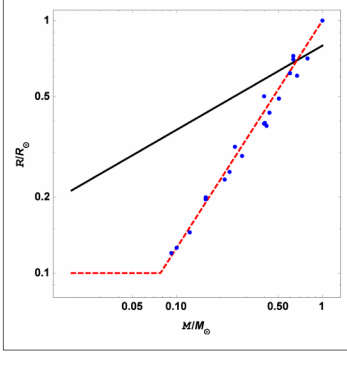
THE SPECTRUM DURING ECLIPSES

SPECTRAL STATE CHANGES DURING THE OUTBUST

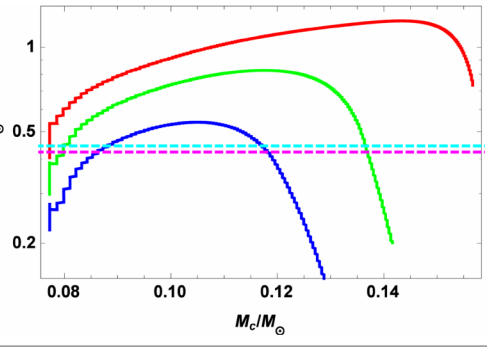
THE WARM ABSORBER

Parameter (units)	Value: Steady emission	Value: Dips
TBABS		
N_H (10^{22} cm^{-2})	$5.42^{+0.09}_{-0.09}$	$5.86^{+0.08}_{-0.29}$
EDGE		
E_{edge} (keV)	$8.14^{+0.06}_{-0.03}$	$8.14^{\dagger}$
τ	$0.45^{+0.07}_{-0.09}$	$0.44^{\dagger}$
WARMABS		
N_H^{warm} (10^{22} cm^{-2})	113^{+39}_{-29}	160^{+6}_{-10}
log(ξ) (erg cm s^{-1})	$4.02^{+0.03}_{-0.03}$	$3.87^{+0.08}_{-0.08}$
Si	$1.96^{+0.23}_{-0.37}$	$3.2^{+0.9}_{-0.5}$
S	$0.58^{+0.17}_{-0.11}$	$4.0^{+1.0}_{-1.0}$
Ar	$1.14^{+0.32}_{-0.25}$	$0.1^{+0.4}_{-0.1}$
Ca	$1.17^{+0.37}_{-0.28}$	$0.4^{+0.6}_{-0.3}$
K	$0^{\dagger\dagger}$	$0^{\dagger}$
Cr	$0.77^{+0.17}_{-1.00}$	$0.3^{+1.0}_{-0.3}$
Mn	$0.57^{+0.56}_{-0.30}$	$1.0^{+2.8}_{-1.0}$
Fe	$1.74^{+0.14}_{-0.11}$	$1.4^{+0.2}_{-0.2}$
σ_v (km s^{-1})	290^{+39}_{-32}	295^{+41}_{-42}
v (km s^{-1})	2231^{+60}_{-162}	1615^{+92}_{-34}
GAUSSIAN		
E_6 (keV)	$6.20^{+0.04}_{-0.03}$	$6.20^{\dagger}$
σ_6 (keV)	$0^{\dagger}$	$0^{\dagger}$
EW_6 (keV)	$-0.020^{+0.009}_{-0.008}$	$-0.015^{+0.009}_{-0.007}$
GAUSSIAN		
E_7 (keV)	$5.71^{+0.02}_{-0.03}$	$5.71^{\dagger}$
σ_7 (keV)	$0^{\dagger}$	$0^{\dagger}$
EW_7 (keV)	-0.017 ± 0.007	$-0.017^{+0.003}_{-0.005}$
DISKBB		
kT_{diskbb} (keV)	$1.252^{+0.004}_{-0.004}$	1.21 ± 0.01
N_{diskbb}	$11.49^{+0.04}_{-0.16}$	$12.6^{+1.4}_{-1.5}$
$F_{0.5-10\ keV}$ (Unabsorbed flux†††)	$1.564^{+0.033}_{-0.011}$ (5.6)	$1.17^{+0.02}_{-0.02}$ (5.3)
χ^2/ν (d.o.f)	1.32 (121)	0.99 (107)

THE NATURE OF THE COMPANION



A MAIN SEQUENCE DONOR STAR



A STRIPPED GIANT DONOR STAR

REFERENCES

Enrico Bozzo, Pierre Ferrigno, Lucas Kellenberger, Laurent Chaintreuil, Vanessa Mikles, Nicolas Produit, Carlo Ferrigno, Andrea Tramacere, Jean-Pierre Ponchet, Jean-Luc Sauvageot, Jérôme Rodriguez, Pierre Kretschmar, Alexander Lutovinov, Sergey Sazonov, Rashid Sunyaev, Roland Walter, Pierre Chanial, Nicolas Gehrels, Neil Gehrels, Peter Jean, Jean Knodlseder, Jean Roques, Roland Diehl, Volker Schönfelder, Andrew Strong, Thierry Courvoisier, Christoph Winkler, Peter Ubertini, Angela Bazzano, Pietro Ubertini, Sergey Grebenev, Mikhail Gilfanov, Eugene Churazov, Marat Gilfan