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New Galactic Center X-ray Transient Detected by Swift

SWIFT J174540.7-290015

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New Galactic Center X-ray Transient Detected by Swift: SWIFT J174540.7-290015

ATel #8649; *Mark Reynolds (Michigan), Jamie Kennea (Penn State), Nathalie Degenaar (Cambridge), Rudy Wijnands (Amsterdam), Jon Miller (Michigan) on behalf of a larger collaboration.*

on 7 Feb 2016; 20:04 UT

Credential Certification: *Mark Reynolds (markrey@umich.edu)*

Subjects: Radio, Infra-Red, X-ray, Request for Observations, Binary, Neutron Star, Soft Gamma-ray Repeater, Transient

Referred to by ATel #: [8684](#), [8689](#), [8729](#), [8737](#), [8746](#), [8793](#), [9109](#), [9196](#), [9236](#), [9551](#)

We report on our ongoing Swift monitoring observations of the Galactic center (Degenaar et al. 2015). In the first Swift observation after the GC exited the solar constraint window, a new X-ray source is detected in a ~ 1 ks observation on MJD 57424.87742 (t_{start} : 160206 @21:02UT), at a position of

RA (J2000): 17 45 40.74 (266.41974)

Dec (J2000): -29 00 14.7 (-29.00407)

90% Error radius: 2.2"

This lies approximately 16" to the north of Sgr A* and the magnetar SGR J1745-29. This observation also reveals the eclipsing neutron star transient AX J1745.6-2901 (Degenaar & Wijnands 2009, 2010) to remain active over 2.5yrs since the onset of the current outburst (ATEL #[5222](#), #[5226](#)).

Extracting a spectrum from a circular region ($r=20''$) centered on this source and background from an annular region 28"-37" from the source position, we measure a net count rate of 0.50 ± 0.02 ct/s. Assuming a constant column of $N_{\text{H}} = 9.1e22 \text{ cm}^{-2}$, the resulting spectrum is equally well characterized by both a power-law ($\gamma=0.60 \pm 0.26$) and blackbody ($kT=2.1 \pm 0.4 \pm 0.3$ keV, $\text{norm}=0.9 \pm 0.4 \pm 0.3$, implying an emission radius of approx. 1.2 km at 8 kpc) model. Assuming a distance of 8 kpc, the source luminosity is $7.9e35 \text{ erg/s}$ (2 - 10 keV). The observed spectrum would favor a transient accreting neutron star or magnetar interpretation for this source. The observed spectral shape is inconsistent with that observed from a typical accreting black hole.

Related

- 13839 [Renewed activity of the Galactic center transient Swift J174535.5-285921 seen with Swift/XRT](#)
- 13683 [Swift/XRT detects a new outburst of the Galactic Center transient GRS 1741.9-2853](#)
- 13453 [Swift/XRT detects \(continued\) activity of the Galactic center transient AX J1745.6-2901](#)
- 13150 [Swift/XRT detects a new outburst of the Galactic Center transient AX J1745.6-2901](#)
- 11263 [Swift resumes X-ray monitoring observations of the Galactic center in 2018](#)
- 10900 [Swift/XRT detects activity of a very-faint X-ray transient, likely the neutron star X-ray binary AX J1745.6-2901, near Sgr A*](#)
- 10859 [Swift/XRT detects a new accretion outburst of the Galactic center neutron star transient GRS 1741-2853](#)
- 10671 [MAXI/GSC detection of a weak X-ray outburst from RX J1709.5-2639 \(XTE J1709-267\)](#)
- 10323 [Swift/XRT detects renewed activity of the Galactic center transient AX J1745.6-2901](#)
- 10089 [Swift resumes X-ray monitoring observations of the Galactic center in 2017](#)
- 9551 [Swift/XRT detects renewed activity of the Galactic center transient XMM J174457-2850.3](#)
- 9236 [Swift/XRT detects renewed activity of the Galactic center X-ray transient Swift J174535.5-285921](#)
- 9196 [Continued Swift/XRT observations of the new Galactic center transients SWIFT J174540.2-290037 and](#)

Inspection of the source lightcurve does not reveal the presence of pulsations, though the observation was acquired in PC mode ($\Delta t = 2.5$ s), thus limiting our ability to detect rapid coherent pulsations.

We note the presence of two catalogued CXO sources in the immediate vicinity of this source.
CXOU J174540.1-290016
CXOGC J174540.0-290014

Chandra observations have determined CXOGC J174540.0-290014 to be a (very-faint) X-ray transient (Muno et al. 2005). However, at the current time, we cannot firmly associate this source with either of the above sources and as such it is possible that the detected source is a newly active Galactic center transient, which we designate SWIFT J174540.7-290015.

Follow-up observations are encouraged to determine the nature of this source.

The Swift/XRT Galactic Center monitoring campaign website can be found at: <http://www.swift-sgra.com>

References:

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Degenaar & Wijnands 2010, A&A 524, 69
Degenaar et al., 2015, JHEAp, 7, 137
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