



**UvA-DARE (Digital Academic Repository)**

**Continued Swift Monitoring of the Galactic Center Flare**

Reynolds, M.T.; Degenaar, N.; Miller, J.M.; Kennea, J.A.; Wijnands, R.

*Published in:*  
The astronomer's telegram

[Link to publication](#)

*Citation for published version (APA):*  
Reynolds, M. T., Degenaar, N., Miller, J. M., Kennea, J. A., & Wijnands, R. (2013). Continued Swift Monitoring of the Galactic Center Flare. *The astronomer's telegram*, 5016.

**General rights**

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

**Disclaimer/Complaints regulations**

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

*UvA-DARE is a service provided by the library of the University of Amsterdam (<http://dare.uva.nl>)*

24 Jun 2014; 09:04 UT

## Outside

GCN  
IAUCs

## Other

ATel on [Twitter](#) and [Facebook](#)  
ATELstream  
ATel Community Site  
MacOS: [Dashboard Widget](#)This space for free for your  
conference.IAU Symposium 305  
Polarimetry: From the Sun to  
Stars and Stellar  
Environments  
Costa Rica  
Nov 30-Dec 5 2014[ [Previous](#) | [Next](#) | [ADS](#) ]

## Continued Swift Monitoring of the Galactic Center Flare

ATel #5016; *M. T. Reynolds, N. Degenaar, J. M. Miller (Michigan), J. A. Kennea (Penn State), R. Wijnands (Amsterdam) on behalf of a larger collaboration*  
on 26 Apr 2013; 20:36 UT  
Credential Certification: [Mark Reynolds \(markrey@umich.edu\)](mailto:markrey@umich.edu)

Subjects: Radio, Infra-Red, X-ray, AGN, Black Hole, Transient

Referred to by ATel #: [5222](#)

We report the result of a long Swift observation of the galactic center flaring source (atel #[5006](#), #[5008](#), #[5011](#), #[5013](#), #[5014](#)) undertaken last night (2013-04-25; obsid: 00554491001; Exptime: 11.2 ks). Continued elevated X-ray emission consistent with the position of Sgr A\* is detected, where a count rate of 0.095 $\pm$ 0.003 ct/s is measured from a 10" radius region centred on the radio position of Sgr A\*.

The measured intensity is consistent with a roughly constant level of approximately 0.1 ct/s over the past 48 hrs from this source, e.g., atel #[5006](#).

Extracting the source spectrum from this region and background from an annulus extending from 20"-50" from the position of Sgr A\*, we have a total of 1060 net counts. All fits are reported in the 2-10 keV bandpass and errors where quoted are at the 90% confidence level.

The source spectrum is intrinsically soft and thermal-like. Fixing the column density to that measured towards Sgr A\* (9.1e22 cm<sup>-2</sup>), we find curved residuals when the spectrum is fit with a power-law (Gamma ~ 2). Allowing the column density to vary results in an improved fit but the resulting spectral tends towards Gamma ~ 4.

Our nominal best fit model is a simple blackbody

Nh: 9.1e22 cm<sup>-2</sup>  
kT: 1.06 $\pm$ 0.06 keV  
norm: (4.1 $\pm$ 0.2)e-4

though alternative models that naturally produce curvature in the 2 -- 10 keV band pass also return acceptable fits, e.g., Bremsstrahlung. The normalization implies an emission region with a radius of ~ 16m (d/8kpc)<sup>2</sup>.

The spectrum does not reveal any evidence for the presence of Fe K emission intrinsic to the source, suggesting the tentative Fe K line detection reported in atel #[5011](#) originates in the diffuse gas that permeates the GC region, e.g., Baganoff et al. (2003), Nowak et al. (2012).

Inspection of the lightcurve reveals the source to be highly variable, with typical variations at the 10% level. There is no evidence for any periodicity and/or eclipses as might be expected from an X-ray binary in the lightcurve. The resulting power spectrum is featureless and consistent with

## Related

- [6083](#) Sgr A\* at 22 GHz around the G2 peri-center passing with Japanese VLBI Network
- [6004](#) Progress Report of the Monitor of Sgr A\* with Japanese VLBI Network at 22 GHz until 2014/76
- [5969](#) NRAO VLA service monitoring observations of Sgr A\*
- [5861](#) Continued Swift/XRT monitoring observations of the Galactic center
- [5847](#) Swift/XRT observations of the Galactic center have resumed
- [5727](#) NRAO VLA service monitoring observations of Sgr A\*
- [5649](#) Fermi-LAT Gamma-ray Observations of Nova Centauri 2013
- [5545](#) NRAO VLA service monitoring observations of Sgr A\*
- [5332](#) Report on (non-)activity in the Galactic bulge region as seen by INTEGRAL
- [5319](#) MAXI/GSC detection of a new X-ray outburst from RX J1709.5-2639(=XTE J1709-267)
- [5301](#) A new outburst from LMXB 1A 1744-361
- [5254](#) Swift detection of a third burst from SGR J1745-29
- [5246](#) Swift/XRT detects activity of the Galactic center transient GRS 1741-2853
- [5241](#) MAXI/GSC detection of a renewed outburst from the black hole candidate H 1743-322
- [5226](#) New Swift/XRT observations confirm that the active Galactic center transient is AX J1745.6-2901
- [5222](#) Swift/XRT monitoring observations detect an active X-ray transient near the Galactic center
- [5184](#) Report of the Daily Monitor of Sgr A\* at 22 GHz
- [5163](#) Limits on Low Frequency Radio Flux Density Changes for Sgr A\* (erratum)
- [5159](#) Limits on Low Frequency Radio Flux Density Changes for Sgr A\*
- [5153](#) NRAO VLA service monitoring observations of Sgr A\*
- [5124](#) Swift/BAT detection of a burst from SGR J1745-29

stochastic variability from this source.

The observed spectral shape is not consistent with that typically observed from NS & BH LMXB at luminosities  $\sim 1e35$  erg/s. If this spectrum were due to emission from a NS/BH LMXB, such high temperatures are only observed from sources accreting at a significant fraction of the Eddington limit  $\sim 0.1$   $L_{\text{Edd}}$ , which implies a line-of sight source lying at a distance far in excess of the galactic center.

Given the positional coincidence with Sgr A\* and the unusual spectrum, it is possible that we are observing emission from Sgr A\* at a low Eddington fraction. If so, the current event is the longest and most energetic accretion event observed from Sgr A\* in modern times.

Definitive association of the observed X-ray emission with Sgr A\* will require high resolution X-ray observations.

-----  
Swift is carrying out a daily monitoring campaign throughout 2013 to study the evolution of the X-ray properties of Sgr A\* as it interacts with the G2 cloud (Gillessen et al., 2012, 2013). All observations are promptly analyzed and the resulting X-ray lightcurve will be made publicly available at the link below.

*[Swift Sgr A\\* monitoring Campaign Website](#)*

- 5095 Chandra confirmation of transient X-ray activity from CXOGC J174540.0-290005 north of the Galactic Center
- 5076 Detection of radio pulsations at 22 GHz from the Magnetar PSR J1745-2900 in the archival data from 2011
- 5074 Swift/XRT detection of an active X-ray transient near the Galactic center
- 5073 NuSTAR detection of a transient in outburst north of Sgr A\*
- 5070 Search for pulsed radio emission from PSR J1745-2900 at 1 GHz with the GMRT
- 5064 Polarisation profiles and rotation measure of PSR J1745-2900 measured at Effelsberg
- 5058 On-going radio observations of PSR J1745-2900 at Effelsberg, Nancay, and Jodrell Bank: flux density estimates, polarisation properties, spin-down measurement, and the highest dispersion measure measured.
- 5053 Detection by Sardinia Radio Telescope of radio pulses at 7 GHz from the Magnetar PSR J1745-2900 in the Galactic center region
- 5046 Spin-down Measurement of PSR J1745-2900: a New Magnetar
- 5043 Further radio pulsations from the direction of the NuSTAR 3.76-second X-ray pulsar, and a dispersion measure estimate.
- 5040 Detection of radio pulsations from the direction of the NuSTAR 3.76 second X-ray pulsar at 8.35 GHz
- 5037 Swift-BAT monitoring for additional bursts from SGR J1745-29 (Trigger 554491)
- 5035 Detection of radio pulsations from the direction of the Galactic center Soft Gamma-ray Repeater with Parkes and the GBT
- 5033 Searches for Dispersed Radio Pulsar Emission from the Sag A\* SGR
- 5032 Chandra localization of the soft gamma repeater in the Galactic Center region
- 5027 Searches for radio pulsations from the 3.76 second NuSTAR X-ray pulsar in the Galactic centre.
- 5025 Limits on Radio Frequency Flux Density Changes in Sgr A\*
- 5024 NICT VLBI Observations of Sgr A\* at 8 GHz and 2 GHz
- 5020 NuSTAR discovery of a 3.76 second pulsar in the Sgr A\* region
- 5018 1.3mm CARMA Flux Density for Sgr A\*
- 5016 Continued Swift Monitoring of the Galactic Center Flare
- 5014 Brightening of Sgr A\* at 32 GHz from VLA observations

<b>5013</b>	<b>Possible brightening at 22 GHz of Sgr A*</b>
<b>5011</b>	<b>Swift XRT spectrum of transient X-ray source at Sgr A*'s position</b>
<b>5009</b>	<b>Swift/BAT detection of an SGR-like flare from near Sgr A*</b>
<b>5008</b>	<b>Ongoing X-ray activity from Sgr A*</b>
<b>5006</b>	<b>Large Flare from Sgr A* Detected by Swift</b>
<b>4923</b>	<b>Non-detection of flare at 22 GHz of Sgr A* induced by the approaching G2 cloud in February and March 2013</b>
<b>4840</b>	<b>Transient X-ray burster KS 1741-293 active again</b>
<b>4471</b>	<b>1E 1740.7-2942 (the Great Annihilator) enters a low-intensity state</b>
<b>4249</b>	<b>Brightening and hardening of new X-ray transient in globular cluster Terzan 5</b>
<b>2770</b>	<b>Swift/XRT detects new outbursts of the galactic center X-ray transients GRS 1741-2853 and XMM J174457-2850.3</b>
<b>1513</b>	<b>Chandra detects Swift J174535.5-290135.6 in a relatively bright state</b>
<b>904</b>	<b>Announcement of the Swift/BAT Hard X-ray Transient Monitor</b>
<b>753</b>	<b>Swift/XRT detection of a transient source in the Galactic Center</b>

---

[ **Telegram Index** ]

R. E. Rutledge, Editor-in-Chief

Derek Fox, Editor

Mansi M. Kasliwal, Co-Editor

`rrutledge@astronomerstelegam.org`

`dfox@astronomerstelegam.org`

`mansi@astronomerstelegam.org`