



UvA-DARE (Digital Academic Repository)

The transient low-mass X-ray binary IGR J18245-2452 is again active as a radio pulsar

Papitto, A.; Hessels, J.; Burgay, M.; Ransom, S.; Rea, N.; Possenti, A.; Stairs, I.; Ferrigno, C.; Bozzo, E.

Publication date

2013

Document Version

Final published version

Published in

The astronomer's telegram

[Link to publication](#)

Citation for published version (APA):

Papitto, A., Hessels, J., Burgay, M., Ransom, S., Rea, N., Possenti, A., Stairs, I., Ferrigno, C., & Bozzo, E. (2013). The transient low-mass X-ray binary IGR J18245-2452 is again active as a radio pulsar. *The astronomer's telegram*, 5069.
<http://www.astronomerstelegam.org/?read=5069>

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 (<https://dare.uva.nl>)

Outside
 GCN
 IAUCs

Other
 ATel on [Twitter](#) and [Facebook](#)
 ATELstream
 ATel Community Site
 MacOS: [Dashboard Widget](#)

This space for free for your conference.



5th International
 Enrico
 Symposium
 Nagoya, Japan
 Oct. 20-24, 2014
 Abstracts Due Sep. 7

[[Previous](#) | [Next](#) | [ADS](#)]

The transient low-mass X-ray binary IGR J18245-2452 is again active as a radio pulsar

ATel #5069; *A. Papitto (IEEC-CSIC), J. W. T. Hessels (ASTRON/UvA), M. Burgay (INAF-OAC), S. Ransom (NRAO), N. Rea (IEEC-CSIC), A. Possenti (INAF-OAC), I. Stairs (UBC), C. Ferrigno (ISDC/U. Geneva), E. Bozzo (ISDC/U. Geneva) on behalf of a larger collaboration on 17 May 2013; 01:20 UT*

Credential Certification: E. Bozzo (enrico.bozzo@unige.ch)

Subjects: Radio, Binary, Globular Cluster, Neutron Star, Pulsar

Referred to by ATel #: [5086](#)



We have recently identified the transient low-mass X-ray binary IGR J18245-2452 in M28 (Atel [#4925](#), [#4927](#), [#4929](#), [#4934](#), [#4959](#), [#4960](#), [#4961](#), [#4964](#), [#4981](#), [#5003](#), [#5031](#), [#5045](#), [#5068](#)) as the radio pulsar J1824-2452I (hereafter M28I; see Papitto et al. 2013, arXiv:1305.3884). We have secured this identification through the XMM-Newton detection of X-ray pulsations with the same spin and orbital parameters as known from previous radio timing (see ATNF catalog: <http://www.atnf.csiro.au/research/pulsar/psrcat/> and S. Begin 2006, MSc thesis, UBC), as well as from the detection of X-ray pulsations during a type-I X-ray burst detected by Swift/XRT.

On April 29th, 2013 we started a radio monitoring campaign to pin-point the reactivation of the source as a radio pulsar. This campaign has used the Green Bank Telescope (GBT; at 2GHz), Parkes telescope (at 1.4GHz), and Westerbork Synthesis Radio Telescope (WSRT; at 1.4GHz). All telescopes were used in standard pulsar observing modes recording with the GUPPI, AFB/BPSR, and PuMaII backends respectively. Subsequent to the X-ray outburst, the radio pulsar has been detected sporadically by each of these telescopes:

UT Date-time	Telescope	Orb. phase	S/N	Flux (mJy)
2013-04-29-13:26	Parkes	0.57-0.80	-	-
2013-05-02-03:56	WSRT	0.24-0.47	7	0.05 +/- 0.03
2013-05-04-03:53	WSRT	0.59-0.76	-	-
2013-05-06-04:04	WSRT	0.96-0.18	-	-
2013-05-06-07:07	GBT	0.24-0.36	-	-
2013-05-07-02:43	WSRT	0.02-0.35	-	-
2013-05-09-10:37	GBT	0.09-0.21	-	-
2013-05-10-13:03	Parkes	0.48-0.94	12	0.06 +/- 0.03
2013-05-11-09:43	GBT	0.36-0.47	9	0.01 +/- 0.005
2013-05-13-10:22	GBT	0.77-0.89	12	0.02 +/- 0.01
2013-05-13-16:25	Parkes	0.32-0.77	8	0.05 +/- 0.03

Each radio observation was folded using a local, X-ray derived rotational ephemeris and the known dispersion measure. Although the radio detections are all weak, they are roughly consistent with the past known brightness of the radio pulsar (about 0.05mJy at 2GHz) and the S/N clearly peaks at the predicted period and dispersion measure. The flux values are in most

Related

- 5086** [Coherent Pulsations and Burst Oscillations in the Millisecond Pulsar IGR J18245-2452/PSR J1824-2452I in M28](#)
- 5069** [The transient low-mass X-ray binary IGR J18245-2452 is again active as a radio pulsar](#)
- 5068** [Burst Oscillations in the X-Ray Binary IGR J18245-2452 in M28](#)
- 5045** [A Chandra observation of the neutron-star transient IGR J18245-2452 in M28](#)
- 5031** [HST search of the region around IGR J18245-2452](#)
- 5003** [The optical counterpart to the transient IGR J18245-2452 in the globular cluster M28](#)
- 4981** [ATCA radio observation of the region around IGR J18245-2452](#)
- 4964** [Optical amateur observations of the field of IGR J18245-2452 in M28](#)
- 4961** [MAXI/GSC detected two X-ray bursts from IGR J18245-2452 in M28](#)
- 4960** [IGR J18245-2452: an accreting neutron star and thermonuclear burster in M28](#)
- 4959** [A type-I X-ray burst detected by Swift/XRT from the direction of IGR J18245-2452](#)
- 4934** [Possible 6.6-mHz modulation in IGR J18245-2452](#)
- 4929** [Swift observations of IGR J18245-2452](#)
- 4927** [IGR J18245-2452 is a new transient located in the core of the globular cluster M28](#)
- 4925** [IGR J18245-2452: a new hard X-ray transient discovered by INTEGRAL](#)
- 4924** [INTEGRAL/IBIS detects a new hard X-ray transient IGR J17446-2948 in the Galactic Center region](#)
- 4000** [INTEGRAL Galactic Bulge monitoring detects activity from XMMU J174445.5-295044 with JEM-X](#)

cases not properly calibrated and hence have large systematic uncertainties. We have marked non-detections with no S/N or Flux value.

Given the known, irregular eclipses in M28I, it is likely that non-detections at orbital phases close to 0.25 (superior conjunction of the pulsar) are due to eclipsing. Thus, we caution that non-detections are not constraining as to whether the radio pulsar was active at that time.

Most importantly these detections clearly show that the source is visible as a radio pulsar only ~5 weeks after the peak in the X-rays (Atel #4929). IGR J18245-2452/M28I conclusively shows that such systems switch back and forth between accreting binary and radio pulsar - on surprisingly short timescales (see Papitto et al. 2013, arXiv:1305.3884 for further details).

We are further investigating the behavior of this system via archival analysis and continued monitoring with the GBT.

Plots of our detections are available here: <http://www.astron.nl/~hessels/IGRJ18245-2452/>

[**Telegram Index**]

R. E. Rutledge, Editor-in-Chief

`rrutledge@astronomerstelegam.org`

Derek Fox, Editor

`dfox@astronomerstelegam.org`

Mansi M. Kasliwal, Co-Editor

`mansi@astronomerstelegam.org`