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**Optical Spectroscopy of IGR J1732-2731 with SOAR**

*A Symbiotic Binary?*

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## Optical Spectroscopy of IGR J1732-2731 with SOAR: A Symbiotic Binary?

ATel #10685; *A. Bahramian, J. Strader (MSU), C. O. Heinke, G. R. Sivakoff (Alberta), J. A. Kennea (PSU), N. Degenaar, R. Wijnands (Amsterdam), on behalf of a larger collaboration on 30 Aug 2017; 17:39 UT*

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Subjects: Optical, X-ray, Binary, Black Hole, Neutron Star, Transient

Referred to by ATel #: [11273](#)

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IGR J1732-2731 is a new transient discovered by INTEGRAL (ATels [#10644](#), [#10645](#), [#10653](#)) in the Galactic bulge. The source has been observed by Swift/XRT since its discovery (ATel [#10645](#)). Using Swift/XRT online analysis tool (Evans et al. 2009, MNRAS, 397, 1177) the UVOT-enhanced position of IGR J1732-2731 is:

RA: 263.21088 (17:32:50.61)

Dec: -27.50065 (-27:30:02.3)

with radial error of 2.1" (90% confidence).

Russell et al. (ATel [#10682](#)) identify multiple candidate counterparts for this source and identify star 3 in their analysis as the most likely counterpart. Star 3 is ~1" from the XRT coordinates, within the error circle. We took optical spectrum of Star 3 with the SOAR/GOODMAN spectrograph on Aug 25, 2017. The spectrum is consistent with an M-type star, with numerous strong emission lines (spectrum plot attached).

After nominal correction for the large foreground reddening (note the spectrum in the attached plot is not corrected for extinction), the strongest emission lines are from H I, O I 8446 and [O III] 4959/5007. Emission from several lines of He I, [O I] 6300, and (likely) [Fe VII] 6087 are also present.

The rapid X-ray variability, strong optical emission lines that include H-alpha and [O III], and the cool nature of the companion (which implies it may be a giant) all suggest a symbiotic star (containing a white dwarf accretor) or a symbiotic X-ray binary (containing a neutron star or black hole accretor) as another possibility for the nature of this system.

*SOAR spectrum of IGR J1732-2731*

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