"The prototype symbiotic star AX Per is in outburst"

ATel #6382; U. Munari (INAF Padova-Asiago), S. Dallaporta, G. L. Righetti, F. Castellani, G. Cherini (ANS Collaboration)
on 11 Aug 2014; 14:02 UT
Credential Certification: U. Munari (ulisse.munari@oapd.inaf.it)

Subjects: Optical, Cataclysmic Variable, Nova

The prototype symbiotic star AX Per is in outburst. This is the third such event
in the current series of outbursts, the previous two peaking at V=10.41 on 2009
May 26 and at V=10.03 on 2012 Aug 28, according to ANS Collaboration intensive monitoring. The previous active phase of AX Per lasted from 1988 to 1990 according to the AAVSO International Database. Our most recent measurement of AX
Per is for August 4.1 and recorded the star at V=10.573, U-B=-0.32, B-V=+0.80, V-Rc=+1.07, V-Ic=2.33. Our monitoring traces the onset of the current outburst to 2014 Mar 15 and provides as mean values for the preceding year-long quiescence V=11.38, U-B=+0.34, B-V=+1.25, V-Rc=+1.26, V-Ic=+2.92.

em line	lambda Ang	flux 2013-11-06	flux 2014-08-07
[NeV]	3426	1.42(-12)	5.30(-13)
[NeIII]	3869	4.77(-13)	1.08(-12)
[OIII]	4363	5.73(-13)	8.87(-13)
HeII	4686	1.59(-12)	3.00(-12)
Hbeta	4861	2.55(-12)	8.97(-12)
[OIII]	5007	5.85(-13)	2.17(-12)
HeI	5876	4.68(-13)	2.18(-12)

The current rise in brightness has been accompanied by large spectroscopic changes. Our last fluxed spectrum of AX Per has been obtained on 2014 Aug 8.0 UT
with the Asiago 1.22m telescope and covers the 3300-8000 Ang range at 2.3 Ang/pix scale. Integrated absolute fluxes (in erg cm-2 sec-1) of representative
emission lines are listed in the Table above , where the same lines have also been measured on a similar spectrum from 2013 Nov 6.8 UT, representative of typical quiescence conditions prior to the current outburst. Compared with quiescence conditions (a) the M giant spectrum is now veiled up to redder wavelengths by a hot continuum, (b) the Balmer continuum is now in prominent emission, (c) the ionization degree has declined, (d) a larger volume of M giant
wind is now ionized by the radiation from the hot companion. In addition to the
disappearance of [FeVII] lines and weakening of [NeV], on the 2014 spectrum the
HeI/HeII, H/HeII and [NeIII]/[NeV] ratios are much larger than in 2013. Hbeta flux has increased by 3.5 times while the nebular-to-auroral line ratio of [OIII] 5007/4363 has increased from 1.02 to 2.45, suggesting the ionization front to have expanded within the M giant wind, reaching external regions characterized by lower densities.