

Central Bureau for Astronomical Telegrams

INTERNATIONAL ASTRONOMICAL UNION

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AX PERSEI

U. Munari and A. Siviero, Istituto Nazionale di Astrofisica, Padova Astronomical Observatory; and S. Dallaporta, G. Cherini, P. Valisa, F. Castellani, A. Frigo, A. Vagnozzi, S. Bacci, G. Righetti, S. Moretti, and S. Tomaselli, "Asiago Novae and Symbiotic Stars" (ANS) collaboration, report that the symbiotic star AX Per is undergoing a brightening phase. The monitoring carried out with several ANS-collaboration telescopes recorded AX Per to be still in quiescence at $B = 12.56$, $B-V = +1.08$, $V-I_c = +3.03$ on 2009 Feb. 28, when it started a rapid increase in brightness that took it to $B = 12.07$, $B-V = 0.86$, $V-I_c = 2.68$ by Mar. 12, and to $B = 11.55$, $B-V = +0.82$, $V-I_c = +2.43$ by Apr. 1. Such a bright state has not been reached after the major outburst that AX Per underwent between 1988 and 1992 (cf. IAUcs 4544, 4621, 4922, 4994). Other major outbursts occurred around 1888, 1925, 1950, and 1978, according to the historical lightcurve compiled by Skopal et al. (2001, A.Ap. 367, 199). Absolute optical spectrophotometry of AX Per was obtained during the recent event with the 0.60-m telescope of the Schiaparelli Observatory in Varese and the 1.22-m telescope of the Asiago Astrophysical Observatory. The spectrum for 2009 Apr. 1 is characterized by a very strong and high-ionization emission-line spectrum, superimposed on the M giant absorption spectrum, which is veiled shortward of 500 nm by the blue continuum from circumstellar nebular material. On this Apr. 1 spectrum, the integrated flux of H β emission is $6.3 \times 10^{(-12)}$ erg cm $^{(-2)}$ s $^{(-1)}$, and the flux ratios (H β):(He II 468.6-nm):(He I 587.6-nm):([O III] 500.7-nm) are 1.00:0.76:0.61:0.37; the corresponding average values in quiescence are $4.5 \times 10^{(-12)}$ erg cm $^{(-2)}$ s $^{(-1)}$ and 1.00:0.47:0.27:0.13 (Mikolajewska and Kenyon 1992, A.J. 103, 579). Thus, the current event is characterized by a large increase in both the intensity and ionization conditions of the emission-line spectrum, with a larger fraction of the circumstellar gas being ionized by the radiation field of a hotter and more luminous central source. This extra nebular continuum is responsible for the brightness increase and "bluing" of the colors. Quite similar photometric and spectroscopic conditions characterized the short-duration flare that AX Per underwent about one year before the onset of major 1988-1992 outburst, according to the data presented by Mikolajewska and Kenyon (op.cit.).

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