

FG SAGITTAE: THE *s*-PROCESS EPISODE*

(Abstract**)

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The spectrum of the supergiant FG Sge has been studied from a series of high dispersion 120-in. coude spectrograms obtained during the interval 1969–72, thus continuing the work of Herbig and Boyarchuk (1968). The star, of effective temperature about 6500 K in 1972, is cooling at the rate of 250 K yr^{-1} ; it is known to have ejected a still visible planetary nebula some 6000 years ago (Flannery and Herbig, 1973). Abnormally strong absorption lines of Y II, Zr II, Ce II, La II and other *s*-process species began to appear in the spectrum of the central star some time after 1967 and have progressively strengthened. Present abundances per gram of these elements are about 25 times the solar value. There is little doubt that the atmosphere of the star has been enriched in these elements during the past seven years, but the rate of enrichment now appears to be slowing down.

The present evolutionary state of FG Sge, referred to as the Herbig-Boyarchuk (HB) phase, is discussed qualitatively on the basis of two model scenarios: (1) the HB phase is a post-planetary ejection episode associated with a He shell flash experienced by all stars with masses near $1 M_{\odot}$; (2) the HB phase is a transient post-helium shell flash phenomenon in a more massive red giant, immediately preceding its transformation into a Ba- or S-type star. Observational and theoretical difficulties with each of these scenarios are discussed.

References

- Flannery, B. and Herbig, G. H.: 1973, *Astrophys. J.* **183**, 491.
Herbig, G. H. and Boyarchuk, A. A.: 1968, *Astrophys. J.* **153**, 397.

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