

# The Variability of Young Solar-Type Stars

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The characterization of the changing output of solar-type stars (total, ultraviolet, X-ray, visible)—from the time of planet-formation to the current epoch—is needed to understand: (i) the formation and early evolution of planetary atmospheres ( $t < 500$  Myr); and (ii) climatic variations among more mature planets ( $t > 500$  Myr). Understanding the nature of the joint variability of irradiance and magnetic activity on sun-like stars spanning a range of ages will provide crucial insight on how frequently earth-like atmospheres are likely to form and survive, and how frequently exo-earths encounter benign climatic variations.

In order to investigate the nature of the variability of the ambient radiative and particle environments of young solar-systems, we have implemented a photometric program to monitor the brightness variations in the solar-type stars in the young Pleiades star cluster with an age of approximately 100 Myr. We describe the automated telescope and instrumentation combined with the reduction and analysis methods we utilize to examine the short-term variability in these young counterparts of the Sun that likely arises from magnetic field-related activity. Preliminary results are presented along with a brief discussion of future plans to extend this program to star clusters that span a range of age from  $\sim 10$  Myr to solar-age at  $\sim 5$  Gyr.

This program is supported in part by the NAI under Cooperative Agreement No. CAN-02-OSS-02 issued through the Office of Space Science. The NSO and the NOAO are operated by AURA for the National Science Foundation.