

## **IMPROVED AGES FROM ECLIPSING BINARIES IN OPEN STAR CLUSTERS NGC 6791 AND NGC 6819**

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Age is difficult to measure to extreme precision for stars other than the Sun. In the field being observed by Kepler, the open star clusters NGC 6791 and NGC 6819 offer the opportunity to test a variety of methods of age determination, including several capable of high precision. We propose to use Kepler to push the limits of age determination using weakly-interacting binary stars that contain evolved stars. Because mass and radius can be measured extremely precisely (to better than 1%) for such binaries and require minimal theoretical interpretation, we can make use of the rapid changes in size that begin when a star leaves the main sequence to constrain ages tightly. With a minimal investment of short-cadence observations, we demonstrate that we can push the age precision in both clusters to better than 7% via this method. These two open clusters are becoming extremely strong tests of stellar evolution theory, and will have an important influence well beyond stellar astrophysics.