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The variability of red giant stars

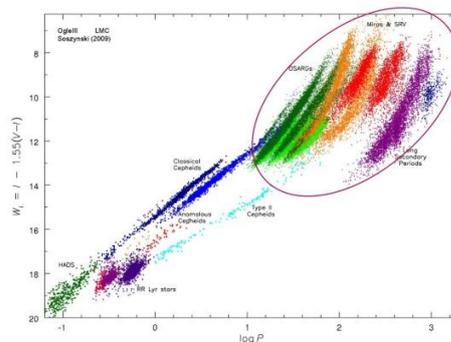


Prof. Peter Wood (Australian National University)

Peter Wood is a Professor at the Research School of Astronomy and Astrophysics in the Australian National University (ANU). He obtained his PhD at the ANU in 1974, followed by postdocs at the University of Sussex and the University of Illinois, and then he came back to ANU. Much of his research has concentrated on theoretical studies of the evolution and pulsation of red giant stars, especially asymptotic giant branch stars. Being from the southern hemisphere, he has also made extensive observations of these stars in the Magellanic Clouds in order to test the theoretical results.

Abstract

The luminous red giant stars can vary with visual amplitudes that range from barely detectable up to more than 6 magnitudes, as in the case of Mira variables. Long-term photometric monitoring over the last two decades by microlensing experiments such as MACHO and OGLE has provided data which has revolutionized our understanding of red giant variability. The results of these surveys show that the luminous red giants fall on approximately ten period-luminosity (PL) sequences of different origin. Eight of these sequences are almost certainly of pulsation origin. I will discuss the nature of these sequences and the latest attempts to model them, and compare their pulsation to that of the much less luminous red giants studied by Kepler. One of the non-pulsating PL sequences consists of close binary systems containing a red giant. Modelling this population can give a reliable estimate of the formation rate of planetary nebulae, binary and single. The final PL sequence consist of red giants with long secondary periods (LSPs). These LSPs occur in at least 1/3 of all luminous red giants. I will present what we know about LSPs but their origin remains one of the most prominent mysteries in stellar astrophysics.



All are welcome! Tea, coffee, biscuits will be served at 2:15 P.M.

You are welcome to nominate speakers to Weimin Yuan (wmy@nao.cas.cn), Mei Zhang (zhangmei@bao.ac.cn), Licai Deng (licai@bao.ac.cn), Xuelei Chen (xuelei@cosmology.bao.ac.cn), Shude Mao (smao@nao.cas.cn)