国台学术报告 NAOC COLLOQUIUM

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Understanding the Correlations
# in Asteroseismology

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Dr. Jing Luan is studying for a doctor's degree at Theoretical AstroPhysics Including Relativity (TAPIR), Califorina Institute of Technology. She got her B.Sc. in Physics from Peking University in 2008. She works with Peter Goldreich at Caltech on asteroseismology since 2012, and worked with Sterl Phinney on orbital evolution during common envelope from 2009 to 2012, with Yanbei Chen on infinite impulse response filter (IIR) from 2008 to 2009.

Abstract

Asteroseismology studies the oscillation of stars. Our sun oscillates in a period of about 5min with surface velocity only about 50cm/s. Solar-like oscillations are difficult to be observed in other stars because of their small oscillation amplitudes. Kepler, the highly sensitive optical space telescope, has recently started a new age for asteroseismology. About 1700 stars have been found to show solar-like oscillations, including main-sequence stars, subgiants and red giants. The flux from the star changes due to stellar oscillation. Each oscillation mode corresponds to a peak in the power spectrum. There are two key parameters in the power spectrum, one is v_{max} which is the frequency of maximum power, while the other is γ which is the width of half height of the peak at v_{max}. Observers found that both v_{max} and γ correlate with the stellar properties, like the luminosity, the mass, the effective temperature, etc. We establish analytical models to explain these correlations and our order-of-magnitude results fit the observational results well.
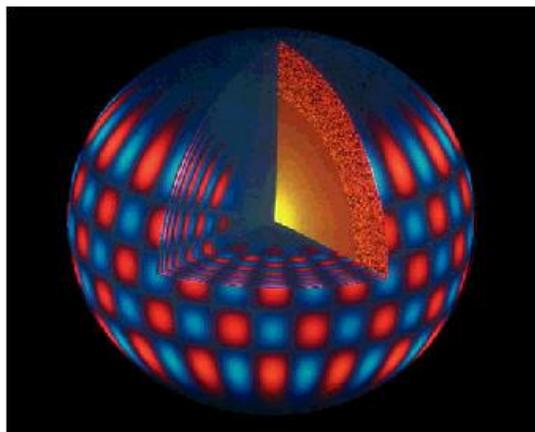
All are welcome! Tea, coffee, biscuits will be served at 2:15 P.M.

You are welcome to nominate speakers to Weimin Yuan (wmy@nao.cas.cn, Jan-Mar), Mei Zhang (zhangmei@bao.ac.cn, Apr-Jun), Licai Deng (licai@bao.ac.cn, Jul -Sep), Xuelei Chen (xuelei@cosmology.bao.ac.cn, Oct -Dec).