

# 国台学术报告 NAOC COLLOQUIUM

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**TIME: Monday 2:00 PM, Oct 29, 2012**    **LOCATION: A601 NAOC**

## Special/General Relativity Effects in Galaxies and Clusters

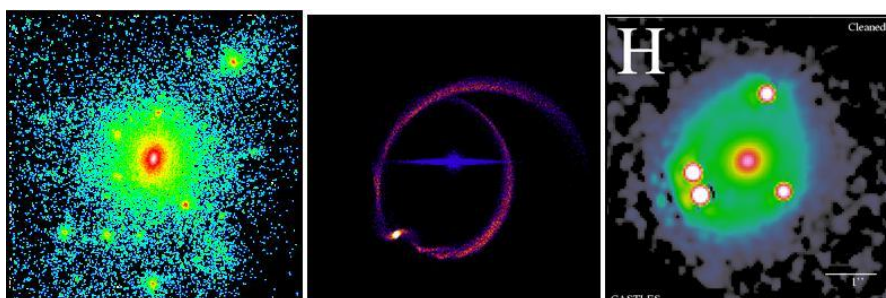


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Dr. Hongsheng Zhao is an astronomer at Univ. of St. Andrews, School of Physics and Astronomy. Before that he was at Institute of Astronomy, Cambridge. His research includes dynamics and lensing of dark matter halo, theories of dark energy and modified gravity.

### Abstract

There is growing interest in the subtle Gravitational Redshifts in clusters of galaxies due to General Relativity. However, current



models all neglect a Transverse Doppler redshift of similar magnitude, and some models are not self-consistent. An equilibrium model would fix the Gravitational and Transverse Doppler velocity shifts to be about  $6\sigma^2/c$  and  $3\sigma^2/2c$  in order to fit the observed velocity dispersion  $\sigma$  self-consistently. This result is from the Virial Theorem for a spherical isotropic cluster, and is insensitive to the theory of gravity. In any case, a gravitational redshift signal cannot directly distinguish between the Einsteinian and  $f(R)$  gravity theories, because the mass of the cluster dark halo must be treated as an unknown fitting parameter, whose value must vary according to the theory adopted, otherwise the system would be in equilibrium in one gravity theory and out of equilibrium in another.

*All are welcome! Tea, coffee, biscuits will be served at 1:45 P.M.*

You are welcome to nominate speakers to Shude Mao ([shude.mao@gmail.com](mailto:shude.mao@gmail.com)), Licai Deng ([licai@bao.ac.cn](mailto:licai@bao.ac.cn)), Xuelei Chen ([xuelei@cosmology.bao.ac.cn](mailto:xuelei@cosmology.bao.ac.cn)).