



## ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

# PHYSICS COLLOQUIUM

**Thursday, 20 February 2014**

**17:00 -18:00**

**3<sup>rd</sup> Floor Seminar Room**

**“The physical properties of luminous infrared galaxies:  
unveiling the dust”**

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### **Abstract**

A major result of the IRAS survey, the first unbiased survey of the whole sky at mid and far-infrared wavelengths, was the discovery of a large population of luminous infrared galaxies (LIRGs), which emit a significant fraction of their bolometric luminosity in the far-infrared,  $\log[L(8-1000\mu\text{m})] > 11 L_8$ . LIRGs cover the full range of morphologies from single isolated disk galaxies, to interacting systems and advanced mergers, exhibiting enhanced star-formation rates and a higher fraction of Active Galactic Nuclei (AGN) compared to less luminous galaxies. Although rare in the local universe LIRGs are 1000 times more abundant at  $z \sim 1-2$ , dominating the total energy density production. Furthermore, recent studies have revealed that even the most extreme of these distant systems, the Ultra LIRGs with  $\log[L(8-1000\mu\text{m})] > 12 L_8$  (the so called ULIRGs), do not resemble their local ULIRG analogues, but instead the lower luminosity local LIRGs. I will present a summary of our current understanding on the physical properties of LIRGs based on the study of the Great Observatories All-Sky LIRG Survey (GOALS, Armus et al. 2009), a complete infrared selected flux-limited sample of such systems. I will rely on recent mid- and far-infrared spectroscopy of the sample using the Spitzer and Herschel Space Telescopes, which provides a nearly extinction free view of their nuclear regions. Using a variety of diagnostics I will discuss the excitation conditions of the atomic and molecular gas, the spatial extent of the circumnuclear starbursts, as well as the contribution of optically obscured AGN to their total luminosity.