



**ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ**

**PHYSICS COLLOQUIUM**

**Thursday, 25 April 2013**

**17:00 -18:00**

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

**“Circumstellar and Interstellar Fullerenes”**

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**Abstract**

Fullerenes are large molecules made of carbon arranged in a spherical or ellipsoidal configuration. These molecules were discovered in laboratory experiments aimed at understanding the formation of long carbon chains in the circumstellar environment of carbon stars. Recently, we reported the first detection of fullerenes (C<sub>60</sub>, C<sub>70</sub>) in space, specifically in Tc1, a young planetary nebulae (PNe). Once injected into the ISM these stable species survive, and are thus probably widespread in the Galaxy where they could contribute to the interstellar extinction, heating processes, and complex chemical reactions. Following our discovery, fullerenes have now been detected in a wide range of sources (post-AGBs, PNe, reflection nebula, HII regions, H-poor stars, and YSOs), showing that when conditions are favorable, fullerenes are formed in large quantities. These findings suggest that the circumstellar envelope of evolve stars could be the birthplace of fullerenes. However, their excitation mechanisms - which sets diagnostic value - and formation routes are not yet understood. In this talk I will review our current knowledge on fullerene detection, and I will discuss the pros and cons of the various proposed excitation and formation mechanisms.