

## **Seminarium Astrofizyczne**

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### **VIPERS red nuggets – hunting for unaltered witnesses of the early Universe**

To understand our Universe, we trace galaxies at different evolution stages. We are tracing the number of stars formed at different galaxy types and other main physical properties as a function of time, trying to explain the theory behind galaxies' evolution. Nevertheless, some aspects remain a mystery. For example the first detection of progenitors of the most massive galaxies in the local Universe, so-called 'red nuggets'. Those galaxies are not only very massive but also extremely compact. At the same time they are passive, showing spheroidal shapes. As red nuggets were detected at high-redshift, at the time challenged the leading cosmological models. Direct observations and studies of red nuggets are limited due to angular and spectral resolution and can be only cursory. Yet, since the galaxies' mergers are stochastic events, it is possible that some of them remain relatively unaltered for billions of years and constitute so-called 'relics' in the local Universe. Both red nuggets and relics, provide a unique opportunity to study almost isolated stellar populations.

Despite numerous studies dedicated to red nuggets and relics, the link between the population of compact, massive, passive galaxies in the early Universe and their remnants in the local Universe, is still poorly understood. VIMOS public Extragalactic Redshift Survey (VIPERS) is a spectroscopic survey investigating the spatial distribution of galaxies on redshift  $0.4 < z < 1.2$ . The catalogue of spectroscopic redshifts, combined with photometric data from ultraviolet to infrared, is perfect for finding and studying intermediate redshift red nuggets.

I will present the result of searching for the red nuggets in the VIPERS survey, resulting in identifying 77 new objects under the most strict criteria. It is the most extensive catalogue of this kind of galaxies above redshift  $z > 0.5$ . I will discuss the influence of compactness criteria on the sample size. Finally, I will compare VIPERS red nuggets number densities to other studies and show the impact of this research on this field of galaxies evolution.

Serdecznie zapraszam,

Agnieszka Majczyna