Α ΡΙΣΤΟΤΕΛΕΙΟ
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Θ ΕΣΣΑΛΟΝΙΚΗΣ

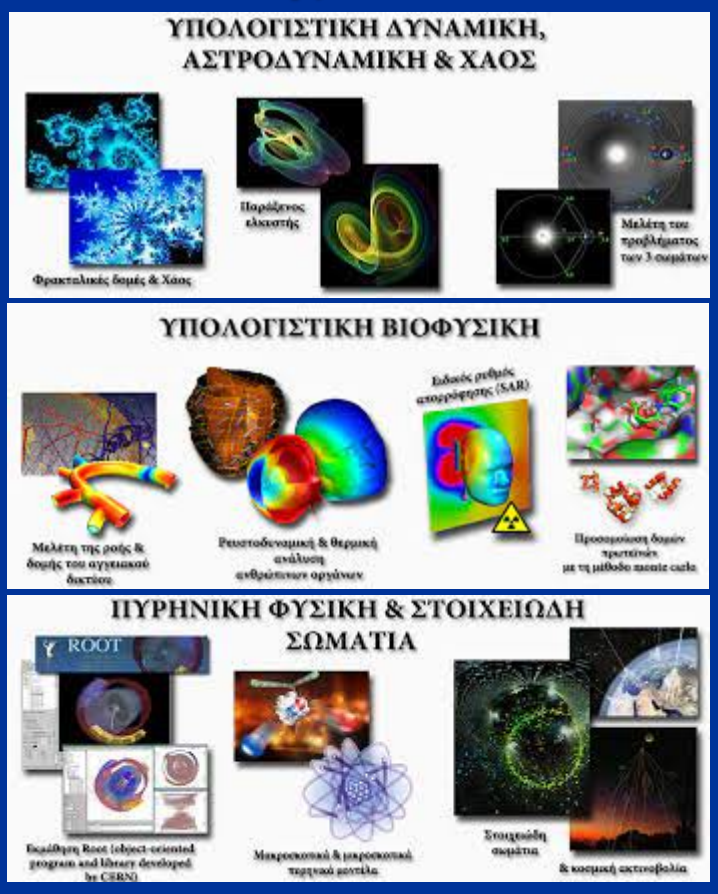
ΣΕΜΙΝΑΡΙΟ
ΠΜΣ ΥΠΟΛΟΓΙΣΤΙΚΗΣ ΦΥΣΙΚΗΣ
ΤΜΗΜΑ ΦΥΣΙΚΗΣ

Τρίτη 31 Μαΐου 2022

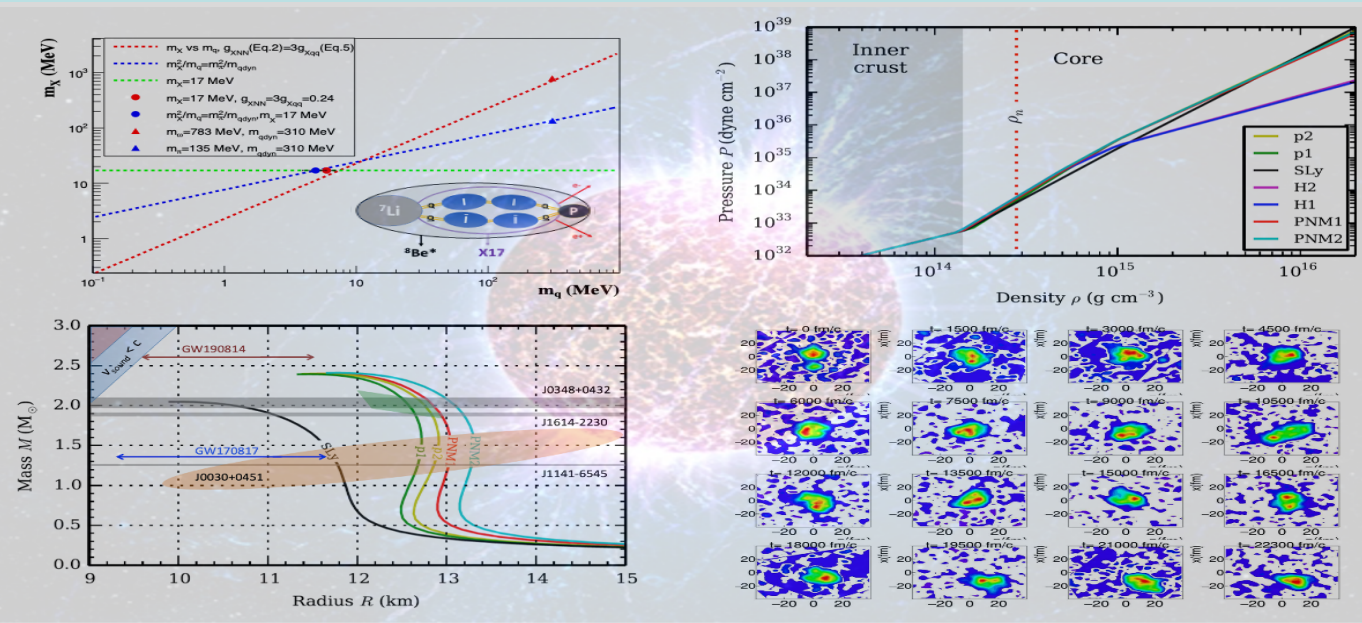
ώρα 12:00

Zoom link: authgr.zoom.us/j/93408351002

Σεμινάρια ΠΜΣ Υπολογιστικής Φυσικής 2021-2022



New proposed nuclear matter that could exist in a neutron star environment

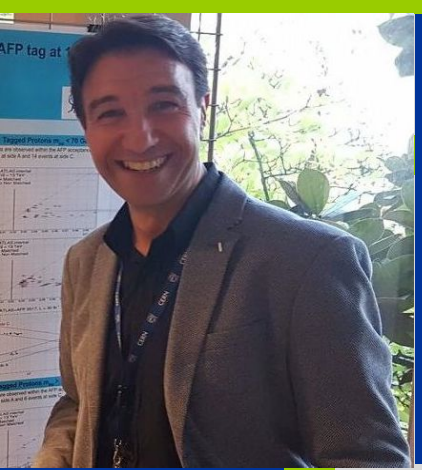


Dr. Vlasios Petousis

Institute of Experimental and Applied Physics- Czech Technical University in Prague (IEAP-CTU)

Neutron stars are nuclear physics laboratories, providing a unique opportunity to apply and search for new physics. In that spirit during this talk, we will explore two possible scenarios of a new proposed matter that could exist in a Neutron Star environment: In the first scenario, the reported 17 MeV boson, which has been proposed as an explanation to the ^{8}Be and ^{4}He anomaly, is investigated in the context of its possible influence the neutron star structure. The work done implementing a m_X=17 MeV to the nuclear equation of state using different incompressibility values and solving the Tolman-Oppenheimer-Volkoff equations. In the second scenario, the synthesis of hyper-heavy elements is investigated under conditions simulating the neutron star environment. A new type of the fusion barrier due to a "neutron wind" is observed when the effect of the neutron star environment is introduced implicitly. When introducing a background of surrounding nuclei, the nuclear fusion becomes possible down to temperatures of 10^8 K and synthesis of extremely heavy and n-rich nuclei appears feasible. A possible existence of hyper-heavy nuclei in a neutron star environment could provide a mechanism of extra coherent neutrino scattering or an additional mechanism, resulting in X-ray burst or a gravitational wave signal.

Το προφίλ του ομιλητή



Vlasios Petousis is a Greek senior physicist at the Institute of Experimental and Applied Physics- Czech Technical University in Prague (IEAP-CTU). He studied physics at the University of Ioannina in Greece and earned his PhD in applied physics from the University of Thessaly and the University of Würzburg. Has worked as Lecturer at the Technological Education Institute of Lamia in Greece and later on, as a postdoc researcher at the Rudjer Boskovic Institute of Nuclear Physics in Zagreb-Croatia, working with silicon pixel detectors for the CMS collaboration at LHC. Has continued as a postdoc fellow at the Nuclear and Heavy Ion Physics Laboratory at the University of Cyprus, on behalf of HADES collaboration (at GSI in Darmstadt-Germany) and after that as an external scientist at the APEX experiment in Jefferson Lab. Since 2018 become a member of the IEAP-CTU working for the ATLAS – Forward Proton Detectors (AFP) project, with contribution to di-muon analysis with proton tagging and detectors alignment.

He is an amateur astronomer and science communicator, has interest in the history of physics and has translated in Greek language the book "For the Love of Physics from the End of the Rainbow to the Edge of Time". His current research interests include phenomenological and theoretical interpretation of the X17 ATOMKI anomaly, the structure of the Neutron Stars and its cooling processes.