ΑΡΙΣΤΟΤΕΛΕΙΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΟΝΙΚΗΣ

# ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑ ΦΥΣΙΚΗΣ

## Δευτέρα 6 Ιουνίου 2016

## ώρα $12^{15}$

## Αίθουσα Γενικών Συνελεύσεων

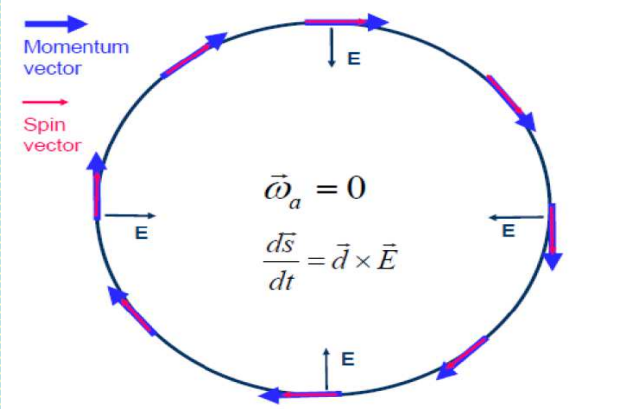
## 4ος όροφος, αίθουσα 26

Κύκλος σεμιναρίων

... ένα ταξίδι σύγχρονης στον κόσμο της Φυσικής

στο Τμήμα Φυσικής

# The storage ring proton electric dipole moment (EDM) method promising the most sensitive hadronic EDM experiment





## Director Yannis K. Semertzidis

### Center for Axion and Precision Physics Research



The search for the EDM of the proton in an all-electric storage ring promises to improve the current hadronic EDM sensitivity by more than three orders of magnitude. Usually the study of EDM involves the application of strong electric fields and neutral systems were thought to be easier to work with. We have developed a new method in which charged particles in all-electric storage rings can be used instead, using techniques similar to the muon g-2 experiment. The high sensitivity study of the proton EDM is possible due to the high intensity polarized proton beams readily available today, making possible to reach beyond 1000 TeV in New Physics mass scale. This experiment can offer the best motivation for the next large hadron collider under consideration in China.


*Το προφίλ του ομιλητή*

Director Yannis K. Semertzidis, a fellow of the American Physics Society and a tenured, senior physicist at Brookhaven National Laboratory in New York, was appointed as director of the IBS research center in October 2013 in recognition of his experiments in precision particle physics and his experimental plan to search for the dark-matter axion. The IBS center was set up at KAIST with a new IBS building location already chosen to house the experiment and a number of other IBS centers at KAIST. Yannis Semertzidis graduated from Aristotle University of Thessaloniki (1984), received his PhD from University of Rochester and worked as a research scientist in Rochester, Brookhaven and CERN. Until recently, he focused mainly on two experimental projects: one exploring the dark-matter axion, and another doing precision physics in storage rings including the muon g-2 experiment and searching for the electric dipole moment (EDM) of protons with unprecedented sensitivity. According to the theory of quantum mechanics (QM) the existence of the EDM of protons would violate the discrete symmetries of P-parity and T-time reversal symmetries. Those symmetries are linked to the matter-anti-matter asymmetry problem and an observed proton EDM will help solve that mystery.