ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ
ΤΟΜΕΑΣ ΦΥΣΙΚΗΣ ΣΤΕΡΕΑΣ ΚΑΤΑΣΤΑΣΗΣ

ΠΑΝΕΠΙΣΤΗΜΙΟΥΠΟΛΗ, 157 84 ΑΘΗΝΑ

ΕΘΝΙΚΟ ΜΕΤΣΟΒΙΟ ΠΟΛΥΤΕΧΝΕΙΟ
ΤΟΜΕΑΣ ΦΥΣΙΚΗΣ, ΣΧΟΛΗ ΕΦΑΡΜΟΣΜΕΝΩΝ ΜΑΘΗΜΑΤΙΚΩΝ ΚΑΙ ΦΥΣΙΚΩΝ ΕΠΙΣΤΗΜΩΝ
ΠΟΛΥΤΕΧΝΕΙΟΥΠΟΛΗ, 157 80 ΑΘΗΝΑ

ΣΕΜΙΝΑΡΙΟ
ΦΥΣΙΚΗΣ ΣΥΜΠΥΚΝΩΜΕΝΗΣ ΥΛΗΣ

Παρασκευή 10-01-2014 14:30 μ.μ.

Αίθουσα 027, Ισόγειο Κτηρίου Φυσικής, Πολυτεχνειούπολη Ζωγράφου

Tunable Photonic Oscillators

Dr. Vassilios Kovanis

Bradley Department of Electrical and Computer Engineering, Virginia Polytechnic Institute and State University, USA

Limit cycle oscillators are used to model a broad range of periodic nonlinear phenomena. Using the optically injected semiconductor oscillator as key paradigm architecture we will demonstrate that at specific islands in the optical detuning and injection level map, the period one limit frequency is simultaneously insensitive to multiple perturbation sources. In our system these include the temperature fluctuations experienced by the master and slave lasers as well as fluctuations in the bias current applied to the slave laser. Tuning of the oscillation frequency then depends only on the injected optical field amplitude. Experimental measurements are in good quantitative agreement with numerical modeling and analysis based on reduced generalized Adler phase equations. These special operating regions should prove valuable for developing ultrastable nonlinear oscillators, such as sharp linewidth, frequency tunable photonic microwave oscillators. Finally the concept of an isochron originally developed in mathematical biology will be reviewed and placed on context for efficient design of stable frequency sources via systems of coupled limit cycles oscillators. Time permitting a few new theoretical results on injecting monothematic signals into quantum cascade laser gain media will be outlined.

Υπεύθυνοι Οργάνωσης Σεμιναρίων:

Σ. Γλένης	Πανεπιστήμιο Αθηνών,	τηλ. 2107276811	sglenis@phys.uoa.gr
Λ. Τσέτσερης	Ε. Μ. Π.	τηλ. 2107723046	leont@mail.ntua.gr