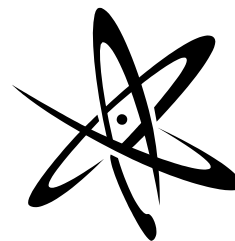


PHYSICS COLLOQUIUM

Seminars



Andre Marziali

University of British Columbia

“2-D Non-linear Electrophoresis for Bio-Molecule Concentration Applications to Forensics and Metagenomics”

Monday, April 7, 2008

4:00 PM, Ronald Geballe Auditorium, Rm. A-102

April 7-11, 2008

Abstract: We present a novel technique capable of electrophoretically isolating and pre-concentrating nucleic acids to at least 10,000 fold DNA enrichment from dilute solutions, allowing a similar increase in the sensitivity of subsequent detection steps. Due to the non-mechanical nature of the process, it is also possible to isolate and extract high molecular weight DNA up to 1Mb in length without shearing, making this method very useful for metagenomics – the study of unculturable organisms by DNA analysis. Taking advantage of DNA’s non-linear response to electric fields, we apply a novel form of 2-D nonlinear electrophoresis such that rotating electric fields cause specific DNA fragments to concentrate in a tight central focus. We achieve powerful separation and high concentration of DNA from contaminants without the clogging, losses, cost, and mechanical shearing associated with filtration. This technique represents a general method for simple, inexpensive, and selective concentration of nucleic acids that is particularly well suited for low abundance or high molecular weight DNA purification. In recent results, we show detection of DNA at zeptomolar concentrations, by pre-concentration followed by PCR. This talk will present an overview of this technology, and applications to forensics and metagenomics.

Tuesday, April 8

Condensed Matter Seminar

4:00 PM, Rm. C-421, PAT

Marcel den Nijs, UW Physics

“Power law in the brain”

Thursday, April 10

Astronomy Colloquium

4:00 PM, Rm. A-102, PAA

John Johnson, University of Hawaii, Honolulu

“Planet Hunting in New Stellar Domains”