Physics Colloquium Abstracts: Current Colloquia

Two-minute colloquia

Location: Herzberg 4351

Date: 2010-09-28
Time: 15:30-16:30
Abstract:
Every year we hold a special colloquium to introduce ourselves to any new people in the department. Everyone gets two minutes to describe who they are and what they do. RAs/postdocs and grad students are especially invited! Each faculty member and postdoc should be prepared to give a two-minute presentation. Please send your updated slide to Gabriel Sawakuchi.

CanAMS: the Accelerator Mass Spectrometry Facility at the University of Ottawa

A new resource for isotope measurements

W. E. (Liam) Kieser, Department of Physics, University of Ottawa

Ian D. Clark, Department of Earth Sciences, University of Ottawa

Location: Herzberg 4351

Date: 2010-10-05
Time: 15:30-16:30
Abstract:
The funding of the CanAMS facility at uOttawa has revived Accelerator Mass Spectrometry (AMS) technology in Canada and has brought a powerful new resource to the Ottawa area. Over the past 30 years, AMS has provided an expanding array of rare isotope analyses, at levels which far exceed the detection limits of conventional instruments. This sensitivity, and the small sample sizes which can be processed, have revolutionized our abilities to establish chronologies over a variety of time scales and to trace the paths of particular elements through complex natural systems. The Physics part of this talk will begin by outlining the fundamental principles and techniques which enable AMS to measure isotope abundance ratios as low as 1 part in 1016. It will then examine in more detail the recent advances in the separation of isobars, using both molecular ions generated in the sputter source and low energy ion-gas reaction technology. It will conclude with a description of the new AMS system to be installed on the uOttawa downtown campus The Earth Sciences part will discuss the range of new tracers that were inaccessible before AMS. 14C can now be applied to small compound specific samples. 129I and 36Cl are now part of the geochemist's arsenal to resolve issues ranging from the dating of groundwaters and tracing crustal fluids to reconstructing Pleistocene landscapes or tracing emissions from the nuclear fuel cycle. The new facility at uOttawa will continue to expand this array of new research opportunities.

Measurement of the W to lnu and Z/gamma* to ll production cross sections with the ATLAS detector

Manuella G. Vincter

Canada Research Chair and Professor

Department of Physics

Carleton University

Location: Herzberg 4351

Date: Tuesday Oct 26, 2010

Time: 3:30 pm to 4:15 pm

Date: 2010-10-26
Time: 15:30-16:30
Abstract:
I will outline the first measurements of the W to lnu and Z/gamma* to ll production cross sections in proton-proton collisions at root(s) = 7 TeV using data recorded by the ATLAS experiment at the LHC. These results are based on a data set corresponding to an integrated luminosity of approximately 320 nb-1.

Silicon Photonics: Devices, Applications and Challenges

Winnie Ye

Canada Research Chair and Assistant Professor

Micro/NanoPhotonics Group

Department of Electronics

Carleton University

Location: Herzberg 4351

Date: Tuesday Nov 02, 2010

Time: 3:30 pm to 4:30 pm

Date: 2010-11-02
Time: 15:30-16:30
Abstract:
Silicon based photonics has been under great scrutiny in recent years due to their potential for making highly compact monolithic integration of multifunctional electronic and photonic devices on the same substrate. The most popular platform is the high index contrast silicon-on-insulator (SOI) system. The high refractive index contrast between the silica cladding and the silicon waveguide core facilitates the confinement and guiding of light in structures within submicron or nanometer dimensions. In addition, the mature silicon microfabrication technology establishes a firm foundation for making low-cost and compact integrated photonic devices. A wide range of active and passive optical devices has been realized on the SOI platform. The applications of these devices can be found in high-speed communications, health industry, chemical and biological analysis, environmental monitoring, optical interconnects, and renewable energy. This talk will describe the state of the art silicon based components and systems that are reported in the literature. The challenges and future opportunities and directions will also be discussed.

New Approaches to MRI Evaluation of Microvasculature

M. Noseworthy

Associate Professor

Department of Electrical and Computer Engineering

Departments of Medical Physics and Radiology

McMaster University

Location: Herzberg 5115

Date: Wednesday Nov 17, 2010

Time: 10:00 am to 11:00 am

Date: 2010-11-17
Time: 10:00-11:00
Abstract:
Aberrant tissue microvasculature is implicated in numerous diseases including cancer and diabetes. Dynamic contrast enhanced MRI (dceMRI) can non-invasively be used to assess microcirculation. However, mathematical modeling of dceMRI data necessitates assumptions concerning the whereabouts of contrast agent location with respect to the cellular environment and the distribution kinetics between various tissue pools (i.e. intra- and extrvascular spaces). Previous work in my lab has involved correlating dceMRI with quantitative analytical electron microscopy (EM) methods. Using energy dispersive X-Ray spectrometry (EDXS) microanalysis to assess the subcellular content and location of gadolinium (Gd) chelates in a vx2 tumour model, it was found that contrast equilibration between blood and extravascular space does not match current assumptions. In addition Gd was found within endothelial cells lining both tumour microvasculature and skeletal muscle, which may be related to the contrast-associated toxic reaction nephrogenic systemic fibrosis (NSF). These findings indicate pharmacokinetic models for dceMRI analysis are likely over-simplified. Therefore in my lab we have been working on a number of different avenues to microvascular evaluation that gravitate away from these standard approaches. For example, we are using multivariate techniques to analyze dceMRI data. In addition, my lab is involved considerably in evaluation of temporal variation in blood-oxygen level dependent (BOLD) MR imaging with Fourier, fractal, and PCA techniques. In this presentation I will briefly discuss dceMRI modelling and our recent success in using some of these other approaches to understanding tissue microvasculature.

CRIPT: Cosmic Ray Inspection and Passive Tomography

John Armitage

Professor

Department of Physics

Carleton University

Location: Herzberg 4351

Date: Tuesday Nov 23, 2010

Time: 3:30 pm to 4:30 pm

Date: 2010-11-23
Time: 15:30-16:30
Abstract:
The smuggling of fissile material into or out of Canada is a concern. The Canadian Border Services Agency has systems in place to detect low-level gamma radiation but the efficiency of detecting well shielded nuclear materials is very low. While the probability of smuggling a fissile device into Canada is thankfully very low, the consequences

could be devastating, so monitoring the transport of these materials - in cargo containers for example, warrants further investigation. A Canadian team is working on a proof of principle project, to see if the naturally occurring cosmic ray muon flux can be used to detect the presence of high atomic number (high Z) materials. This method applies high energy physics detector techniques to track the muons as they interact with the material. The talk will review current work in the area of muon tomography, will discuss the techniques that Carleton proposes to use - highlighting the advantages of this method, and will describe the progress to date. Other applications for the system will be discussed including the verification of stores of nuclear materials, and muon radiography used to study volcanic activity.

Symmetry breaking with and without a Higgs

Barath Coleppa

Research Associate

Department of Physics

Carleton University

Location: Herzberg 4351

Date: Tuesday Nov 30, 2010

Time: 3:30 pm to 4:30 pm

Date: 2010-11-30
Time: 15:30-16:30
Abstract:
I'll be discussing the issue of electroweak symmetry breaking in the Standard Model and beyond. Specifically, we will look at the role played by the Higgs field. To keep the discussion simple, we will only concern ourselves with the bosonic sector of the theory. We will then look at "Higgsless" scenarios, drawing attention to the fact that a Higgs mechanism doesn't necessarily require a Higgs boson to be present.

OCIP graduate student symposium, fall 2010

Location: MCD 121

Date: Thursday Dec 09, 2010

Time: 1:30 pm to 4:50 pm

Date: 2010-12-09
Time: 13:30-16:30
Abstract:

1:30 pm: Jamie Brar (MSc, UOttawa), "Photoluminescence spectroscopy of colloidal quantum dots"

1:50 pm: Miro Vujicic (MSc, CarletonU), "Pseudorapidity intercalibration of the ATLAS calorimeters"

2:10 pm: Joseph Hickey (MSc, UOttawa), "Beyond classical nucleation: What can a cellular automata model tell us about crystal nucleation?"

2:30 pm: Shane Scott (MSc, UOttawa), "Rheological studies of self-assembling amphiphilic protein hydrogels"

2:50 pm: Malcolm Latorre (MSc, UOttawa), "The paxon: An electro-physical model of a myelinated axon"

3:10 pm: Break with refreshments

3:30 pm Patrick Assouad (MSc, CarletonU), "Fiber evanescent wave mid-infrared spectroscopy for in-vivo cervical cancer diagnostics"

3:50 pm: Rimma Bektursunova (PhD, UOttawa), "A model of periodic precipitation of pyrite in marine sediments"

4:10 pm: Owen Hickey (PhD, UOttawa), "Using polymer coatings to modulate electro-osmotic flow"

4:30 pm: Martin Bertrand (PhD, UOttawa), "Vesicle extrusion through nanopores"

OCIP Annual Christmas Symposium 2010

Department of Physics

Carleton University and University of Ottawa

Location: Senate Chamber, Robertson Hall, 6th floor

Date: Tuesday Dec 14, 2010

Time: 9:15 am to 12:45 pm

Date: 2010-12-14
Time: 09:15-12:45
Abstract:

9:15 am: Robert Boyd, "A half-century of nonlinear optics"

9:45 am: Ian Cameron, "Can water diffusion measured with MRI be used to probe tissue properties in humans?"

10:15 am: Glenn Milne, "Sea-level fingerprinting"

10:45 am: Break with refreshments

11:15 am: Alain Bellerive, "Swan song from the Sudbury Neutrino Observatory"

11:45 am: Kuiying Chen, "Materials modelling towards industry and defence"

12:15 pm: Gabriel Sawakuchi, "Improving particle therapy dosimetry using Monte Carlo simulations and novel detectors"

12:45 pm: Lunch in the University Boardroom

A Milestone Toward LHC Discoveries: Measuring the Top Quark at ATLAS

Jean-Francois Arguin

Scientific Staff

Physics Division

Lawrence Berkeley Laboratory

Location: Herzberg 4351

Date: Monday Jan 17, 2011

Time: 4:00 pm to 5:00 pm

Date: 2011-01-17
Time: 16:00-17:00
Abstract:
We expect new discoveries to be made at the Large Hadron Collider in Geneva that hopefully will revolutionize the field of particle physics. We will only manage such discoveries with well calibrated detectors and a careful understanding of the backgrounds to new physics. The top quark will play a crucial role for both tasks. Indeed, because it has a huge mass and is copiously produced at the LHC, it can be used to calibrate the detectors in-situ and tend to mimic new physics processes. Understanding the production of top quarks is thus a high priority of the early physics program of the ATLAS experiment. In this talk I will present the first measurement of the top quark pair production with the ATLAS detector.

Electromagnetic signatures in ATLAS: First steps towards a longer goal

Thomas Koffas

Research Physicist Staff

CERN Laboratory

Location: Herzberg 4351

Date: Thursday Jan 20, 2011

Time: 2:00 pm to 3:00 pm

Date: 2011-01-20
Time: 14:00-15:00
Abstract:
The successful operation of the LHC over the past year has enabled the ATLAS detector to collect more than 40 pb-1 of collision data. A significant portion of these data has already been analyzed and results have been made public. Electromagnetic signatures are of particular importance since they constitute a large fraction of the final states of a number of physical processes already observed in the collected data. After an introduction on the particle physics aims, the LHC and the ATLAS detector, a brief overview of the reconstruction of electrons and photons in ATLAS will be given. It will then be followed by some selected recent results on physics processes involving electrons and photons in their final state where my personal involvement has been significant. Finally some future research plans will be presented.

Preclinical Lung Imaging using Micro-Computed Tomography

Nancy Ford

Assistant Professor

Department of Physics

Ryerson University

Location: Herzberg 4351

Date: Tuesday Jan 25, 2011

Time: 3:30 pm to 4:30 pm

Date: 2011-01-25
Time: 15:30-16:30
Abstract:
In medical research, many respiratory diseases are modelled using rodents. To monitor the disease severity and lung function in vivo, imaging techniques such as micro-computed tomography are used due to their non-invasive nature and similarity to clinical diagnostic techniques. However, these images suffer from artefacts due to the movement of the lungs during respiration. In this talk, I will present a method of retrospectively sorting the CT projections to produce images of a single respiratory phase, which eliminates motion artefacts. We have optimised the technique to reduce the x-ray dose to the rodent and the scan time, while ensuring the accuracy of the physiologically relevant image-based measurements. I will also present some micro-computed tomography investigations of different respiratory patterns, including free-breathing, mechanically ventilated and apneic states.

Photon physics at the LHC

Marco Delmastro

Research Physicist Staff

CERN Laboratory

Location: Herzberg 4351

Date: Thursday Feb 03, 2011

Time: 2:00 pm to 3:00 pm

Date: 2011-02-03
Time: 14:00-15:00
Abstract:
The study of photon production at the Large Hadron Collider is important for many reasons. Thanks to their well-measured energy, photons are used to calibrate the less-well-measured jet energy scale. The study of the direct photon production is a mean to measure the gluon distribution inside the proton, and to test the theoretical predictions of perturbative QCD. But even more importantly, QCD final states involving photons represent backgrounds to new physics processes explored at the LHC, the most famous (and experimentally challenging) being the production of a Standard Model Higgs boson decaying in a photon pair. In this presentation I will explore how photons are produced in proton-proton collision at the LHC, and how they are reconstructed and identified by the ATLAS detector. I will review the direct photon measurements performed by ATLAS with the first LHC data, and address how the excellent ATLAS capability of measuring photons will lead to the Standard Model Higgs discovery (or exclusion) in the next years.

Monte Carlo calculations and measurements of photon spectra from a miniature x-ray source used for brachytherapy applications

Steve Davis

Medical Physics Resident

McGill University Health Centre

Location: Herzberg 4351

Date: Tuesday March 01, 2011

Time: 3:30 pm to 4:30 pm

Date: 2011-03-01
Time: 15:30-16:30
Abstract:
A miniature x-ray source was developed by Xoft Inc. for high dose-rate brachytherapy treatments. The source is normally operated at 50 kV and uses a tungsten-coated anode to produce a lightly-filtered bremsstrahlung photon spectrum. The sources were initially used for early-stage breast cancer treatment using a balloon applicator. More recently, Xoft Inc. has developed vaginal and surface applicators.
The miniature x-ray sources have been characterized using the AAPM TG-43 formalism normally used for radioactive brachytherapy sources. Accurate knowledge of the emitted photon spectrum was necessary to calculate the corrections required to determine air-kerma strength. Theoretical predictions of the photon spectrum were calculated using three separate Monte Carlo codes: MCNP5, EGSnrc, and PENELOPE. Benchmark studies were performed to investigate differences in the implementation of the underlying radiological physics. Calculated photon spectra were compared to spectra measured with a high-purity germanium spectroscopy system.
The seminar will focus on the benchmark studies of the Monte Carlo codes and the comparisons of the calculated and measured photon spectra.

CAP LECTURE: Quantum Electrical Circuits

Adrian Lupascu

University of Waterloo

Location: Herzberg 4351

Date: Monday March 07, 2011

Time: 12:00 pm to 1:30 pm

Date: 2011-03-07
Time: 12:00-13:30
Abstract:
Quantum mechanics tells us that the state of a physical system is described by a wavefunction. The evolution of the wavefunction is either continuous, described by the time-dependent Schrodinger equation (when the system is isolated), or sudden (when the system is observed). Genuine quantum effects such as energy level quantization, interference, and state collapse due to measurement are usually observed with systems which are microscopic, such as atoms, photons, electrons. In recent years, the idea emerged that electrical circuits with superconductors display quantum effects despite their size, in the range 1 micrometer to 1 millimeter, placing them outside the microscopic domain. I will explain the fundamental concepts of quantum superconducting circuits and discuss the required conditions for quantum mechanical behavior. Such electrical circuits have potential applications in quantum computing and open a new area of research on light-matter interaction. I will discuss these prospects and the research carried out by our group.

Quantifying and compensating for uncertainties in 4D radiotherapy of lung cancer

Emily Heath

Assistant Professor

Department of Physics

Ryerson University

Location: Herzberg 4351

Date: Tuesday March 22, 2011

Time: 3:30 pm to 4:30 pm

Date: 2011-03-22
Time: 15:30-16:30
Abstract:
Respiratory motion is a potentially large source of targeting error in radiation therapy of lung tumours. The availability of temporal imaging, along with image registration and sophisticated treatment plan optimization software makes possible the design of treatments which compensate for an individual patient's respiratory motion. However, the multiple steps of this 4D radiotherapy process introduce the potential for additional uncertainties which may outweigh the benefit of such sophisticated approaches. This talk will discuss methods to evaluate the potential uncertainties in 4D radiation therapy of lung cancer employing both conventional photon beams and new scanned proton technology. Examples of methods to minimize these uncertainties will be discussed.

OCIP COLLOQUIUM: Last chance to be wrong about what the LHC will see

Cliff Burgess

Professor/Associate Member

Department of Physics, McMaster University/Perimeter Institute

Location: Herzberg 4351

Date: Tuesday March 29, 2011

Time: 3:30 pm to 4:30 pm

Date: 2011-03-29
Time: 15:30-16:30
Abstract:
The turn-on of the Large Hadron Collider (LHC) has been touted as likely to fundamentally change our picture of how nature works on the smallest of distances we can probe. This talk will review the case for why failure to discover something is believed not to be an option, and outline the three main categories of new physics that have been identified as the possible contenders for the new physics to be found. If time permits I will go out on a limb close with an explanation of what I personally believe the LHC will discover.

Optical Tomography of Mesoscopic Systems

Lucia Florescu

Associate Research Scientist

Department of Radiation Oncology, College of Physicians and Surgeons, Columbia University

Location: Herzberg 4351

Date: Tues April 05, 2011

Time: 3:45 pm to 4:45 pm

Date: 2011-04-05
Time: 15:45-16:45
Abstract:
Motivated by the numerous applications in the biomedical field, there is considerable interest in the development of optical techniques for three-dimensional imaging of biological systems. The optical approach to bioimaging has the advantage of being non-invasive, safe, inexpensive, and capable of measuring functional parameters and achieving high sensitivity to pathologic state of biological tissues. One application of optical imaging of particular interest regards mesoscopic systems such as superficial and engineered tissues, semitransparent organisms, animal embryos, or small-animal extremities. For such systems, the photon transport mean free path is on the same order as the system size. As a consequence, traditional imaging modalities that assume either ballistic or diffusive propagation of light are not suitable, and optical imaging techniques that bridge the gap between microscopic and macroscopic scales are necessary. In this talk, I will introduce a novel three-dimensional optical imaging technique for mesoscopic systems, named Single-Scattering Optical Tomography (SSOT), that enables the recovery of the structural characteristics of the system from angularly-resolved measurements of scattered light intensity. I will show that SSOT enables high-quality simultaneous reconstruction of optical scattering and absorption. I will also present the fluorescence-based SSOT and will discuss the advantages of SSOT over other imaging techniques.

In vivo Optical Molecular Imaging in Biomedicine

Sangeeta Murugkar

Senior Scientist

Department of Physics, University of Ottawa

Location: Herzberg 4351

Date: Wed April 13, 2011

Time: 3:30 pm to 4:30 pm

Date: 2011-04-13
Time: 15:30-16:30
Abstract:
Optical molecular imaging (OMI) couples optical imaging with different methods of enhancing chemical contrast at the molecular level. It promises to revolutionize the field of medicine due to its comparatively lower cost, high sensitivity and resolution combined with minimal toxicity. The development and applications of a label-free OMI technique based on coherent anti-Stokes Raman scattering (CARS) will be discussed in this talk. I will describe the design and implementation of the first fiber-optic miniaturized multimodal CARS microscope for the in vivo study of spinal cord disorders in small animals. I will share my vision of label-free OMI based on this technology for early disease detection in the clinic.

Molecular MRI with hyperpolarized xenon biosensors

Todd Stevens

Department of Chemistry, University of California, Berkeley

Location: Herzberg 4351

Date: Tuesday April 19, 2011

Time: 3:45 pm

Date: 2011-04-19
Time: 15:45-16:45
Abstract:
Molecular imaging aims to detect the presence and spatial distribution of specific biological markers in tissue, which can be of great diagnostic and prognostic value for a number of diseases. However, current clinical imaging methods often lack the sensitivity and/or spatial resolution required to generate such information from sparse molecular targets in the important early stages of disease progression. In this talk, a new and highly sensitive molecular MRI approach that utilizes the signal amplification mechanisms of both hyperpolarized xenon and chemical exchange saturation transfer (CEST) will be discussed. Specifically, the mechanics of HyperCEST contrast generation will be described with emphasis on the most modern types of contrast agent being employed for this imaging technique. Recent agent detection thresholds that are several orders of magnitude below the most advanced proton-based MRI agents will be presented, and plans for future HyperCEST development and application towards targeted in vivo molecular imaging will be summarized.

THE O(ptical)THER IMAGING

Optical Coherence Tomography and Microscopy

Dan Popescu

Research Associate

Institute of Biodiagnostics, National Research Council of Canada, Winnipeg

Location: Herzberg 5115

Date: Wed April 27, 2011

Time: 10:30 am to 11:30 am

Date: 2011-04-27
Time: 10:30-11:30
Abstract:
Two powerful optical imaging methods will be presented: optical coherence tomography (OCT) and multi-channel non-linear optical microscopy (MCM). Optical coherence tomography (OCT) is a non-contact optical method based on light interference. Commonly, OCT systems have spatial resolutions of ten micrometers or smaller and can image details located at depths of millimeters under the surfaces of biological samples. After a brief introduction into the basic principles of this method, results obtained by applying OCT imaging to dental and arterial studies are presented. Information is extracted from images by analyzing the dependence on depth of the OCT signal and by using box-counting to quantify the speckle texture. The other optical method, multi-channel non-linear optical microscopy (MCM), uses three independent channels capable of probing, with sub-micron resolution, various morphological compounds through the detection of the following tissue-laser beam interactions: two-photon excited fluorescence (TPEF), coherent anti-Stokes Raman scattering (CARS) and second harmonic generation (SHG). Each one of these channels produces biochemical arterial maps without the need for histological staining or sectioning.

Ideas for future directions of research based on OCT and interference microscopy will be presented in the last section of the talk.

Ottawa Carleton Institute for Physics L'Institut de physique d'Ottawa-Carleton Spring 2011 Graduate Student Seminars Afternoon 1

Location: Azrieli Theatre, room AT-102, Carleton University

Date: Friday April 29, 2011

Time: 2:00 pm to 4:10 pm

Date: 2011-04-29
Time: 14:00-16:10
Abstract:

2:00 Louise Guolla (M.Sc., U. Ottawa), "Deformation and remodelling of F-actin filaments in response to local nanonewton forces"

2:20 Andrew Erlandson (M.Sc., Carleton U.), "Drift velocity measurements for the CRIPT prototype drift chamber tracking system"

2:40 Xuan Liu (M.Sc., U. Ottawa), "Simultaneous temperature and strain measurement with bandwith and peak of the Brillouin spectrum in LEAF fibre"

3:00 Break with refreshments / Pause avec rafraichissements

3:30 Tyler Dumouchel (Ph.D., Carleton U.), "A three-dimensional partial volume correction strategy for cardiac mouse PET imaging"

3:50 Chris McDonald (Ph.D., U. Ottawa), "Electron dynamics and tunnelling time in strong fields"

Shedding Light on the Dark Universe

Alex Wright

Postdoctoral Fellow

Princeton University

Location: Herzberg 5115

Date: Tuesday May 03, 2011

Time: 3:30 pm

Date: 2011-05-03
Time: 15:30-16:30
Abstract:
We now believe, based on overwhelming astrophysical and cosmological evidence, that atomic matter makes up only a small fraction of the energy density of the universe. A much larger fraction is composed of so-called "dark matter," a new non-baryonic form of matter. In this talk, I will review the evidence for dark matter, describe its known properties,

and discuss the global program of dark matter detection experiments. I will then focus on DarkSide, a direct detection dark matter search program based on two-phase depleted argon time projection chambers. After describing some of the novel low-background techniques that we believe will allow DarkSide to achieve background levels that are both lower than, and better understood than, those in previous experiments I will review the significant technical progress that has been made towards bringing the first physics detector in the DarkSide program to fruition.

Ottawa Carleton Institute for Physics L'Institut de physique d'Ottawa-Carleton Spring 2011 Graduate Student Seminars Afternoon 2

Location: MacDonald Hall, room MCD 121, University of Ottawa

Date: Thursday May 05, 2011

Time: 2:00 pm to 4:10 pm

Date: 2011-05-05
Time: 14:00-16:50
Abstract:

2:00 Ross Cheriton (M.Sc., U. Ottawa), "Electrostatic control of quantum dots for entangled photon pair generation"

2:20 Katy Hally (M.Sc., Carleton U.), "Probing the compositeness of an extra-dimensional Higgs boson"

2:40 Daisy Williams (M.Sc., U. Ottawa), "3D parametric model of Brillouin amplification in an optical fibre"

3:00 Peter Wright (M. Sc., U. Ottawa), "Generation, characterization and application of 200nm, sub-35 fs laser pulses"

3:20 Break with refreshments / Pause avec rafraichissements

3:50 Elsayed Ali (Ph.D., Carleton U.), "Unfolding photon spectra of clinical linear accelerators"

4:10 Sarah Golin (Ph.D., U. Ottawa), "Studies of crystal structure measured with 1.8 micron light"

4:30 Amanda Cherpak (Ph.D., Carleton U.), "Evaluation of a novel 4D in vivo dosimetry system"

Bio-Medical Optics - Spectroscopic Optical Coherence Tomography

Costel Flueraru

Senior Research Officer

Institute for Microstructural Sciences, National Research Council

Location: Herzberg 4351

Date: Tuesday May 10, 2011

Time: 3:30 pm

Date: 2011-05-10
Time: 15:30-16:30
Abstract:

Bio-Medical Optics research covers all aspects of optical imaging and spectroscopy ranging from cellular length scales to large tissue volumes. Applications were demonstrated in medical diagnostics, therapeutics, virtual biopsy and functional imaging. A very recent addition to medical imaging modalities is Optical Coherence Tomography (OCT). Food and Drug Administration (FDA) has recently approved OCT for cardiovascular imaging. This approval has changed the medical optics research landscape and has put OCT on equal footing with X-ray imaging, ultrasound imaging, MRI and all other imaging modalities that are widely use in clinical applications. I am going to present our approach toward Spectroscopic Optical Coherence Tomography and several applications.

Characterization of Radiation in the Environment

Laurel Sinclair

Research Scientist

Natural Resources Canada

Location: Herzberg 4351

Date: Monday May 16, 2011

Time: 3:30 pm

Date: 2011-05-16
Time: 15:30-16:30
Abstract:
The Nuclear Emergency Response group at Natural Resources Canada conducts radiometric surveys both in support of security operations, and for consequence management. A research program into advanced methods and technologies for radiation detection in the environment has been established to support this operational work. The team has ongoing efforts in improving techniques for source localization by least squares fitting of gridded data and by shadow directional detection. Also this year, designs for a multi-channel Compton gamma imager were finalized, and assembly begun. I will present the latest results from these research activities, as well as a glimpse of the damaged Fukushima reactors which was provided by data collected off the west coast of Vancouver Island in March, 2011.

Ottawa Carleton Institute for Physics L'Institut de physique d'Ottawa-Carleton Spring 2011 Graduate Student Seminars Afternoon 3

Location: Azrieli Theatre, room AT-102, Carleton University

Date: Tuesday May 24, 2011

Time: 2:00 pm to 4:50 pm

Date: 2011-05-24
Time: 14:00-16:50
Abstract:

2:00 Joan Macadangdang (M.Sc., U. Ottawa), "Anisotropy of the cell nucleus is governed by the cytoskeleton"

2:20 Francois Leonard (M.Sc., Carleton U.), "Monte Carlo simulation of the Enriched Xenon Observatory"

2:40 Alexandre Bouchard (M.Sc., U. Ottawa), "Modifications a haute densite de l'interaction inter-halognes: Une etude des proprietes physiques du monobromure d'iode solide et dense"

3:00 Phillip Vinten (Ph.D., U. Ottawa), "Carbon nanotube growth by chemical vapour deposition"

3:20 Break with refreshments / Pause avec rafraichissements

3:50 Chang-Yu Hsieh (Ph.D., U. Ottawa), "Electron spin-based qubit in lateral quantum dots"

4:10 Joshua Turner (M.Sc., Carleton U.), "Diamond Mini-FCal upgrades for the ATLAS detector"

4:30 Andrew Shiner (Ph.D., U. Ottawa), "High harmonic generation with a short pulse long wavelength laser source"