Past Physics Seminar Calendar: 2002-2003

Dr. Kirsten Sachs (Carleton University) : Electroweak Physics at LEP2 - an overview

Monday, October 21, 2002
Location: HP 4351
Time: 3:30PM

Abstract: LEP was shut down almost two years ago. Many results have been finalized since then but there are also analyses still in progress especially for the combination of data from the four experiments. I will present some highlights of the precision electroweak results, explain how they fit in our picture of the Standard Model, and discuss the limits on new physics that can be derived from these measurements. The physics program at LEP1 was dominated by the study of Z decays into pairs of fermions. I will concentrate on the results derived at higher energies for a variety of final states. Although fermion-pair production is still a major channel, the electroweak gauge bosons (the photon, the Z and the W) can be pair produced at LEP2. Consequently LEP enables the measurement of most couplings and I will compare these values to the expectations of the Standard Model.

Contact Person: Gerald Oakham

Andy Adler (SITE, University of Ottawa) : Electrical Impedance Tomography- Image Reconstruction and Applications

Monday, October 28, 2002
Location: HP 4351
Time: 3:30PM

Abstract: EIT is a relatively new approach to medical imaging, where body surface electrodes are used to apply small currents and make measurements from which images of the conductivity distribution within the body are generated. The flow of air and fluids due to physiological activities can be imaged using this technique. While EIT is inherently a relatively low resolution imaging technique, it offers unique advantages which we would like to explore.

EIT hardware is much simpler than most other imaging modalities, and the equipment is therefore much less expensive. The technology simply requires attaching electrodes to the patient; and can be used to continuously monitor the patient indefinitely. These advantages of EIT, 1) inexpensive, 2) simple to use, 3) non-invasive and non-cumbersome to the patient, and 4) applicable to continuous monitoring, allow for several exciting possibilities for the use of EIT.

Image reconstruction for EIT data is known to be a hard problem. EIT images suffer from numerous artefacts caused by measurement noise, electrode movement and the ill-conditioned nature of image reconstruction of the inverse Laplace equation. We use an imaging algorithm based on Bayesian regularization to explicitly model the a priori knowledge.

This talk will discuss: 1) Imaging Algorithms in EIT, 2) Applications of EIT for monitoring gas and fluid volumes and flows.

Contact Person: Giles Santyr

Stephen Mihailov (CRC): Recent Research in the Optical Communications and Electrophotonics Group at the Communications Research Centre

Monday, November 18, 2002
Location: HP 4351
Time: 3:30PM

Abstract: At the Communications Research Centre, recent research in the Optical Communications and Electrophotonics Group has been focused on the exploitation of UV-induced photosensitivity in optical fiber and waveguides in order to fabricate a wide variety of passive devices for applications in optical communications, especially for Wavelength Division Multiplexing (WDM). With single channel data rates reaching 40 G-bit/sec, there is increasing difficulty pushing the transmission rates higher because of electronics limitations. In the optical domain, issues of chromatic and polarization mode dispersion introduce additional limitations. In this talk, techniques for inscription of Bragg grating based devices in fibers and waveguides for optical Add/Drop filters, chromatic dispersion compensation, polarization dependent loss equalization and polarization mode dispersion compensation will be discussed.

Contact Person: Gerald Oakham

D. W. O. Rogers (Institute for National Measurement Standards - NRC): Radiation Transport by Monte Carlo - From High Energy Physics to the Clinic

Thursday, November 28, 2002
Location: HP 4351
Time: 16:00PM

Abstract: Monte Carlo techniques for simulating radiation transport have become increasingly important as the software tools and hardware costs have both improved. This talk covers the history of simulating electron and photon transport using Monte Carlo techniques at NRC. It starts with the EGS3 code which was developed for High Energy Physics applications at SLAC, and continues to EGS4 and EGSnrc which have become the `gold standard' for medical physics applications in this field. The BEAM code, based on EGSnrc, and the VMC++ code developed by NRC's Iwan Kawrakow are both being extensively used/licensed by commercial treatment planning companies and soon should be widely available in cancer clinics.

Contact Person: Giles Santyr

OCIP Fall Student Seminar

Tuesday, December 3, 2002
Location: MACDONALD HALL: ROOM 146 (University of Ottawa)

9:30- Elena Olariu: "Monte Carlo studies of the Magnetic Resonance diffusion decay"

10:00 - Xiaodong Zeng: "Characterization and Application of Brillouin Scattering Based Distributed Fiber Optic Sensor"

10:30 Break: MacDonald 148 (coffee will be served)

11:00- Marcelo Valdes: "Tree level processes in QED in the LF; formulationof electro-weak theory in LF"

11:30- Simona Crisan: "Equilibrium dynamics of random linear polymers"

12:00 - Darren Grant: "Salt phase signal extraction at the Sudbury Neutrino Observatory"

Contact Person: Gerald Oakham

John Schreiner (Kingston Regional Cancer Centre and Queen's University) : Notes From a Small Clinic: Conformal Radiation Therapy Research in Co-60 Tomotherapy and Gel Dosimetry

Thursday, January 23, 2003
Location: HP 4351
Time: 3:30PM

Abstract: Recent developments in radiation therapy have focused on Intensity Modulated Radiation Therapy (IMRT), an implementation of external beam therapy that better conforms the delivered dose to the target, while sparing normal tissue. In Kingston, we have been investigating two aspects of IMRT: problems of dose delivery and of dose measurement. The work is well represented by investigations of a novel approach to radiation delivery termed tomotherapy, in which radiation dose is delivered dynamically to a volume by modulating the intensity from a narrow radiation fan beam as it revolves around the volume. An advantage of tomotherapy over conventional IMRT is that the design of the radiation unit inherently provides the ability to incorporate computed tomography (CT) imaging at time of treatment, for patient set-up verification. In this talk, I will review our research of the feasibility of using Cobalt-60 as the radiation source for tomotherapy. Results showing the excellent potential for complex dose delivery and megavoltage x-ray CT imaging (termed MVCT) with Co-60 tomotherapy will be presented. In this review, it will be made clear that very complex dose patterns can be achieved with IMRT. This introduces problems for the radiation physicist, as conventional dosimetry techniques do not provide convenient or practical clinical three-dimensional dosimetry required for IMRT. A potential solution, gel dosimetry, will be described and the considerable research challenges still facing us in the development of this technique will be illustrated by reviewing some recent work at the KRCC. The talk will hopefully illustrate that it is quite possible to do innovative research in a small cancer centre. This project is supported through funding from the Kingston Regional Cancer Centre, the MDS Nordion/ Cancer Care Ontario Research Initiative, the Canadian Institutes of Health Research, and the Ontario Research and Development Challenge Fund (OCITS Project) in partnership with MDS-Nordion.

Contact Person: Pat Kalyniak

Manuella Vincter (University of Alberta): Recent Results from HERMES: the state of the art in Nucleon Spin Structure

Monday, January 27, 2003
Location: HP 4351
Time: 3:30PM

Abstract: The proton is an essential component of our everyday experience. However, it is only in the last three decades that the rich internal structure of the proton has been revealed. One of the most remarkable outcomes of the detailed study of the structure of the proton is that its basic constituents, the quarks, contribute relatively little to the spin-1/2 nature of the proton. The puzzle remains today: how do the constituents of the proton conspire to generate the spin of the proton? The HERMES experiment at the DESY Laboratory in Hamburg, Germany is addressing this question. This seminar will present the state of the art in this field of research and will detail the different approaches to measuring all possible contributions to the spin of the proton.

Contact Person: Pat Kalyniak

Andreas Warburton (McGill): Rare Changes in Quark Flavour: Measuring the CKM Matrix Element |Vub |

Monday, February 3, 2003
Location: HP 4351
Time: 3:30PM

Abstract: The Cornell Electron Storage Ring (CESR) has provided the highest luminosity collisions between energy-symmetric beams of electrons and positrons. I will discuss new results on how 19.2 million B mesons, products of these e + e- collisions that have been recorded by the CLEO detector, are being used to study the strength (|Vub|) of the rare weak flavour transition from a bottom quark into an up quark. The value of |Vub|, a fundamental parameter of Nature, forms a key element of the Cabibbo-Kobayashi-Maskawa (CKM) quark-mixing matrix, which encodes much of our knowledge of the number of quark generations, the weak interactions between quarks, and the degree of CP violation.

Contact Person: Alain Bellerive

Garry Tarr (Dept. of Electronics): RADFETs and Radon: Detecting Ionizing Radiation Using Commercial CMOS Technology

Monday, February 10, 2003
Location: HP 4351
Time: 3:30PM

Abstract: Over the past two decades the "silicon foundry" concept has advanced to the point where custom CMOS integrated circuits can be designed for specific applications and produced in very small quantities at low cost. This talk explores the use of foundry CMOS ICs for radiation detection and dosimetry. It is shown that floating gate MOSFETs can be used as gamma ray dosimeters with resolution below 10 mGy. These devices may find application in radiotherapy, spacecraft dosimetry, and in radiation sterilization. It is also shown that custom-designed memory cells resembling those used in DRAMs can serve as efficient alpha particle detectors. An array of these alpha-sensing cells has been used to measure radon concentration in air, and could be applied to produce an inexpensive radon monitor for consumer use.

Contact Person: Giles Santyr

Roger Moore (Michigan State University): The D0 Detector and the Search for Supersymmetry

Monday, February 17, 2003
Location: HP 4351
Time: 3:30PM

Abstract: The Standard Model has been a remarkably accurate description of the interactions of matter at high energies which has stood the test of time for over 20 years. The D0 experiment probes the Standard Model at higher energies than have previously been achievable. To do this D0 uses what is currently the world's highest energy accelerator, the Tevatron at Fermilab, which collides proton and anti-proton beams at a centre-of-mass energy of 1.96TeV. The D0 detector previously ran from 1992 to 1996 when it shared the discovery of the top quark with CDF. Both the Tevatron collider and the D0 detector have recently undergone significant upgrades to handle a factor 20 increase in the luminosity. The new

Run IIa period started in March 2001. An overview of the D0 detector and physics program will be presented and the latest results of the search for Supersymmetry will be discussed. Supersymmetry is one candidate for new physics beyond the Standard Model.

Contact Person: Pat Kalyniak

Ian Thomson (Thomson & Nielsen Electronics Ltd., Ottawa): Principles & Applications of MOSFET Radiation Sensors in Medicine & Space

Monday, February 24, 2003
Location: HP 4351
Time: 3:30PM

Abstract: Thomson Nielsen has developed ionizing radiation dosimeters based on MOSFET technology specifically for medical and space applications. This unique technology has been developed in Ottawa with collaboration with Carleton University, NRC Ionizing Radiation Standards Laboratory and the Ottawa Regional Cancer Center. This seminar gives an overview of the physics of MOSFET dosimeter design and operation followed by details of medical systems currently used in radiotherapy and radiology departments of hospitals. The challenges of innovating with new technology while meeting strict medical standards are discussed with specific examples of medical applications. Over the last year a specially designed radiation dosimetry system based on Thomson Nielsen's MOSFETs has flown on International Space Station as part of an experiment called "EVARM" (EVA Radiation Monitor). This dosimetry system has been used to determine doses to astronauts during EVA (spacewalks). In this seminar space radiation and the EVARM experiment will be discussed. The latest data from EVARM will be presented and discussed in relationship to the space radiation environment.

Contact Person: Giles Santyr

Scott Oser (University of Pennsylvania): Neutrino Oscillation Results from the Sudbury Neutrino Observatory

Tuesday, February 25, 2003
Location: HP 5115
Time: 3:30PM

Abstract: The Sudbury Neutrino Observatory (SNO) has determined the flavor content of the ^{8}B solar neutrino flux by measuring the rates of charged current and neutral current neutrino interactions on deuterium. These results directly demonstrate neutrino flavor transformation at greater than 5 standard deviation significance. The total flux of ^{8}B neutrinos is found to be in good agreement with solar model predictions. Measurements of the day and night neutrino energy spectra probe models of neutrino oscillation. A global fit of SNO data and results from other solar neutrino experiments to neutrino oscillation models strongly favors the Large Mixing Angle (LMA) MSW solution.

Contact Person: Richard Hemingway

Thomas Devereaux (University of Waterloo) : CAP Lecture - From Colliding Atoms to Colliding Galaxies - The Complete Dynamics of Interacting Systems

Wednesday February 26, 2003
Location: Alumni Boardroom - Robertson Hall room 617
Time: 3:30pm

Abstract : From colliding atoms to colliding galaxies, the dynamics of interacting systems remains one of the most important and vexing problems touching many areas of astronomy, biology, chemistry and physics. Computational physics has become tremendously useful to address "many body physics" as computers have become cheaper and more powerful. After a brief perspective view of computational approaches, I will focus attention on condensed matter physics and discuss how numerical approaches can be used to aid in understanding the complex dynamics of superconductors in magnetic fields.

Contact Person: Alain Bellerive

Isabel Trigger (CERN): Desperately Seeking SUSY

Thursday, February 27, 2003
Location: HP5115
Time: 3:30pm

Abstract: The theory of supersymmetry has existed for over thirty years. It remains possibly the only consistent theory extending the Standard Model to higher energies which is not experimentally excluded, and it still enjoys enormous popularity. Now that the final data from the LEP experiments have been analyzed, we can look back over what LEP was expected to discover about supersymmetry and what was actually found. I will review the current situation and discuss prospects for supersymmetry from current and future experiments. I will also try to answer the commonly asked question: "When are you going to give up on SUSY and just look for something else?"

Contact Person: Richard Hemingway

Wendy Taylor (SUNY at Stony Brook): Physics with b-Quarks at the Tevatron

Friday, February 28, 2003
Location: HP5115
Time: 3:30pm

Abstract: The Fermilab Tevatron proton-antiproton collider is the highest energy collider in the world, and will remain so until 2008, when the LHC at CERN turns on. Run II at the Tevatron is underway. Commissioning of the DZero experiment is nearing completion and the DZero detector is now collecting physics-quality data. In this talk, the DZero experiment will be briefly described. The Silicon Track Trigger, a novel device for triggering on displaced tracks from b-quark decays, will be presented. The b-quark physics program at DZero will be discussed and recent results will be shown. Prospects of the B physics potential of DZero over the next few years will be illustrated, as will be the possibility of discovering the Higgs boson at the Tevatron.

Contact Person: Richard Hemingway

David Sinclair (Carleton - SNOLAB Facility Development Director):

Scientific Breakthroughs at the Sudbury Neutrino Observatory

Wednesday, March 05, 2003

DAVIDSON DUNTON RESEARCH LECTURER FOR 2002
Location: Senate Room
Time: 4:30PM

Abstract: The recent discoveries by the Sudbury Neutrino Observatory have attracted world acclaim. This talk will present the results in their historical context and outline the significance of the results to our understanding of elementary particle physics, solar physics, supernovae and cosmology. The results leave many un-answered questions and new initiatives to address these issues will be introduced. The talk is intended for the general public.

Scott Menary (York): The Physics and Status of KaNOE - Kenora Off-Axis NuMI Oscillation Experiment

Monday, March 10, 2003
Location: HP 4351
Time: 3:30PM

Abstract: The evidence for neutrino oscillations from SuperK and SNO leads to a picture of neutrino mixing that is analogous to quark mixing. And like the CKM matrix for quarks, the neutrino mixing matrix, the PMNS matrix, has 4 independent parameters - usually taken as three angles and a complex phase. And again in analogy to the quark sector, this complex phase allows for CP Violation. The SuperK, SNO, and KAMLand results constrain the two of the angles as well as the neutrino mass differences. I will describe a new experiment proposed to use the neutrino beam from Fermilab's NuMI facility to measure the other angle of the PMNS matrix and to hunt for CP Violation in the neutrino sector. The status of the experiment as well as the physics reasons for locating the experiment in Ontario will be illuminated.

Contact Person: Alain Bellerive

Steve Robertson (SLAC): Recent rare B decay results from the BaBar experiment

Wednesday, March 12, 2003
Location: HP5115
Time: 3:30pm

Abstract: The unprecedented luminosities achieved by the the SLAC and KEK B-factories provide fertile ground for searches for rare B meson decays. The large size of the current BaBar data set, corresponding to approximately 100 million Upsilon(4s) -> BB events, has also permitted the use of novel methods to search for ``difficult'' rare decay modes such as those possessing multiple unobserved neutrinos. The results of recent searches for several rare semileptonic B decay modes are presented, and the prospects for future discoveries are discussed.

Contact Person: Richard Hemingway

Dipak Basu (Carleton): Peaks and troughs in QSO redshift distribution:

real or artifact?

Monday, March 17, 2003
Location: HP 4351
Time: 3:30PM

Abstract: Quasi Stellar Objects (QSOs) are extremely luminous objects exhibiting large redshifts. It is believed that the mystery of QSOs is associated with the mystery of their large redshift values. On the other hand, measurement of redshifts is based on identification of observed spectral lines with search lines known in the laboratory. Redshift distribution exhibits peaks and troughs leading to possible periodicities. The distribution of redshifts of QSOs has been used for diverse purposes, most importantly, for cosmological models. Hence the importance of investigating the true nature of the distribution. Are the peaks and troughs real? Do they represent any periodicity? Or, are they effects of observational selection? Or, are they artefact of analyses? The presentation will attempt to answer these questions.

Contact Person: Alain Bellerive

Bruce Campbell (U of Alberta): Constraints On Scalar Couplings From pi -> l nu Decay

Thursday, March 20, 2003
Location: HP 5115
Time: 11:30AM

Abstract: After a review of the standard model of particles and their interactions, we discuss the role that the left-handed nature (chirality) of the weak interactions plays in the leptonic decay of the pion. It is well known that this makes pi -> l nu decay an ideal searching ground for new pseudoscalar interactions beyond the standard model. We then discuss how weak radiative corrections permit new scalar interactions to also contribute to pion decay. Constraints on the underlying scalar interactions, from limits on their induced pseudoscalar contributions to pion decay, can be substantially stronger than the direct experimental limits on scalar interactions from beta-decay measurements.

Contact Person: Pat Kalyniak

Alain Gauvin (Centre Hospitalier de l'Universite de Montreal): Implementation of PACS in a Large Teaching Hospital

Monday, March 24, 2003
Location: HP 4351
Time: 3:30PM

Abstract: Technological advances in medical imaging have allowed for the conversion of most acquisition systems to a digital mode of operation. The digital images so produced were generally converted to hardcopy for transport, viewing and archiving. Picture Archiving and Communication Systems (PACS) now allow for those images to remain in digital form beyond their acquisition. This involves the purchase of a large set of hardware and software, but more importantly, it causes the operations of a medical imaging group to be modified considerably. This talk will discuss the implementation of a PACS in a large teaching hospital (400,000 studies per year).

Contact Person: Paul Johns

Thomas Brabec (U of Ottawa): Ultrafast photonics

Monday, March 31, 2003
Location: HP 4351
Time: 3:30PM

Abstract: An overview will be given over hot topics in physical photonics. The main part of the talk will focus on ultrashort and ultrahigh intensity laser interactions with matter. Areas of application include solid state, atomic, molecular, plasma, and nuclear physics.

Contact Person: Alain Bellerive

PHYS 4909 Honours Project Seminars

Monday, April 28, 2003
Location: HP 4351
Time: 1:30PM

Matthew Chrysler : Test cell for a Proportional Counter for a Whole Body Detector

Abstract: Whole body detectors are used in industry to determine the amount ofradiation contamination a worker's clothes has received. They use a large number of proportional detector modules to detect alpha and beta rays. Themodules need to be inexpensive, simple to make, durable and easily replaceable. The intent of this project was to design a single wire and U-channel (C-channel, square horseshoe) detector. The U-channel will be used to allow a thin window to be added on the open side so the alpha radiation can enter. Then testing it to ensure that it worked as expected.

Brendan Lake : Temperature, Steady State and Transient Regime Analysis Using Stimulated Brillouin Scattering(SBS)

Abstract: An acoustic phonon field can be found in any optical fibre above abosolute zero. These phonons present a direct link to the temperature and physical strain that the fibre is under. A continuous wave(CW) of light that is inelastically scattered from these phonons will experience a frequency shift proportional to the temperature and strain of the fibre. This is a higher order effect that can be amplified by using a couter propagating pulse wave. Results will be presented for a 2km fibre under three separate regions of temperature to observe the Brillouin gain spectrums. The phonon has a lifetime of approximately 10ns; optical pulses with durations less than this, used is SBS, will cause transient effects that can be used to observe the response time of the material. A comparison of the solutions provided by the steady state and three coupled equations to the CW depletion in a 20m optical fibre at room temperature with a pulse width of 2ns will also be presented.

Adam Hill : Ensemble Tests of the Pure D_2O Data From the Sudbury Neutrino Observatory

Abstract : The SNO Collaboration recently released strong evidence of neutrino oscillations by confirming the presence of fluxes of mu and tau neutrinos, demonstrated by the detection of the NC, CC and ES reactions.Concerns remain whether the fitting process used to extract these results is free of biases. To this end I have performed monte carlo simulations using SNOMAN which have been compared to the accumulated data from the pure D_2O phase. Evidence of a bias in the fitter and an overestimation of the errors is evident in the analysis of the data.

Osama Moussa : What the CC at the SNO can tell us about the MSW

Abstract : Recent results from the Sudbury Neutrino Observatory (SNO) provide strong evidence for neutrino oscillations. SNO may also be sensitive to the distortion of the solar neutrino energy spectrum, which depends upon the values of the neutrino-oscillation parameters. How can the charged current (CC) energy spectrum--as observed in SNO- constrain the

allowed regions in oscillation-parameters space (known as the MSW-plane)

Contact Person : Pat Kalyniak

PHYS 4909 Honours Project Seminars

Wednesday, April 30, 2003
Location: HP 4351
Time: 9:00AM

Pascal Elahi : Supernova Neutrinos and the Sudbury Neutrino Observatory

Abstract: One of the central problems in supernova theory is a question as to how massive stars explode which is important for understanding nucleosynthesis, the general distribution of heavy elements throughout the galaxy and a host of other properties. Several important questions in physics are whether neutrinos have mass, what the masses are and whether neutrinos oscillate, that is whether the weak eigenstates do not correspond to the physical mass eigenstates. One can explore the possible answers to these questions by studying the neutrino emissions of supernova. Simulations of the various supernova models produce extremely high neutrino luminosity and is thus of great interest to the physics community. The Sudbury Neutrino Observatory (SNO) is an ideal location to do both supernova and neutrino physics. In this report, the signals produced by in SNO by a type II supernova are presented for a specific supernova model. A Monte Carlo simulator (SNOMAN) was used to produce the expected signals which were in turn used to produce probability distribution functions (PDF). The pdf's can then be used to fit for the number of events and flux. These were also analyzed to extract the energy and direction of the incoming neutrinos and when possible. The signals were also used to train a neural network (NN) so signals can be differentiated in low count events such as the SN1987A event which occurred in the Large Magellanic Cloud. An important aspect of low count events is the tagging of nuebar. The data was analyzed to find the ideal cuts for separating the positron from the neutrons in such events resulting in a purity of separation of 0.90-0.95. The efficiency of double neutron coincidences with a positron was found for a variety of time and spatial windows which were in turn dependent on the flux. Finally, a black hole cutoff in the neutrino signal was used to explore the effect on the signals produced in SNO. The number of delayed counts and the time delay and the black hole formation time were calculated for various distances for both early and late black hole formation.

Rowan Thomson : The Impact of the Number of Neutrino Families on Big Bang Nucleosynthesis

Abstract : One of the great successes of cosmology is the agreement between observed light element abundances and the predictions from big bang nucleosynthesis theory. According to the big bang model, the early universe was filled with a plasma of photons, neutrinos, electrons, muons, protons, and neutrons, all in thermal equilibrium. As the universe expanded and cooled, the rates of reactions maintaining particles in thermal equilibrium slowed until particle species decoupled from the plasma. Nucleons decoupled at a temperature of about 1MeV, with a neutron to proton ratio of n/p = exp[(m_n-m_p)c^2/kT], which decreased slowly with time as neutrons decayed. Shortly after the nucleons froze out, nuclear reactions became important. The abundances of light elements produced depended on n/p. This ratio was sensitive to the temperature at nucleon decoupling and the time between decoupling and the start of nucleosynthesis. Both of these factors depended on the number of neutrino families. This presentation will focus on how the number of neutrino families affected primordial nucleosynthesis in the context of big bang cosmology.

Sara St. James : Control of steady state heating with ultrasound interstitial waveguide applicators

Abstract: Previous studies have shown that temperature elevations required to treat cancerous tumors via hyperthermia can be obtained using an interstitial ultrasound waveguide applicator. Formerly, the temperature elevation in the volume of interest was determined by an array of temperature sensors in the sample. In an attempt to do away with the array of temperature sensors, a modified applicator was designed with a channel for an internal temperature sensor. Finite element analysis simulations show it is possible to predict the heating in the volume of interest from the temperature measured at the tip of the applicator. Experiments in tissue mimicking phantoms have led to the conclusion that the temperature measured at the tip of the applicator is a good qualitative indicator of the treatment.

Tyler Punkari : Pade Approximants - Theory and Application

Abstract: Given a power series expansion for a function about a point, there are a number of limitations on one's knowledge of the function outside the radius of convergence of the series and in the vicinity of the poles and zeroes of the function. Pade approximants are easily derived from the coefficients of a power series expansion, convergent or not, and can be shown to extend the radius of convergence with much less calculation than the analytic continuation method for Taylor series. In addition to this, Pade approximants are valid in the neighbourhood of the poles and zeroes of a function independent of the convergence properties of the expansion of the energy eigenvalues.

Contact Person : Pat Kalyniak

Dr. Paul Johns (Carleton University) : Diagnostic Information from Scattered X Rays

Thursday May 29, 2003
Location: HP 4351
Time: 12 Noon

Abstract : All medical x-ray imaging today is done by using the x rays transmitted through the patient, without interaction, to the detector. Up to 90% of the photons approaching the image receptor, however, have been coherently or incoherently scattered, and an alternative is to use them to generate the image. Thus, scattered radiation would be no longer just a nuisance to be suppressed, but a new source of information. In this seminar a general introduction to medical physics and x-ray imaging will be given. The underlying physics of scatter imaging will be summarized, and our work on measuring the differential cross sections or form factors will be summarized.

Contact Person : Pat Kalyniak

Dr. David Waller (Carleton University) : There's NO Business like SNO Business

Thursday June 5, 2003
Location: HP 4351
Time: 12 Noon

Abstract : TBA

Contact Person : Pat Kalyniak

Dr. Julia Wallace (Carleton University) : MRI

Thursday June 12, 2003
Location: HP 4351
Time: 12 Noon

Abstract : TBA

Contact Person : Pat Kalyniak

Dr. Richard Hemingway (Carleton University) : LEP Physics

Thursday June 19, 2003
Location: HP 4351
Time: 12 Noon

Abstract : TBA

Contact Person : Pat Kalyniak

Dr. Ferenc Dalnoki-Veress (Carleton University) : SNO

Thursday June 26, 2003
Location: HP 4351
Time: 12 Noon

Abstract : TBA

Contact Person : Pat Kalyniak

Mike Donkers (Carleton University) : LEP Physics

Thursday July 10, 2003
Location: HP 4351
Time: 12 Noon

Abstract : TBA

Contact Person : Pat Kalyniak

Dr. Gerald Oakham (Carleton University) : ATLAS

Thursday July 17 , 2003
Location: HP 4351
Time: 12 Noon

Abstract : TBA

Contact Person : Pat Kalyniak

Dr. Alain Bellerive (Carleton University) : SNO

Thursday July 25, 2003
Location: HP 4351
Time: 12 Noon

Abstract : TBA

Contact Person : Pat Kalyniak

Dr. John Armitage (Carleton University) : Long-Period Fibre Bragg Gratings

Thursday August 7, 2003
Location: HP 4351
Time: 12 Noon

Abstract : TBA

Contact Person : Pat Kalyniak