



July Meeting- PUBLIC LECTURE
Australian Institute of Physics – NSW Branch

Chernobyl Disaster to Modern Radiation Oncology Dosimetry

Professor Anatoly Rosenfeld
Centre for Medical Radiation Physics, University of Wollongong

Friday 7th July @ 6.00PM
Slade Lecture Theatre, School of Physics, University of Sydney

Summary of talk:

Twenty years has passed since the Chernobyl nuclear power plant accident, which was an incredible lesson for mankind in order to be ready for an extraordinary radiation accident. The events are still in my memory and will be reviewed during the first half of this presentation, including personal photographs and experiences immediately after the accident. The second half of this presentation will concentrate on new developments in solid state dosimetry related to modern radiation oncology modalities that have arisen after the Chernobyl disaster.

One of the important lessons I learnt from my participation in the liquidation of the accident was the absence, at that time, of instrumentation for biological dosimetry in complex mixed radiation fields (gamma, beta, alphas and neutrons) to monitor the radiation dose from such “liquidators”. Since the Chernobyl accident an essential part of my scientific career has been devoted to the development of new approaches to radiation dosimetry for radiation therapy, radiology and radiation protection. During the last decade much R&D in the field of semiconductor radiation detectors for dosimetry has been carried out for the improvement of cancer treatment on conventional and new radiation oncology modalities. Such modalities include electron LINAC, brachytherapy for prostate cancer, neutron, proton and microbeam synchrotron radiation therapies. A new approach for biological dosimetry based on silicon microdosimetry has been developed and is under implementation for radiation protection in space missions in collaboration with NASA. Recent research at the Centre for Medical Radiation Physics, University of Wollongong, in collaboration with ANSTO, ARC Centre of Excellence for Quantum Computer Technology, UNSW and USA collaborators are directed toward the development of individual microdosimeters for measurements of biological doses for terrestrial and avionics applications. The next step in measurements of radiation biological effects is semiconductor nano-dosimetry on the DNA level. Challenges related to this will be discussed.





Brief Biography of the Speaker:

Anatoly Rosenfeld is a Professor at the University of Wollongong, School of Engineering Physics. Anatoly was born in Kiev, Ukraine and moved to Australia in 1992. He fulfilled his MSc(Hon) in semiconductor physics and Doctorate in radiation physics at Leningrad Polytechnic Institute and Institute for Nuclear Research (Ukraine) respectively. His scientific interest is in development of innovative radiation semiconductor detectors and instrumentation based on them for radiation dosimetry, microdosimetry and nanodosimetry for radiation therapy including hadron and synchrotron therapies, space applications and medical imaging. He enjoys tertiary teaching in this field and actively contributing to development of medical radiation physics program at the University of Wollongong.

Anatoly is the founder and Director of the Centre for Medical Radiation Physics at the University of Wollongong, which is a major provider of education and multidisciplinary research in medical radiation physics in Australia. He is a founding member of the Australian Proton Therapy Steering Committee. He currently serves on many international committees including IEEE Radiation Instrumentation Steering Committee (RISC), IEEE NPSS International Committee, Solid State Dosimetry Scientific Advisory Committee, AFOMP research committee and International Advisory Board on Microdosimetry (MICROS 2005). He is a member of Editorial Board of Journal of Instrumentation (JINT) and actively promoting collaboration with top radiation oncology institutions and ANSTO, he served as UoW councillor and member specialist committee at AINSE.

Detailed Schedule for Friday, 7 July 2006:

- **6:00-6.30 pm** **Drinks and nibbles, Slade Lecture Theatre.**
- **6.35-7.30 pm** **Lecture by Professor Anatoly Rosenfeld.**
- **8.00 pm** **Dinner with the Speaker at Buon Gusto (Italian),
368 Abercrombie Street, Chippendale.**
E-mail Dr Fred Osman if you will be able to join us for dinner.

Travel Directions:

- Train to Redfern station and walk to the School of Physics.
- Buses 422, 423, 426, 428, 448, and 450 from Circular Quay to City Road / King, or 412, 435, 438, 470, 483 etc. along Parramatta Road from Circular Quay.
- Drive and park in various parking lots. You will need to pay for parking (\$6 flat-rate after 4 pm) and display the ticket in your car. You may also find parking places on public roads outside the Uni.

