

**Report of April 2012 Meeting  
Royal Society  
Southern Highlands Branch**

**Speaker: Dr Anatoly Rosenfeld, Centre for Medical Radiation  
Physics, University of Wollongong**

**Topic: Advanced Radiation Oncology Modalities for Cancer  
Treatment: Current Status and Verification of  
Treatment Delivery**

Over recent years, radiation therapy has become more and more the treatment of choice in cancer treatment. While rapid advances in the field of medical radiation physics have made this possible, there have been many documented cases of accidents in Radiotherapy and Diagnostic Radiation, where Quality Assurance in delivery methods has not kept pace with the increasing uses of radiation therapy.

Dr Anatoly Rosenfeld opened his lecture with statistical evidence of recent accidents in Radiotherapy and Diagnostic Radiation. He quoted the U.S. Food and Drug Administration (FDA) figures as at October 2009, where 206 patients were known to have been exposed to excess radiation at one prominent facility. As at October 2010, the agency was aware of approximately 385 patients from six hospitals who were exposed to excess radiation during CT brain scan perfusions. He gave many other examples where there was a large gap between delivery technology and Quality Assurance methods.

Dr Rosenfeld's scientific interest and major international contribution is in the development of innovative radiation instrumentation for real time medical radiation dosimetry, microdosimetry and nanodosimetry for Quality Assurance in radiation therapy including IMRT, IGRT, prostate cancer brachytherapy, proton therapy, heavy ions and synchrotron microbeam radiation therapies. He also has a strong interest in translational research in prostate cancer radiation treatment.

In this highly technical and burgeoning field, Dr Rosenfeld is currently leading a cohort of fifty Ph.D. students. His research has led to a strong collaboration between the Centre for Medical Radiation Physics at Wollongong(CMRP) and top American radiation oncology institutions, including the Memorial Sloan-Kettering Cancer Centre in New York.

Incredible progress has been achieved over the last decade in new radiation oncology modalities. These complex techniques allow the delivery of radiation to the tumour only, sparing normal tissue. The newly invented instruments coming out of Dr Anatoly

Rosenfeld's research are allowing verification of treatment delivery and minimization of error in radiation therapy.

This wide-ranging and inspiring lecture covered not only the Quality Assurance developments that are changing the lives of Australians and people worldwide in cancer treatment, but also the CMRP research in developing radiation protection for space missions and individual radiation protections. Anatoly Rosenfeld also spoke of his experiences at Chernobyl, and of his recent visit to the nuclear accident at Fukushima, and the conclusions and comparisons he has drawn at each site. The 35 member audience was clearly delighted with the long question time that followed, and its continuation over dinner.

Anne Wood