



Overview of research from Medical Physics Research Cluster (MPRC), NUI Galway

Dr Mark Foley

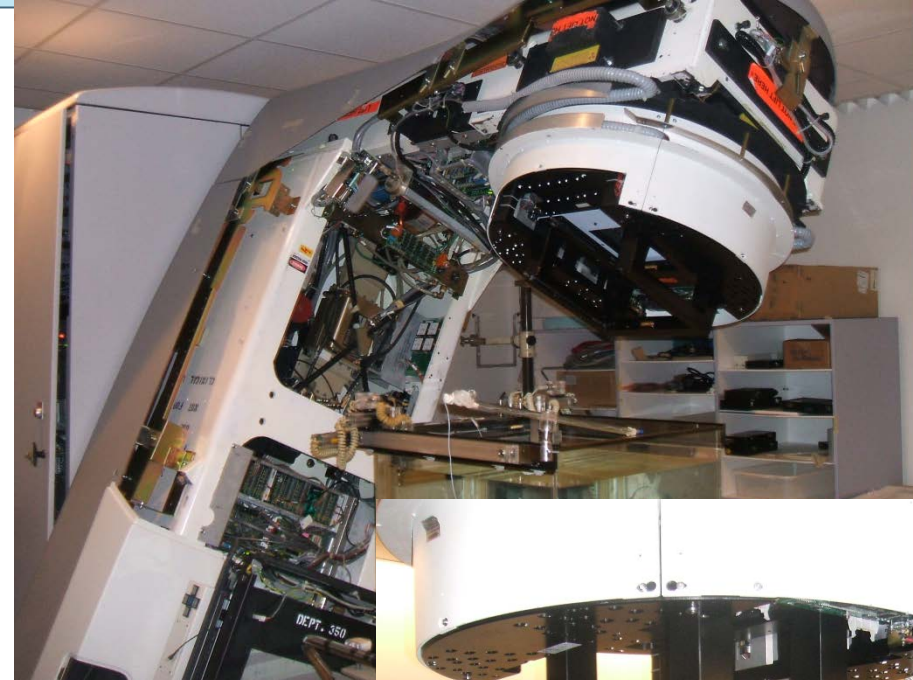
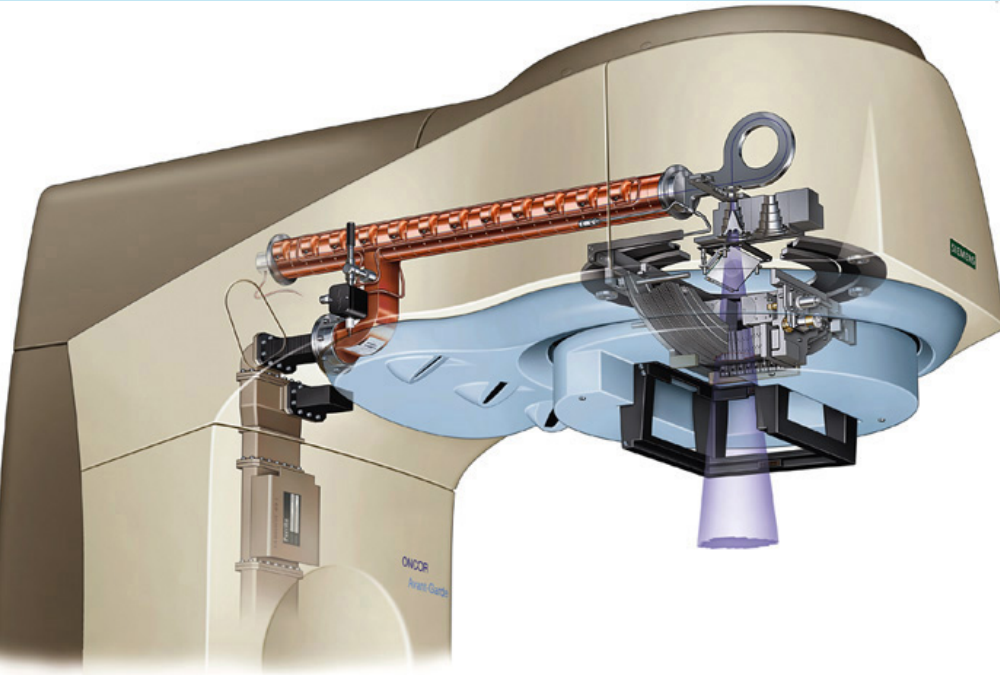
School of Physics

7th September 2012





Monte Carlo simulations in Radiotherapy



***Faddegon, Sawkey, O'Shea et al. Med Phys, 2009**

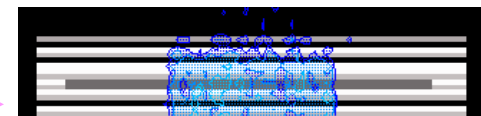
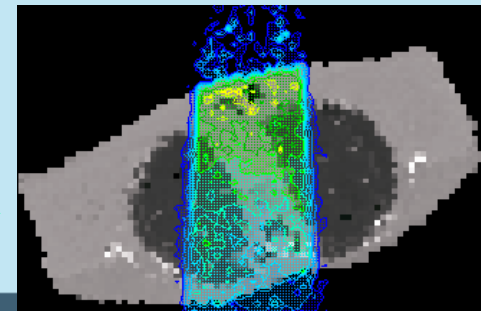
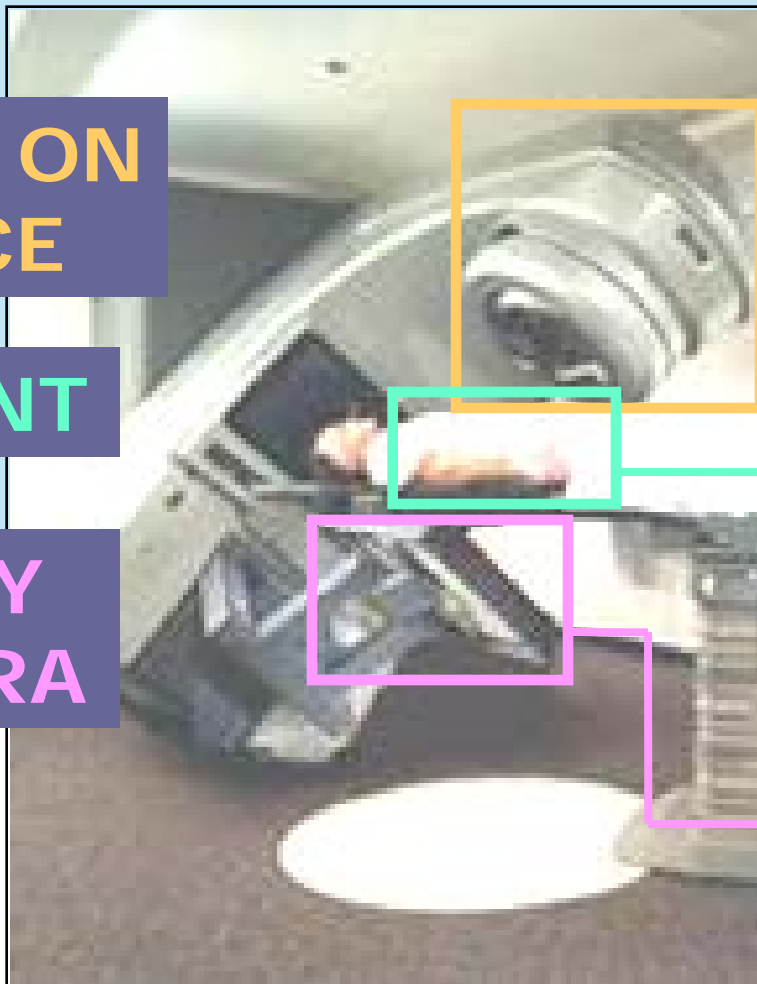


Monte Carlo simulations in Radiotherapy

**RADIATION
SOURCE**

PATIENT

**X-RAY
CAMERA**





Monte Carlo simulations in Radiotherapy

- Investigations included:
 - Monte Carlo simulation of a clinical LINAC photon/electron treatment head to improve the accuracy of the beam data at the phantom or patient surface
 - The use of an add-on multi-leaf collimator for collimation of electron beams
 - Use the tuned Varian linac model to recalculate and hence evaluate 2 different IMRT QA methods.

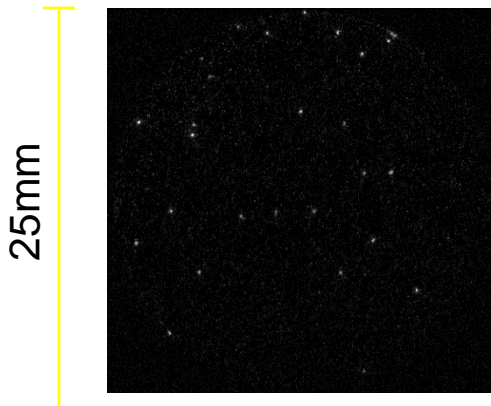
Monte Carlo Modelling of Gold Nanoparticle Aided Radiotherapy at Megavoltage Energies.



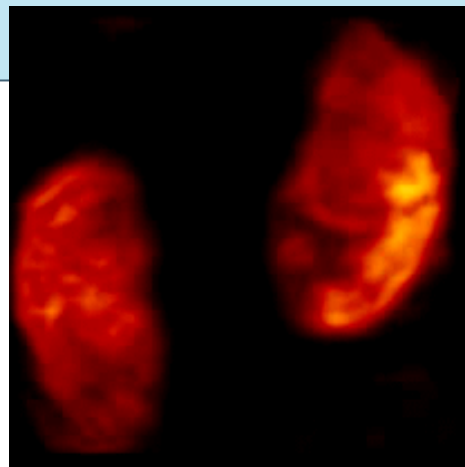


BazookaSPECT

I-125



25mm



Mouse Kidney SPECT using ^{99m}Tc

Tc-99m



CCD



Optical System

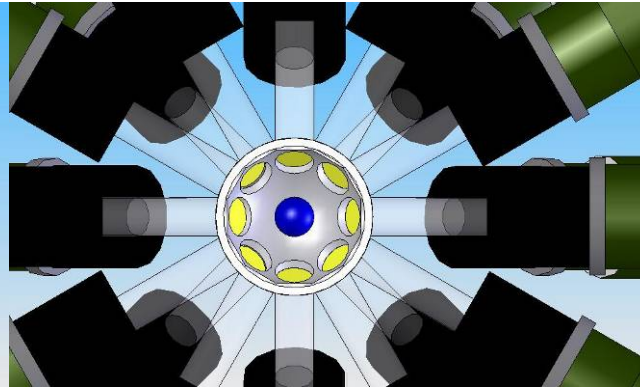
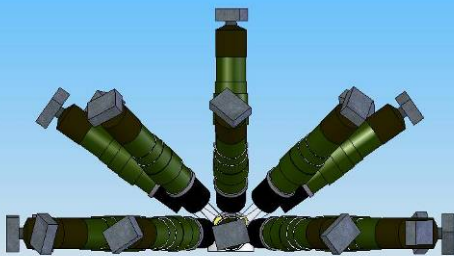


Gen 2/3
Image Intensifier

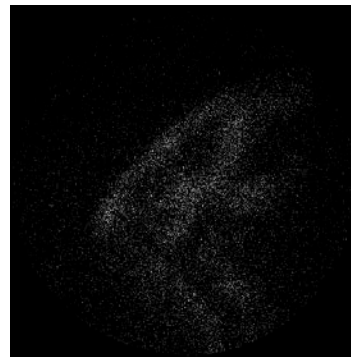


FastSPECT III

Dedicated Rodent Brain Imager



March 2007



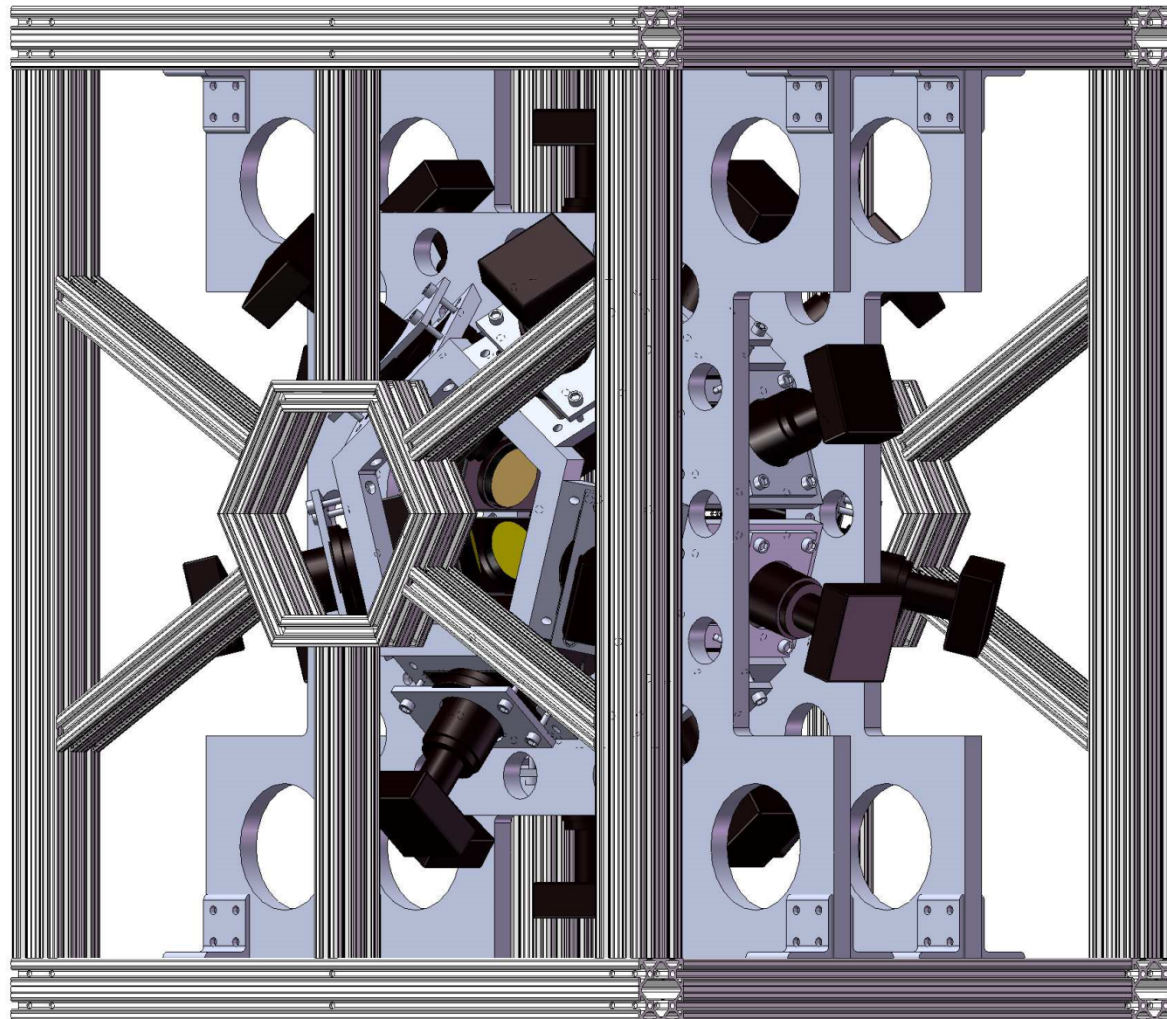


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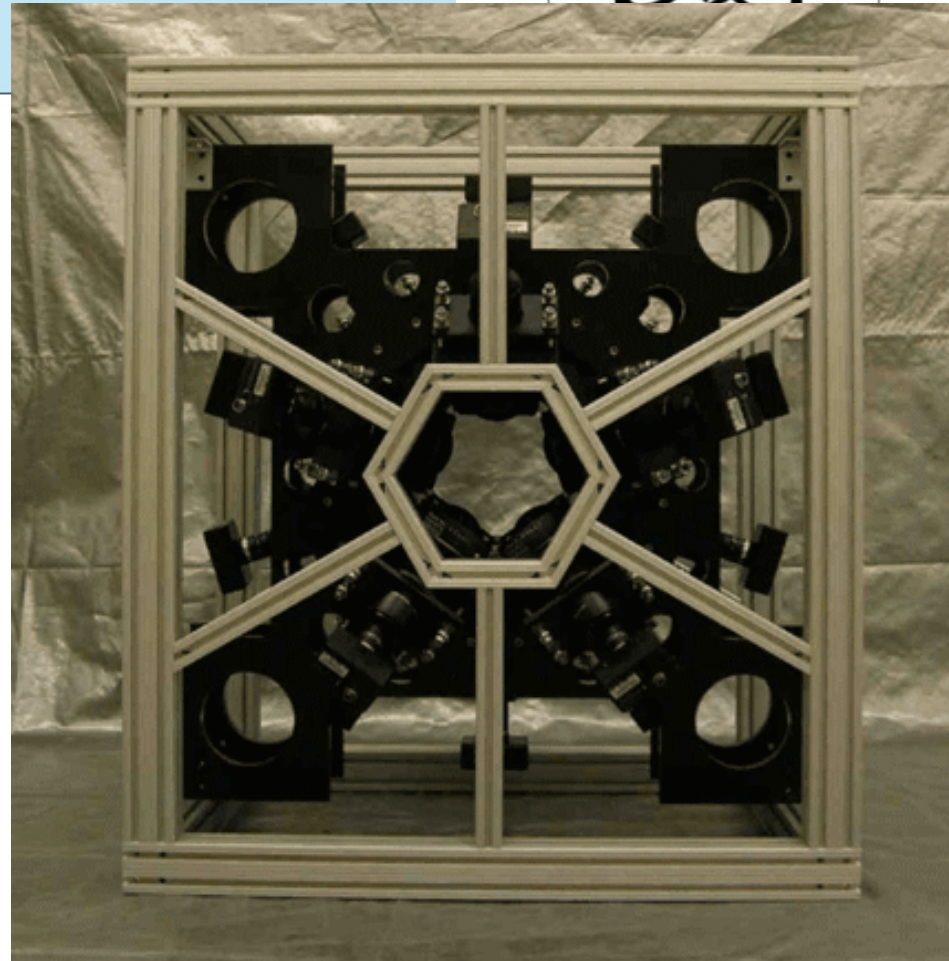
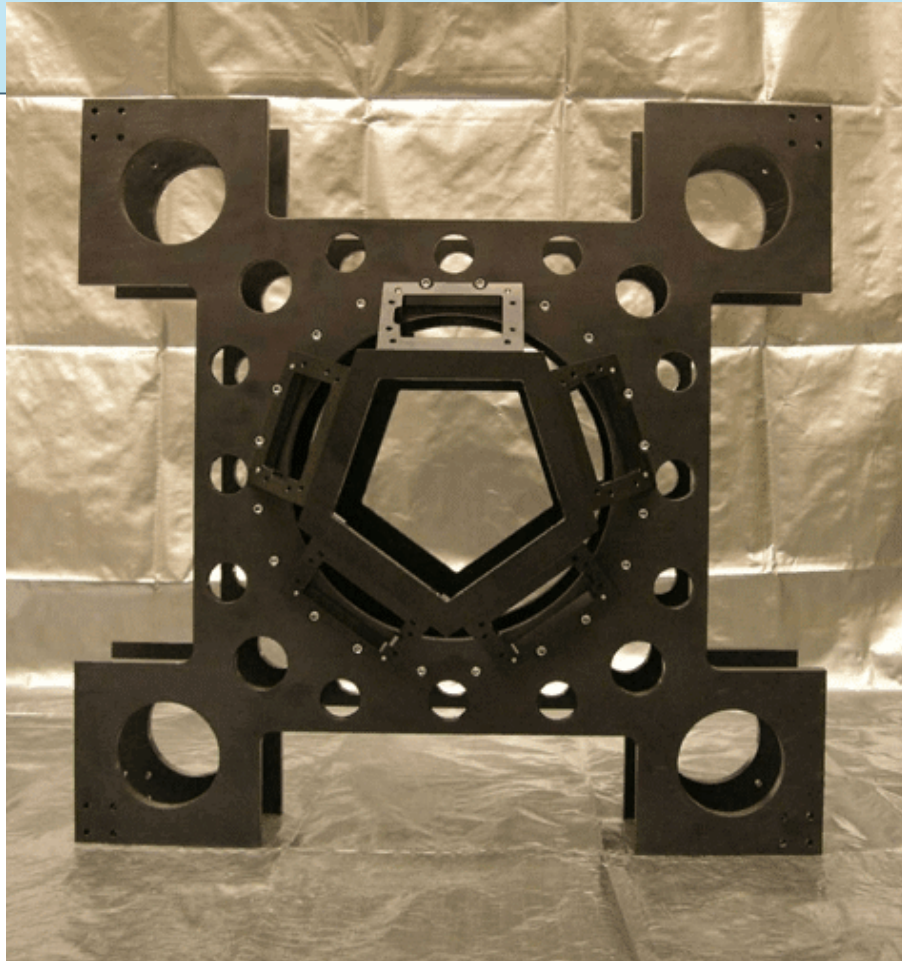
FastSPECT III – Final Design (2008)

61 cm



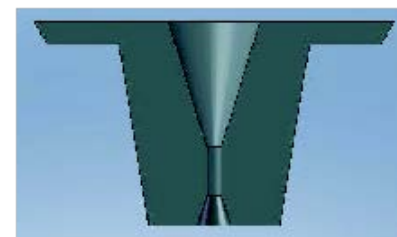
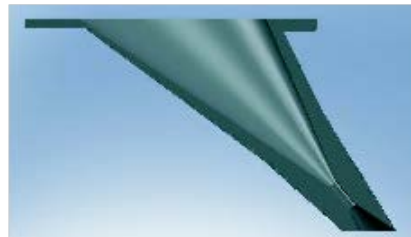
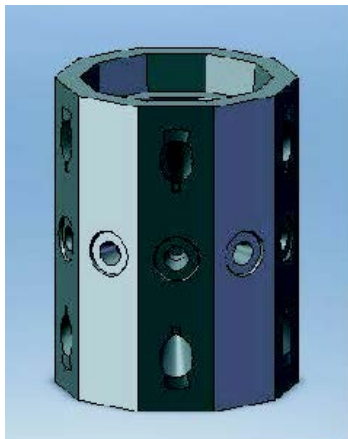
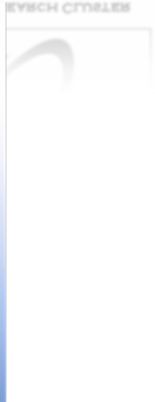
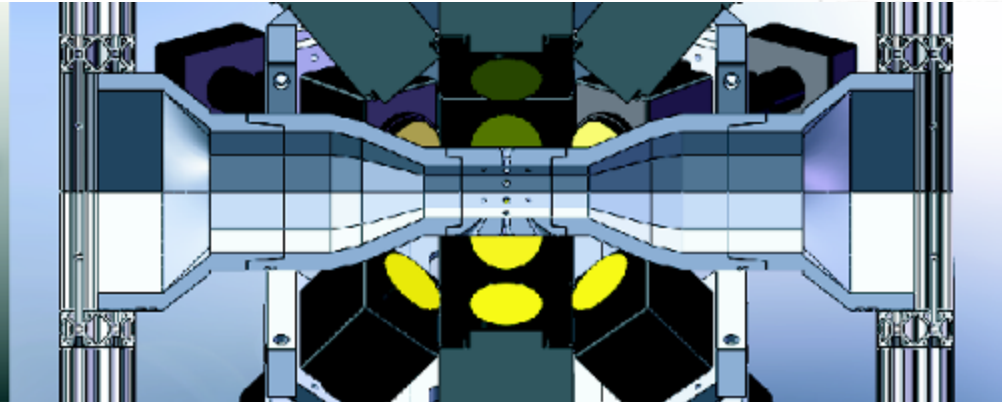
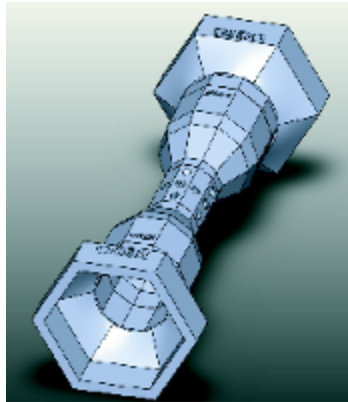


FastSPECT III (2008)



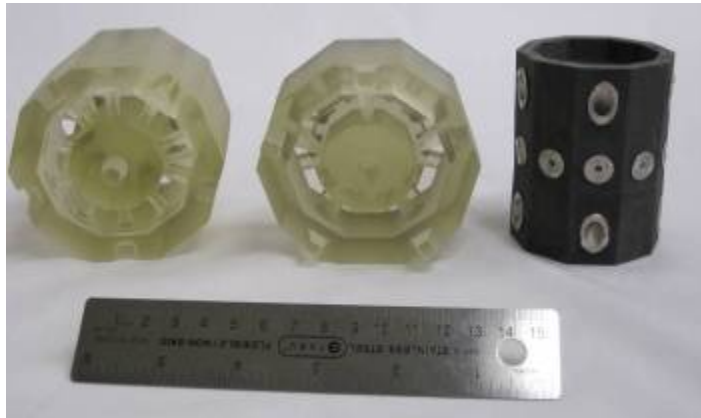


FastSPECT III Aperture Design using Rapid Prototyping



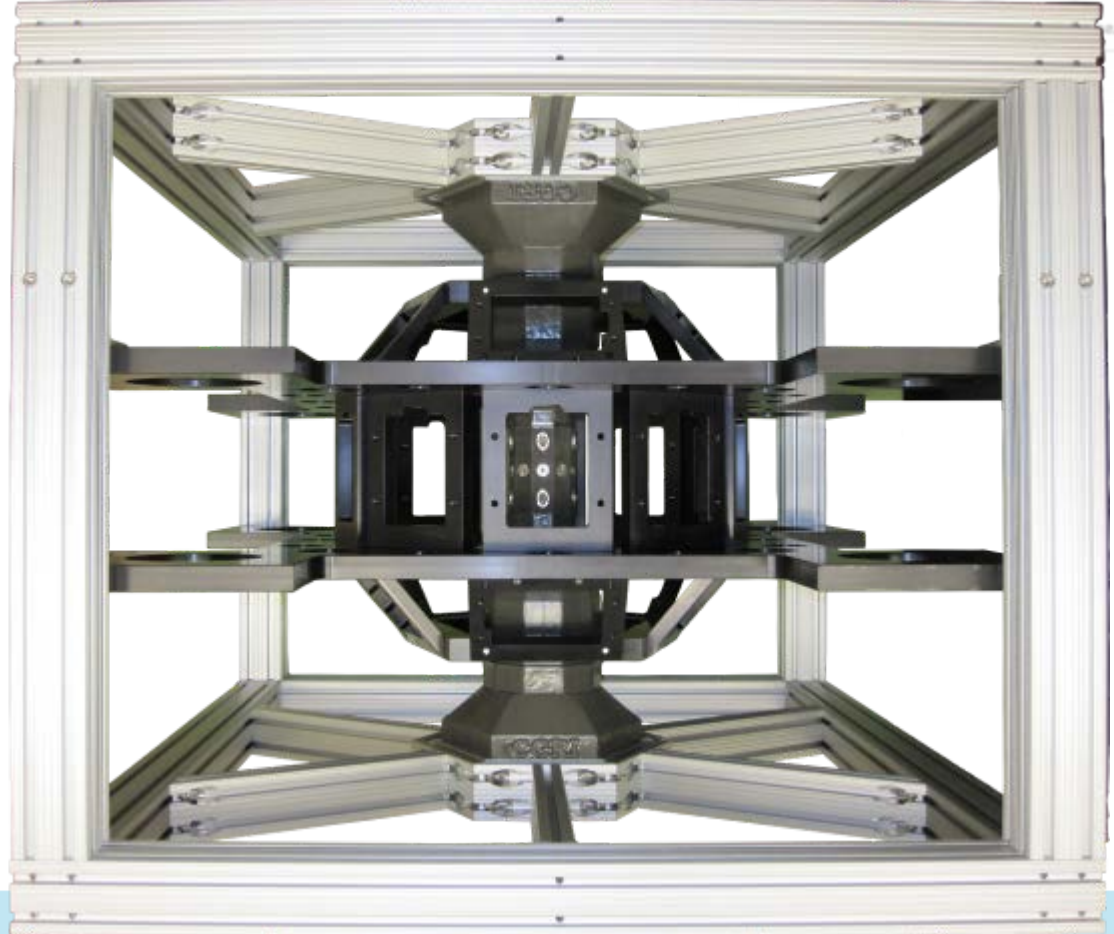
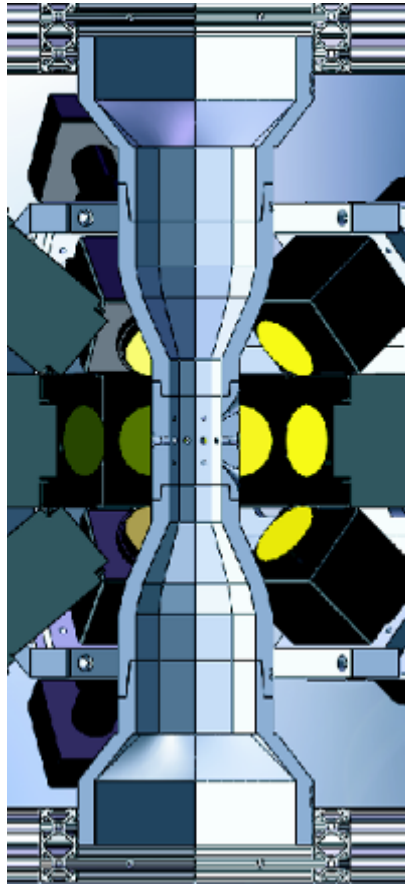


FastSPECT III Imaging Aperture





FastSPECT III Imaging Aperture



Short Term vs Long Term Radon Detectors A Comparative Study

86

Rn

Radon

(222.0176)



Radiological Protection Institute of Ireland

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OÉ Gaillimh
NUI Galway



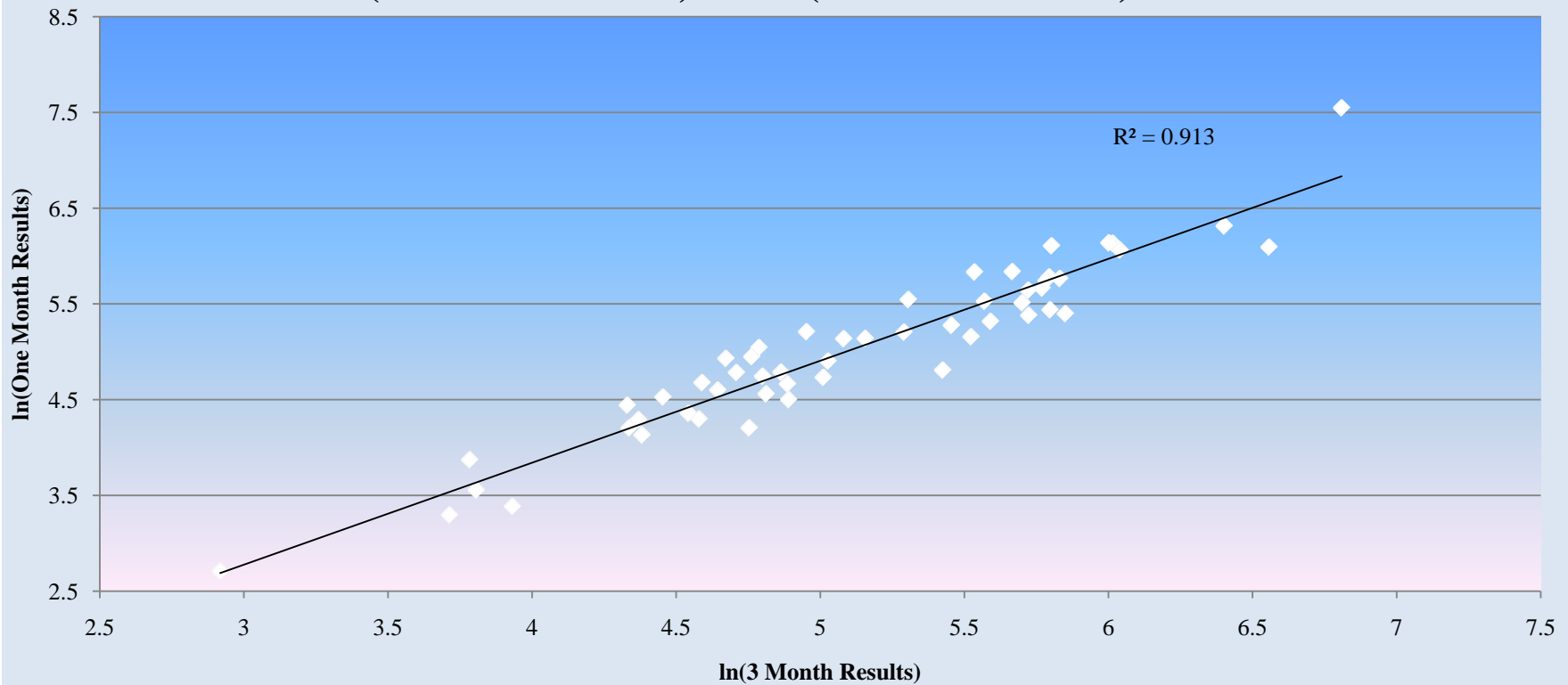


Residential Study Results

- One Month Average over entire survey
 - 230 Bq/m³
- Three Month Average over entire survey
 - 247 Bq/m³
- **44.4% of houses above 200 Bq/m³ (42.6% of homes high in both 1 and 3 month tests)**



Ln(3 Month Results) vs Ln(1 Month Results)



Awareness Campaign

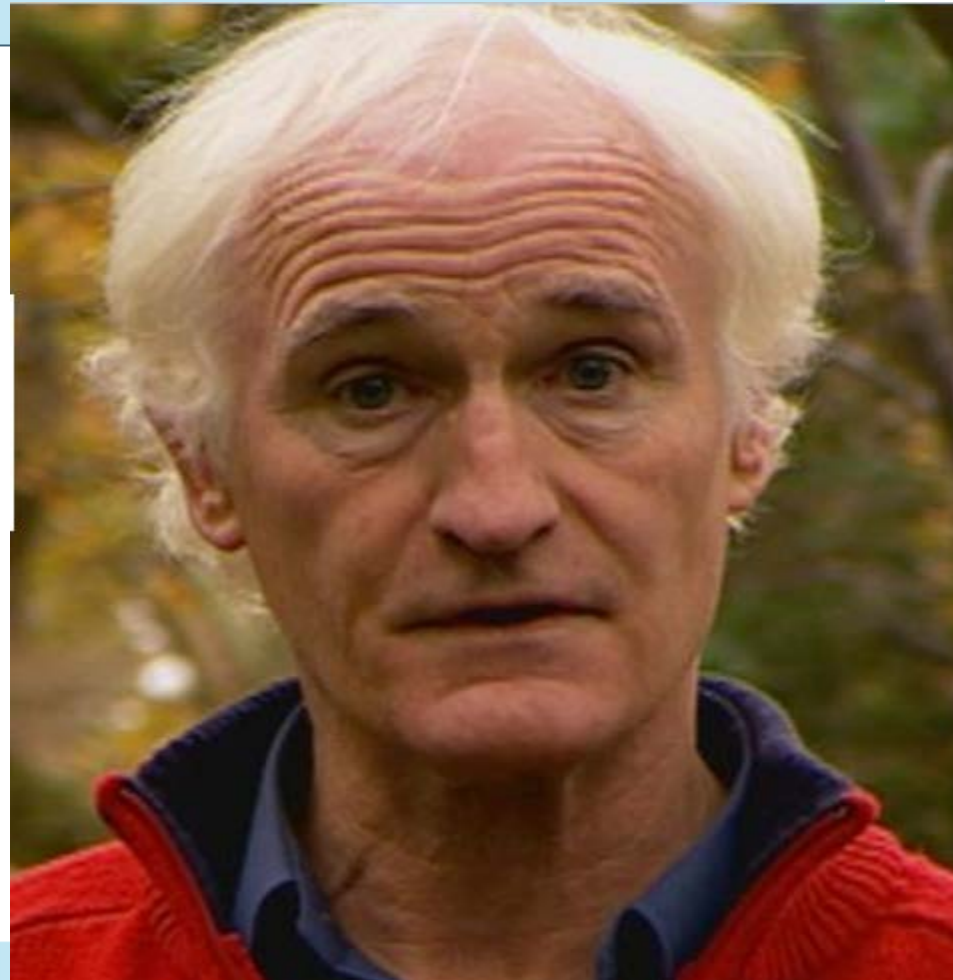
RTE's EcoEye With Duncan Stewart



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MEDICAL PHYSICS RESEARCH CLUSTER

RTE



NUI Galway
OÉ Gaillimh

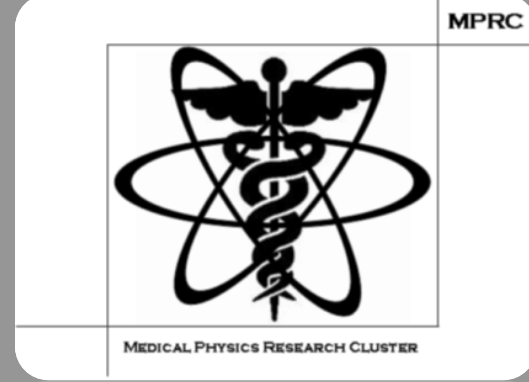


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