HelmholtzZentrum münchen
German Research Center for Environmental Health

The Heraeus Physics School and EURADOS Training Activities

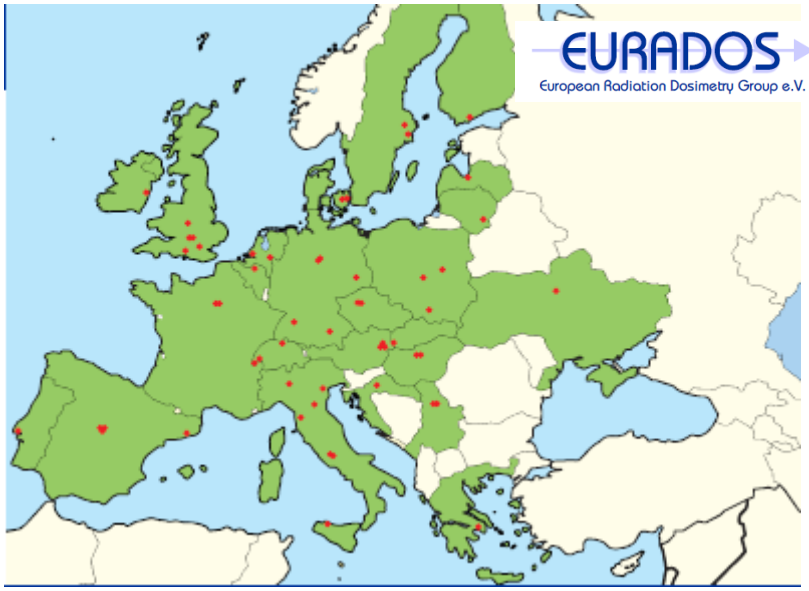
MELODI Workshop

September 11th, 2012

W. Rühm
Institute for Radiation Protection
Helmholtz Zentrum München
German Research Center for Environmental Health

HELMHOLTZ ASSOCIATION

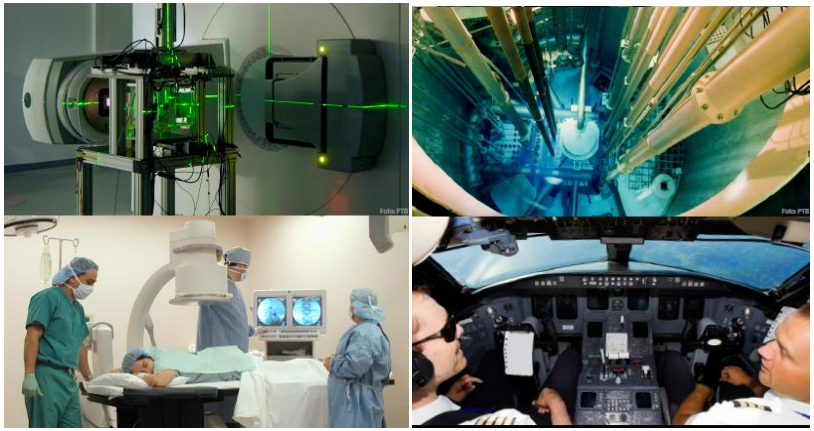
The European Radiation Dosimetry Group - EURADOS



- Self-sustainable network of more than 50 European institutions

- Executive Board (PTB, ENEA, ITN, SCK-CEN)
- Council (PTB, ENEA, ITN, SCK-CEN, IRSN, USP, CIEMAT, RBI, IFJ, HMGU, SL, HPA)
- Main bodies:
  General Assembly, Executive Board, Council, Working Groups

- Major activities:
  - Coordination of working groups
  - Organisation of scientific meetings
  - **Organisation of training activities**
  - Organisation of intercomparison studies



EURADOS Working Groups	WG Chairperson
WG2 – Harmonisation of Individual Monitoring	J. Alves, ITN, Portugal
WG3 – Environmental Dosimetry	S.Neumaier , PTB, Germany
WG6 – Computational Dosimetry	R. Tanner, HPA, UK
WG7 – Internal Dosimetry	M.A. Lopez, CIEMAT, Spain
WG9 – Radiation Protection Dosimetry in Medicine	R. Harrison, Newcastle, UK
WG10 – Retrospective Dosimetry	P. Fattibene, ISS, Italy
WG11 – High Energy Radiation Fields	W. Rühm, HMGU, Germany
WG12 – European Medical ALARA Network	F. Vanhavere, SCK-CEN, Belgium

EURADOS Winter Schools (during Annual Meetings)

- Radiation Protection for Medical Staff (AM2011, Prague)
- Radiological Emergencies – Internal exposures (AM2010, Rome)
- Low-Dose Radiation Effects (AM2009, Braunschweig)
- Retrospective Dosimetry (AM2008, Paris)
- Uncertainties in Radiation Dosimetry (AM2007, Oxford)

3rd EURADOS Winter School "Low-Dose Radiation Effects"

Wednesday, 28 January 2009

Time	Speaker	Topic (provisional title)
	Radiobiology	
09:00 - 09:40	D. Harder (DE)	Introduction to low-dose biological radiation effects
09:40 - 10:10	S. Salomaa (STUK, FI)	Areas of research in low-dose radiobiology
10:10 - 10:40		*coffee break*
	Epidemiology	
10:40 - 11:20	H. Zeeb (IMBEI, DE)	Introduction to epidemiology
11:20 - 11:50	W. Zhang (HPA, UK)	Studies on atomic bomb survivors - cancer and non-cancer diseases
11:50 - 12:20	M. Timarche (IRSN, FR)	Lung cancer after radon exposure - uranium miners and general population
12:20 - 13:30		*lunch*
13:30 - 14:00	P. Jacob (HMGU, DE)	Moderate dose and low dose rate exposures - epidemiological studies on occupational and environmental exposures
14:00 - 14:30	R. Shore (RERF, Japan)	Recent cataract studies
	Implementation	
14:30 - 15:00	W.U. Müller (UKE, DE)	Implications for radiation protection regulations

Symposia & Workshops (during Annual Meetings)

- Dosimetry for second cancer risk estimation in radiotherapy (AM2012)
- Accelerator radiation protection and shielding (AM2010)
- Cosmic Radiation and Aircrew Exposure (AM2009)
- Dosimetric Issues in the Medical Use of Ionizing Radiation (AM2008)
- Characterization of Workplaces for the Assessment of the Doses to Individuals (AM2007)
- Uncertainties in Dosimetry - Principles Through to Practice (AM2006)
- Radiation Protection Dosimetry and Dosimetry for Medical Applications (AM2005)
- Biological and Physical Dosimetry for Radiation Protection (AM2004)

SEIBERSDORF LABORATORIES

EURADOS
European Radiation Dosimetry Group e. V.

IAEA.org
International Atomic Energy Agency

Workshop "Dosimetry for second cancer risk estimation in radiotherapy"

8 February 2012

EURADOS WG 9

Measurement of out-of-field doses in radiotherapy and the estimation of second cancer risks

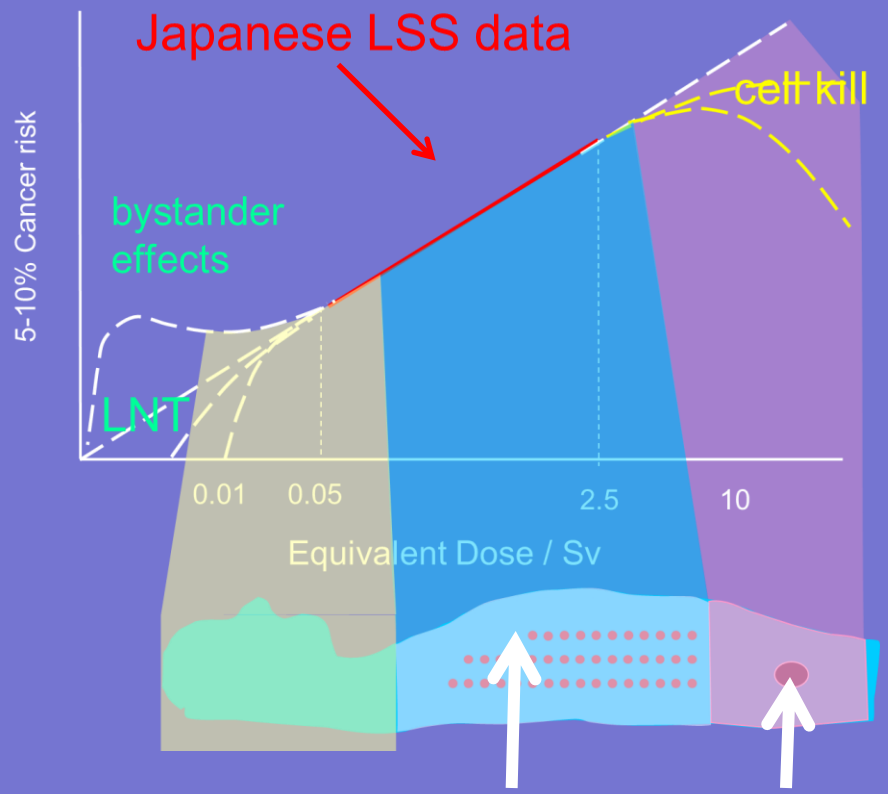


Figure adapted from Hall 2008

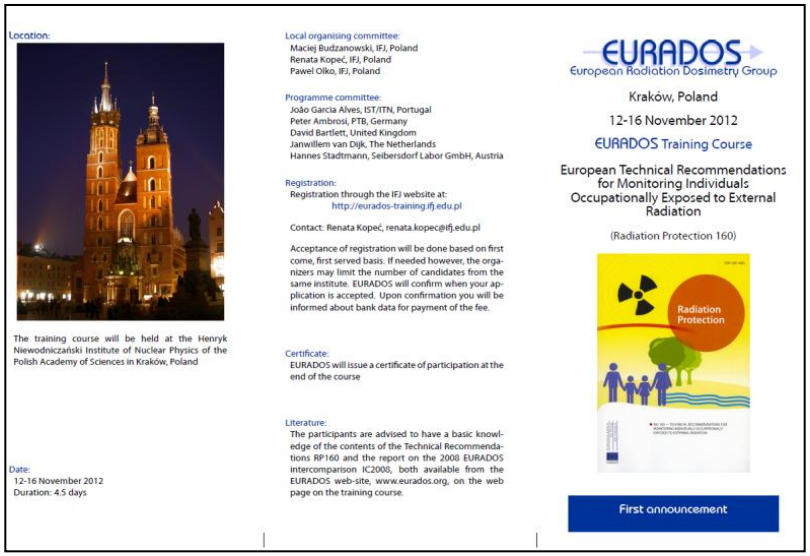
- Radiotherapy: Doses range from a few mGy to tens of Gy
- Risk estimates require up-to-date knowledge of the dose-risk function
- across the entire dose range
- underpinned by rigorous dosimetry
- Contact WG9 Chair: roger.m.harrison@gmail.com

EURADOS Training Courses

- European Recommendations for Monitoring Individuals, Kraków, 12-16 November 2012
- School on Retrospective Dosimetry, Neuherberg, 22-26 October 2012
- Voxel Phantom School, Fontenay-aux-Roses, 11-13 October, 2011
- Advanced Methods for Internal Dose Assessment, Prague, 2-6 February, 2009
- Unfolding Training Course, Cape Town, 7-8 April, 2006

WG10 – Retrospective Dosimetry

WG2 – Harmonisation



WG7 - Internal Dosimetry

EURADOS/IAEA
Regional Training Course on
Advanced Methods
for Internal Dose Assessment

Application of IDEAS Guidelines and dissemination of CONRAD internal dosimetry results

WORKBOOK of case descriptions

Czech Technical University in Prague (Czech Republic)
Prague
2nd to 6th February 2009

- Theoretical lectures, examples, exercises, demonstration of available software tools
- Achievements of Work Package 5 “Coordination of Research on Internal Dosimetry” of CONRAD Project (VI FP, EURATOM)
- Organizers
  - EURADOS WG7, IAEA, Czech TU in Prague

The Wilhem and Else Heraeus Foundation

- Founded in 1963 by Wilhelm Heraeus (1900-1985)
- Since 1975 close cooperation with German Physical Societey
- Most important private German institution funding physics
- Office, Managing Director, Scientific Advisory Board, Board of Directors

- **Organisation of Scientific Seminars (30,000 participants since 1989)**
  Workshop-type meetings to allow for scientific exchange
- **Organisation of Physics Schools (12,000 participants since 1989)**
  On emerging fields in physics not yet covered in textbooks (master+PhD students, postdocs)
- **Student Travel Grants (21,000 grants since 1989) -** For DPG Spring Meetings
- **Promotion of Students** - School projects, donation to schools, student's labs, museums, …
- **Promotion of Physics Teachers** - Teacher's education, cooperation schools and universities

Venue - The Physikzentrum Bad Honnef

1897 - Merchant Otto Hölterhoff established the "Elly Hölterhoff-Böcking-Foundation".

1906 – 1940: Home for young ladies being teachers of a household school.

1947 - 1976: Home for senior citizens and used for special purposes of the University of Bonn

Since 1976: Summer school center, run by the German Physical Society (DPG) and supported by the State North Rhine-Westphalia and the University of Bonn.

- Summer Schools on advanced topics of modern physics
- Advanced training of school teachers in physics
- Research seminars on new developmens in special fields of physics
- Contact seminars on professional problems of specific groups of physicists

Lecture hall – large (100 seats)

Medium-sized (40 seats)

+ **seminar rooms**, also with modern equipment (beamer, internet, …)

Rooms for participants

Historical atmosphere

WE-Heraeus Physics School
"Ionising Radiation and Protection of Man and Environment"

- Organised since 2005
  (initiated by H. Paretzke, HMGU, Germany)
- Venue: Physik Zentrum Bad Honnef, Germany

Concept

- About 10-12 days
- About 72 lecture units (45 minutes each)
- Exercises (measurements, simulations)
- Poster sessions and poster prize

- **First Year**: *Physics School* in Radiation Protection
  Basics in radiation physics, radiation biology, radiation protection, radioecology, radiation epidemiology, radiation in medicine, …

- **Second Year**: *Advanced Physics School* in RP
  Lessons learned in the first year are applied by discussion of special topics

- Last years: about 50 participants, 20 lecturers

- All lived at the Physik Zentrum, to stimulate discussions and promote networking

- Costs: 150 Euro per participant

- Target group:
  Students, Graduates, PhD-students, Postdocs

Programme 2012 – *Advanced* Physics School, 10.–19. August 2012

- Organisors: Rühm, Michel, Iliakis; Consultant: Paretzke
- http://iss-kurse.helmholtz-muenchen.de/heraeus-school/

- 45 participants from 15 countries
- 21 lecturers from 7 countries

- Topics of this year
  - Refresher on Ionising Radiation
  - Radiation Transport, Track Structure
  - Radiation Systems Biology
  - Fukushima Accident

- Introduction of participants (6 units)
- Poster session (2 units)
- Exercises with PENELOPE on own PC

- Video conference with IAEA (new)

Introduction

Friday, 10. August 2012

9:00	Welcome, The Wilhelm and Else Heraeus-Stiftung, the Physics School, Concepts in Radiation Protection	**Rühm**
9:45	Basics in Nuclear Physics	**Rühm**
10:30	Coffee Break	
11:00	Interaction of Ionising Radiation with Matter 1	**Rühm, HMGU**
11:45	Interaction of Ionising Radiation with Matter 2	**Rühm, HMGU**
12:30	Lunch Break	
14:00	Biological Effects of Ionising Radiation 1	**Rühm, HMGU**
14:45	Biological Effects of Ionising Radiation 2	**Rühm, HMGU**
15:30	Coffee Break	
16:00	Introduction of Participants and their Work 1	
16:45	Introduction of Participants and their Work 2	
17:30	End of lectures	
18:00	Heraeus Dinner and Social Evening	

Focus Issue 1: Radiation Transport and Track Structure Simulation

Saturday, 11. August 2012

9:00	Radiation transport. Fundamental quantities	**Salvat, Spain**
9:45	Radiation transport: Multiple scattering theories	**Salvat, Spain**
10:30	Coffee Break	
11:00	Monte Carlo (MC) simulation: Detailed schemes and geometries	**Salvat, Spain**
11:45	MC simulation: Condensed-history methods for charged particles	**Salvat, Spain**
12:30	Lunch Break	
14:00	Available Radiation Transport Codes 1	**Gargioni, UKE**
14:45	Available Radiation Transport Codes 2	**Gargioni, UKE**
15:30	Coffee Break	
16:00	Introduction of Participants and their Work 3	
16:45	Introduction of Participants and their Work 4	
17:30	End of Lectures	
18:00	Dinner	
20:00	Introduction of Participants and their Work 5 (optional)	
20:45	Introduction of Participants and their Work 6 (optional)	

Thank You!