

COLLEGE ON MEDICAL PHYSICS

(30 August - 22 September 2004)

Miramare - Trieste, Italy

Directors: A. Benini, P. Sprawls and S. Tabakov
Local Organizer: L. Bertocchi

FINAL PROGRAMME

(all lectures were held in the Giambiagi Lecture Hall, Adriatico Guest House)

WEEK 1

MONDAY, 30 AUG 2004

- 08:30 - 09:30 **REGISTRATION** - Adriatico Guest House, lower level 1
(subsequently in Office No. 3)
- 09:30 - 10.00 **OPENING SESSION** - Organizers
- 10:00 - 11.00 Learning and teaching medical physics
Perry SPRAWLS (Emory Univ., Georgia, Atlanta,.)
- 11:00 - 11.30 COFFEE BREAK
- 11:30 - 12.30 Medical image characteristics and quality factors
Perry SPRAWLS (Emory Univ., Georgia, Atlanta,.)
PPMI, Ch. 1
- 12:30 - 14.00 LUNCH
- 14:00 - 15.00 Overview of Radiation protection in Diagnostic Radiology
Anna BENINI (University Hospital (RH) Copenhagen, Denmark)
- 15:00 - 15:30 COFFEE BREAK
- 15:30 - 16.30 Biological Effect
Anna BENINI (University Hospital (RH) Copenhagen, Denmark)

TUESDAY, 31 AUG

- 09:00 - 10.00 Interactions of radiation with matter-imaging considerations
Perry SPRAWLS (Emory Univ., Georgia, Atlanta,.)
PPMI, Ch. 10, 11
- 10:00 - 11.00 X-ray image formation and contrast
Perry SPRAWLS (Emory Univ., Georgia, Atlanta)
PPMI, Ch. 12
- 11:00 - 11.30 COFFEE BREAK
- 11:30 - 12.30 International System of Radiation Protection and Regulatory Requirements
Anna BENINI (University Hospital (RH) Copenhagen, Denmark)
- 12:30 - 14.00 LUNCH
- 14:00 - 15.00 X-ray tubes and generators
Slavik TABAKOV (Kings College, London, U.K.)
- 15:00 - 15:30 COFFEE BREAK
- 15:30 - 16.30 Evaluating generator performance
Slavik TABAKOV (Kings College, London, U.K.)

WEDNESDAY, 1 SEP

- 09:00 - 10.00 Image blurring, visibility of detail and resolution
Perry SPRAWLS (Emory Univ., Georgia, Atlanta,) PPMI, Ch. 18
- 10:00 - 11.00 Image noise
Perry SPRAWLS (Emory Univ., Georgia, Atlanta,) PPMI, Ch. 21
- 11:00 - 11.30 COFFEE BREAK
- 11:30 - 12.30 Film screen radiographic receptors
Perry SPRAWLS (Emory Univ., Georgia, Atlanta,.) PPMI, Ch. 14, 15
- 12:30 - 14.00 LUNCH
- 14:00 - 15.00 Fluoroscopic imaging systems
Slavik TABAKOV (Kings College, London, U.K.)
- 15:00 - 15:30 COFFEE BREAK
- 15:30 - 16.30 Fluoroscopic image quality
Slavik TABAKOV (Kings College, London, U.K.)

THURSDAY, 2 SEP

- 09:00 - 10.00 Film contrast characteristics
Perry SPRAWLS (Emory Univ., Georgia, Atlanta, PPMI, Ch. 16
- 10:00 - 11.00 Medical Exposures, UN Basic Safety Standard
Anna BENINI (University Hospital (RH) Copenhagen DK
- 11:00 - 11.30 COFFEE BREAK
- 11:30 - 12.30 Practical calculation of shielding
Anna BENINI (University Hospital (RH) Copenhagen, Denmark
- 12:30 - 14.00 LUNCH
- 14:00 - 15.00 Organization and effectiveness of QC
Slavik TABAKOV (Kings College, London, U.K.)
- 15:00 - 15:30 COFFEE BREAK
- 15:30 - 16.30 Organization of acceptance testing of X-ray equipment
Slavik TABAKOV (Kings College, London, U.K.)

FRIDAY, 3 SEP

- 09:00 - 10.00 Radiographic detail
Perry SPRAWLS (Emory Univ., Georgia, Atlanta)
PPMI, Ch. 19
- 10:00 - 11:00 Digital image characteristics and structure
Perry SPRAWLS (Emory Univ., Georgia, Atlanta)
PPMI online, <http://www.sprawls.org/resources>
- 11:00 - 11.30 COFFEE BREAK
- 11:30 - 12.30 Radiographic density control
Slavik TABAKOV (Kings College, London, U.K.)
- 12:30 - 14.00 LUNCH
- 14:00 - 15.00 Basics of computed radiography
Slavik TABAKOV (Kings College, London, U.K.)
- 15:00 - 15:30 COFFEE BREAK
- 15:30 - 16.30 Computed tomography image formation
Slavik TABAKOV (Kings College, London, U.K.)

WEEK 2

MONDAY, 6 SEP

- 09:00 - 10.00 Radiation protection audit
Cornelius (Neil) LEWIS (Kings College, London, U.K.)
- 10:00 - 11.00 Medical exposure directive
Cornelius (Neil) LEWIS (Kings College, London, U.K.)
- 11:00 - 11.30 COFFEE BREAK
- 11:30 - 12.30 Computed tomography QC
Slavik TABAKOV (Kings College, London, U.K.)
- 12:30 - 14.00 LUNCH
- 14:00 - 15.00 CR and DDR systems
Slavik TABAKOV (Kings College, London, U.K.)
- 15:00 - 15:30 COFFEE BREAK
- 15:30 - 17.30 **COMPUTER SESSION** - Informatic Laboratory
(Simulation contrast/detail meas)
Slavik TABAKOV+Neil Lewis (Kings College, London, U.K.)

TUESDAY, 7 SEP

- 09:00 - 10.00 Implementation of a radiation protection programme 1
Cornelius (Neil) LEWIS (Kings College, London, U.K.)
- 10:00 - 11.00 Implementation of a radiation protection programme 2
Cornelius (Neil) LEWIS (Kings College, London, U.K.)
- 11:00 - 11.30 COFFEE BREAK
- 11:30 - 12.30 Digital image processing
Perry SPRAWLS (Emory Univ., Georgia, Atlanta, U.S.A.)
PPMI online, <http://www.sprawls.org/resources>
- 12:30 - 14.00 LUNCH
- 14:00 - 15.00 Scattered radiation and contrast
Perry SPRAWLS (Emory Univ., Georgia, Atlanta,)
PPMI, Ch. 13
- 15:00 - 15:30 COFFEE BREAK
- 15:30 - 16.30 Individual Monitoring, and Exposure Assessment
Anna BENINI (University Hospital (RH) Copenhagen, Denmark)
- 18:00 - RECEPTION - ADRIATICO TERRACE

WEDNESDAY, 8 SEP

- 09.00 - 10.00 Digital image transmission and storage
Perry SPRAWLS (Emory Univ., Georgia, Atlanta, U.S.A.)
PPMI online, <http://www.sprawls.org/resources>
- 10.00 - 11.00 Re-engineering the medical physics education process
Perry SPRAWLS (Emory Univ., Georgia, Atlanta, U.S.A.)
- 11.00 - 11.30 COFFEE BREAK
- 11.30 - 12.30 Medical physics training resources - EMERALD and EMIT
Slavik TABAKOV (Kings College, London, U.K.)
- 12.30 - 14.00 LUNCH
- 14.00 - 15.00 Feedback and discussion of posters & Poster Session
Slavik TABAKOV (Kings College, London, U.K.)
Perry SPRAWLS (Emory Univ., Georgia, Atlanta, U.S.A.)
- 15:00 - 15:30 COFFEE BREAK
- 15.30 - 16.30 **COMPUTER SESSION** - Informatic Laboratory
(Use of EMERALD)
Slavik TABAKOV (Kings College, London, U.K.)

THURSDAY, 9 SEP

- 09.00 - 10.00 Ultrasound characteristics, production and interactions
Perry SPRAWLS (Emory Univ., Georgia, Atlanta, U.S.A.)
PPMI, Ch. 25
- 10.00 - 11.00 Ultrasound imaging
Perry SPRAWLS (Emory Univ., Georgia, Atlanta, U.S.A.)
PPMI, Ch. 26
- 11.00 - 11.30 COFFEE BREAK
- 11.30 - 12.30 Ultrasound vascular imaging
Perry SPRAWLS (Emory Univ., Georgia, Atlanta, U.S.A.)
PPMI, Ch. 27
- 12.30 - 14.00 LUNCH
- 14.00 - 15.00 Inspections, design and shielding in Diagnostic Radiology
Anna BENINI (University Hospital (RH) Copenhagen, Denmark)
- 15:00 - 15:30 COFFEE BREAK
- 15.30 - 16.30 Safety of Sources and design of shielding facilities
Anna BENINI ((University Hospital (RH) Copenhagen, Denmark)

FRIDAY, 10 SEP

- 09.00 - 10.00 Measurement of radioactivity, calibrations and counting
statistics
Franco MILANO (Universita' degli Studi di Firenze, Italy)
- 10.00 - 11.00 Radiation measurement calibrations
Franco MILANO (Universita' degli Studi di Firenze, Italy)
- 11.00 - 11.30 COFFEE BREAK
- 11.30 - 12.30 Equipment Design and acceptable Safety Standards.
Anna BENINI (University Hospital (RH) Copenhagen, Denmark)
- 12.30 - 14.00 LUNCH
- 14.00 - 15.00 Examples of radiation protection in interventional radiology
Anna BENINI (University Hospital (RH) Copenhagen, Denmark)
- 15:00 - 15:30 COFFEE BREAK
- 15:30 - 16.30 Occupational exposure, individual monitoring, including emergency
and local rules
Anna BENINI (University Hospital (RH) Copenhagen, Denmark)

WEEK 3

MONDAY, 13 SEP

- 09.00 - 10.00 Magnetic resonance image characteristics and NMR
Perry SPRAWLS (Emory Univ., Georgia, Atlanta, U.S.A.)
MRI, Ch. 1 & 3
- 10.00 - 11.00 MRI system components
Perry SPRAWLS (Emory Univ., Georgia, Atlanta, U.S.A.)
MRI, Ch. 2
- 11.00 - 11.30 COFFEE BREAK
- 11.30 - 12.30 Characteristics of radionuclides for imaging
Donald FREY (Medical University of South Carolina, Charleston, U.S.A.)
- 12.30 - 14.00 LUNCH
- 14.00 - 15.00 Radiation detectors and measurement
Donald FREY (Medical University of South Carolina, Charleston, U.S.A.)
- 15.00 - 15.30 COFFEE BREAK
- 15.30 - 16.30 Gamma camera function and imaging
Donald FREY (Medical University of South Carolina, Charleston, U.S.A.)

TUESDAY, 14 SEP

- 09.00 - 10.00 Gamma camera image quality characteristics
Donald FREY (Medical University of South Carolina, Charleston, U.S.A.)
- 10.00 - 11.00 Evaluating gamma camera performance and quality control
Donald FREY (Medical University of South Carolina, Charleston, U.S.A.)
- 11.00 - 11.30 COFFEE BREAK
- 11.30 - 12.30 Radionuclide dose considerations
Donald FREY (Medical University of South Carolina, Charleston, U.S.A.)
- 12.30 - 14.00 LUNCH
- 14.00 - 15.00 Radiation protection in nuclear medicine - Part I
Anna BENINI (University Hospital (RH) Copenhagen, Denmark)
- 15.00 - 15.30 COFFEE BREAK
- 15.30 - 16.30 Results of CT quality control in Trieste
Mario DE DENARO (Medical Physics Department, Trieste)

WEDNESDAY, 15 SEP

- 09.00 - 10.00 Tissue magnetization and relaxation
Perry SPRAWLS (Emory Univ., Georgia, Atlanta, U.S.A.)
MRI, Ch. 4
- 10.00 - 11.00 The MR imaging process
Perry SPRAWLS (Emory Univ., Georgia, Atlanta, U.S.A.)
MRI, Ch. 5
- 11.00 - 11.30 COFFEE BREAK
- 11.30 - 12.30 Radiation protection in nuclear physics - Part II
Anna BENINI (University Hospital (RH) Copenhagen, Denmark)
- 12.30 - 14.00 LUNCH
- 14.00 - 15.00 Patient Radiation Protection, practical rules, procedures
Anna BENINI (University Hospital (RH) Copenhagen, Denmark)
- 15.00 - VISIT TO SINCROTRONE, TRIESTE

THURSDAY, 16 SEP

- 09.00 - 10.00 Radionuclide tomographic imaging (SPECT)
Donald FREY (Medical University of South Carolina, Charleston, U.S.A.)
- 10.00 - 11.00 Radionuclide tomographic imaging (PET)
Donald FREY (Medical University of South Carolina, Charleston, U.S.A.)
- 11.00 - 11.30 COFFEE BREAK
- 11.30 - 12.30 Radionuclide Imaging
Donald FREY (Medical University of South Carolina, Charleston, U.S.A.)
- 12.30 - 14.00 LUNCH
- 14.00 - 15.00 **COMPUTER SESSION** – Inf. Lab. (EMIT MRI Simulation)
Franco MILANO (Universita' degli Studi di Firenze, Italy)
- 15.00 - 15:30 COFFEE BREAK
- 15.30 - 16.30 Quality control of CR systems - Results from Trieste
Paola BREGANT (Medical Physics Department, Trieste)

FRIDAY, 17 SEP

- 09.00 - 10.00 Nuclear medicine data processing
Donald FREY (Medical University of South Carolina, Charleston, U.S.A.)
- 10.00 - 11.00 Presentation of some examples of patients dose measurements programmes
Anna BENINI (University Hospital (RH) Copenhagen, Denmark)
- 11.00 - 11.30 COFFEE BREAK
- 11.30 - 12.30 Mammography
Franco MILANO (Universita' degli Studi di Firenze, Italy)
- 12.30 - 14.00 LUNCH
- 14.00 - 15.00 Mammography QC
Franco MILANO (Universita' degli Studi di Firenze, Italy)
- 15:00 - 15:30 COFFEE BREAK
- 15.30 - 16.30 Mammography QC results
Franco MILANO (Universita' degli Studi di Firenze, Italy)

WEEK 4 20 - 22 September 2002

MONDAY, 20 SEP

- 09.00 - 10.00 MR imaging methods
Perry SPRAWLS (Emory Univ., Georgia, Atlanta, U.S.A.)
MRI, Ch. 6 & 7
- 10.00 - 11.00 Selective signal suppression
Perry SPRAWLS (Emory Univ., Georgia, Atlanta, U.S.A.)
MRI, Ch. 8
- 11.00 - 11.30 COFFEE BREAK
- 11.30 - 12.30 Practical implementation of QA-QC programmes, part 1: principles
Anna BENINI (University Hospital (RH) Copenhagen, Denmark)
- 12.30 - 14.00 LUNCH
- 14.00 - 15.00 Practical implementation of QA-QC programmes, part 2: examples
Anna BENINI (University Hospital (RH) Copenhagen, Denmark)
- 15:00 - 15:30 COFFEE BREAK
- 15.30 - 18:00 Practical Work at Ospedale Maggiore, Trieste
A. BENINI, M. De Denaro, P. Bregant, R. Vidimari.

