

Operation and Exploitation of the Reactor, Dosimetry (RPI) and Reactor Calculations

Lectures given by ITN staff

- N.P. BARRADAS. Ion implantation. *XIX Autumn School, Instituto Superior Técnico*, Lisbon, October 2001.
- N.P. BARRADAS. Guest in TV program "Hora Viva" in channel RTP2, on the subject "Young Scientists in Portugal", May 2001
- I.C. GONÇALVES, A. P. FERNANDES. Dosimetria por Termoluminescência em campos mistos de fótons e neutrões. *Physics Eng.Master - Faculty of Sciences/ITN, ITN*, 26 Jan. 2001.
- I.C. GONÇALVES. O Reactor Português de Investigação-Como é? Para que serve? *Faculty of Pharmacy-Radiopharmacy option, ITN*, May 2001.
- I.C. GONÇALVES, A. FERNANDES, N. OLIVEIRA. Use of the Portuguese Research Reactor in the field of BNCT. *XIX Autumn School, Instituto Superior Técnico*, Lisbon, October 2001.
- J.G. MARQUES. Solid State Physics at ISOLDE: The Lisbon Group. *XIX Autumn School, Instituto Superior Técnico*, Lisbon, October 2001.
- J.G. MARQUES. Current R&D Activities at the Portuguese Research Reactor. *XIX Autumn School, Instituto Superior Técnico*, Lisbon, October 2001.
- J.G. MARQUES. Actividades Correntes de Investigação e Desenvolvimento no Reactor Português de Investigação. *Centro de Física Nuclear da Universidade de Lisboa*, Lisbon, June 2001.
- J.G. MARQUES. Física no Reactor Português de Investigação. *Semana da Física, Instituto Superior Técnico*, Lisbon, October 2001.

Participation in Juries

- M.C. FREITAS, Member of the Jury of a Researcher thesis, ITN, Sacavém, 3 April 2001.
- M.C. FREITAS, Member of the Jury of a PhD thesis, *University of Azores*, Terceira island, 10 September 2001.
- M.C. FREITAS, Member of the Jury of a PhD thesis, Delft University of Technology, Delft, The Netherlands, 12 October 2001.
- J. ANTUNES, Member of the Jury of a PhD thesis, *Université Paris VI*, Paris, 26 October 2001.
- J. ANTUNES, Member of the Jury of a PhD thesis, *École Polytechnique*, Paris, 29 November 2001.

Department of Radiological Protection and Nuclear Safety

Courses Organised

ABACOS-2000, Whole Body Counting Software, Basic and Advanced Training, 28 May - 1 June, Sacavém, Portugal.

Course on Radiation Protection and Safety (PEGOP-ENERGIA ELÉCTRICA, S.A.) 20 April 2001, organized by DPRSN (Course Organization- M. B. Martins):

- M.B. MARTINS. Biological Effects of Ionizing Radiations.
- A. OLIVEIRA. Matter and Radiation
- A. OLIVEIRA. Radiation Dosimetry
- A. OLIVEIRA. Detection and Measurements of Ionising Radiations
- R. TRINDADE. Principles of Occupational Radiation Protection
- J. SEBASTIÃO. Emergencies and Intervention in Case of Accident

National Training Course on Radiation Protection in Industrial Radiography (19-23 November 2001), organized by DPRSN in co-operation with IAEA (Course Organization- F. P. Carvalho, M. B. Martins):

- M.B. MARTINS. Biological Effects of Ionizing Radiations.
- A. OLIVEIRA. Ionising Radiation. Interaction of Radiation with the substance
- R. TRINDADE. Portuguese Legislation for Radiation Protection in Industrial Radiography
- K. JACOB. Radiation Sources used in Industrial Radiography
- J. CARDOSO. Radiation Protection Quantities and Units
- J. SEBASTIÃO. Practical Lesson in a Radiographic Facility

National Training Course on Radiation Protection in Diagnostic and Interventional Radiology (10-14 December 2001) organized by DPRSN in co-operation with IAEA (Course Organization- F. P. Carvalho, M. B. Martins):

- J. ALVES. Occupational Exposure
- A. OLIVEIRA. Radiation Physics: Quantities and Units Relevant to Radiology.
- R. TRINDADE. Portuguese Legislation

Lectures given by DPRSN staff

- A F. CARVALHO. Radiation Protection in Dental Radiography. *Faculty of Dental Medicine*, Lisbon, 11 January 2001.

- A.D. OLIVEIRA. Controlo e Detecção da Radiação. *IV Course in radiation Protection, Sociedade Portuguesa de Protecção Contra Radiações*, Lisbon, 28 Nov 2001.
- A.D. OLIVEIRA. Dosimetria Física das Radiações. *IV Course in radiation Protection, Sociedade Portuguesa de Protecção Contra Radiações*, Lisbon, 28 Nov 2001.
- F. P. CARVALHO, The Use of Radioisotopes in Hospitals: Safe Handling and Waste Disposal. *LNEC*, Lisboa, 10 October; *Hospital dos Covões*, Coimbra, 17 October ; *Hospital Pedro Hispano*, Matosinhos, 24 October 2001.
- F. P. CARVALHO, Ionising Radiation, Environment and Man. *Instituto de Altos Estudos Militares*, Lisboa, 15 November 2001.
- F. P. CARVALHO, The Uranium Mining in Portugal and Radioactive Contamination of the Environment, *Faculty of Sciences*, Lisbon, 20 November 2001.
- F. P. CARVALHO, Environmental Radioactivity and Water Quality. *Seminar organized by APIAM*, Lisboa, 7 December 2001.
- I. PAIVA. Radioactive Waste Management, *Colégio Luisa Sigea*, Estoril, May 2001
- J.H. PEREIRA LUIS. Biological Effects of Radiation. *Faculty of Veterinary Medicine*, Lisbon, 23 January 2001.
- M.J. MADRUGA. The Application of Radioisotopes as Tracers. Master Course in Applied Analytical Chemistry, *Department of Chemistry and Biochemistry, Faculty of Sciences*, Lisbon, June 2001.
- M.J. REIS. Intervention in Case of Radiological Emergency. *Colégio Luisa Sigea*, Estoril, May 2001.
- R. TRINDADE. Nuclear Risks; Risks and Vulnerabilities Training Course; *Civil Protection National Service, SNPC*, Carnaxide, March 2001
- R. TRINDADE. Radioactivity, Irradiation, Contamination, Radiological Protection, Radioactive Wastes; Safety in Chemical Laboratories Training Course, *Institute of Chemical and Biological Technology, ITQB*, Oeiras, May 2001
- R. TRINDADE. Radiological Protection; *Colégio Luisa Sigea*, Estoril, May 2001

Courses attended by DPRSN staff

- A. D. OLIVEIRA, K. JAKOB. Regional Training Course on the Assessment of Occupational Exposure due to Intakes of Radionuclides. *Frederic Joliot-Curie National Research Institute for Radiobiology and Radiohygiene*, Budapest, Hungary, 8-12 October, 2001.
- C. MARCELINO. Regional Training Course on Radiation Protection in Diagnostic and Interventional Radiology. *National Scientific and Applied Centre of Preventive Medicine*, Chisinau, Moldova, 11-15 June, 2001.
- C. PIRES. Training Course in Gamma Spectrometry. *Radiation and Nuclear Safety Authority, Research and Environment*, Laipatie, Helsinki, 1- 30 September 2001
- F. P. CARVALHO. Regional Training Course on Organisation and Implementation of a National Regulatory Programme for the Control of Radiation Sources. Ljubljana, Slovenia, 11-24 June, 2001.
- J. G. ALVES. Regional Training Course on the Assessment of Occupational Exposure due to External Radiation Sources. *Cekmece Nuclear Research and Training Centre*, Istanbul, Turkey, 11-15 June, 2001.
- J. CARDOSO. Regional Training Course on Sources, Assessment, Monitoring and Control of Public Exposure. *Radiation Protection Centre*, Vilnius, Lithuania, 24-Sept.-5-October, 2001.
- L. PORTUGAL. Regional Training Course on the Safe Transport of Radioactive Material. *Radiation Protection Centre*, Vilnius, Lithuania, 26-Nov.-7-December, 2001.
- M.J. MADRUGA. Seminar within the framework of the IAEA Regional Training Course “Depleted Uranium in the Environment” Vienna, Austria, 17-19 September 2001.
- M. J. REIS, Technical Training Programme of CTBTO, Vienna, Austria, 17-20 April and Helsinki, Finland, 22-27 April 2001.

Chemistry Sector

Collaboration in Courses

- J. MARÇALO, Teaching of *Nuclear and Radiochemical Methods* in a MSc Course in Analytical Chemistry, *Universidade de Évora, Departamento de Química*, Évora, March 2001.
- J.P. LEAL, Invited Auxiliar Professor at *Departamento de Química e Bioquímica, Faculdade de Ciências, Universidade de Lisboa*.

Lectures given by ITN staff

- A. PIRES DE MATOS, "Glass Science in Glass and Ceramics", Seminar, Faculty of Fine Arts, University of Lisbon, 11th January 2001.
- A. PIRES DE MATOS, "Some Aspects of the Chemistry and Radiochemistry of Uranium", Seminar, Instituto Superior de Engenharia de Lisboa, ISEL, 24th April 2001.
- A. PIRES DE MATOS, "Glass and Colour", Seminar, Conservation and Restauration Graduation Course, Universidade Nova de Lisboa, 16th May 2001.
- A. PIRES DE MATOS, "Uranium Chemistry and Radiochemistry", Seminar, Chemistry in Everyday Life Discipline, Master of Education in Chemistry, Faculdade de Ciências da Universidade de Lisboa, 18th May 2001.
- A. P. GONÇALVES, Study of the UZn_{12} antiferromagnetic heavy-fermion compound, *Hiroshima University, Graduate School of Advanced Sciences of Matter 2001*, Higashi-Hiroshima, Japan, November 13, 2001.
- M. ALMEIDA, Electrical transport properties of molecular conductors; basic concepts and experimental aspects, *V Escuela Nacional de Materiales Moleculares*, Peñíscola (Castellon), Spain, 2-10 June 2001.
- J.C. WAERENBORGH, Espectroscopia Mössbauer, *Mestrado em Física*, Fac. Ciências da Univ. Lisboa, February 28, 2001.
- ANTÓNIO PAULO, *Radiopharmacy in the Technical Nuclear Medicine Course*, ESTeSL, Lisbon, Jan-Jun, 2001.
- CÉLIA FERNANDES Visualização de Receptores Dopaminérgicos Utilizando Radiofármacos

Marcados com Halogénios e ^{99m}Tc , in the Course *Production and Medical Use of Radiopharmaceuticals*, Coimbra, 9-10 November, 2001

- LURDES GANO, Marcação de Proteínas e Péptidos com Tecnécio- 99m , in the Course *Production and Medical Use of Radiopharmaceuticals*, Coimbra, 9-10 November, 2001
- LURDES GANO, *^{99m}Tc -Radiopharmaceuticals*, in the Pharmacy Course, University of Lisbon, 3, 8, 10 May 2001.
- LURDES GANO, Measure of the Mass of Blood and Quality Control of ^{99m}Tc -Radiopharmaceuticals, *INSTN, Saclay, França*, 20-21 November 2001.
- M.F. ARAÚJO. MSc Lectures (2 sections). *Faculty of Sciences*, Lisbon.
- M.F. ARAÚJO. Fronteiras da arqueologia/ciclo de cinema arqueológico Francês. Palestra e comentários do filme: "Le secret de la fibule". *Museu Nacional de Arqueologia*, Lisbon, 18 October 2001.
- P.M. CARREIRA. MSc Lectures (1 section). *Faculty of Sciences*, Lisbon.
- M.I. PRUDÊNCIO. "Caracterização de cerâmica arqueológica. Proveniência e tecnologia de produção. Importância da caracterização química de centros produtores de cerâmica romana". *Universidade do Minho*, Braga, 11 May 2001.
- T. PINHEIRO. Analytical techniques for trace element determination in biological materials, *Advanced Laboratory Techniques Course*, Zoology and Anthropology Department, *Faculty of Sciences*, Lisbon, 12 December 2001.

Participation in Juries

- A. PIRES DE MATOS, Arguing Member of the Jury of the PhD thesis of A.F. Silva João, "Complexação de Iões de Metais Pesados com o Ião Carbonato", Faculdade de Ciências e Tecnologia da Universidade de Coimbra, Coimbra, January 2001.
- J. P. LEAL, Arguing Member of the Jury of the PhD thesis of Rui Jorge Centeno dos Santos "Estudos Termoquímicos de Ácidos Nicotínicos", *Instituto*

Superior Técnico, Universidade Técnica de Lisboa, Lisboa, April 2001.

- N. MARQUES, Member of the Jury of the PhD thesis of Irene Lopes, "Reactividade de Compostos de Lantanídeos (II)", *Faculdade de Ciências, Universidade de Lisboa, Lisboa, November 2001.*
- J. MARÇALO, Member of a Jury for the admission of an Auxiliary Researcher, *Instituto de Tecnologia Química e Biológica, Oeiras, November 2001.*
- J.C. WAERENBORGH, Member of the Jury of a MSc thesis in Physics, "Study of the magnetic properties of the UFe_xAl_{12-x} compounds", by Cláudia Cardoso, *Dept. Physics, Fac. Ciências Univ. Lisboa, January 2001.*
- M. ALMEIDA, Member of the Jury of a PhD. thesis in Chemistry, *Caracterização Estrutural de Sólidos Moleculares; Relação entre estrutura e propriedades eléctricas e magnéticas* by Isabel Maria Fernandes Cordeiro dos Santos, Instituto Superior Técnico, Technical Univ. Lisbon (12 de Janeiro de 2001).
- M. ALMEIDA, Member of the Jury of a PhD. thesis in Chemistry, by Pedro Manuel de Melo Bandeira Tavares, Universidade de Trás-os-Montes e Alto Douro, (18 de Junho de 2001).
- R. T. HENRIQUES and G. BONFAIT, Members of the Jury of a PhD. thesis in Chemistry, *Estudo de Soluções Sólidas de $(Per)_2 Pt_xAu_{1-x}(mnt)_2$* , by M. J. Matos, Universidade Técnica de Lisboa, Technical Univ. Lisbon
- ISABEL SANTOS, Member of the Jury of a PhD Thesis, IST, *Technical University of Lisbon, 12 September 2001.*
- M.F. ARAÚJO, Member of the Jury of a Graduation Thesis, *Faculty of Sciences, Lisbon, 31 October 2001.*
- M.F. ARAÚJO, Member of the Jury of a Graduation Thesis, *Faculty of Sciences, Lisbon, 18 December 2001.*
- P.M. CARREIRA, Member of the Jury of a Graduation Thesis, *Faculty of Sciences, Lisbon, 9 November 2001.*
- M.I. PRUDÊNCIO, Member of the Jury of a MSc thesis, "Contribuição para o estudo de cerâmicas dos séc. V-VI DC de Braga", *University of Minho, Braga, 10 May 2001.*
- M.I. PRUDÊNCIO, Member of the Jury of a MSc thesis "Cerâmicas pintadas da época romana:

tecnologia, tipologia e cronologia" *University of Minho, Braga, 10 May 2001.*

Reinforcement of ITN Competence

- P. VALÉRIO. Training in Energy Dispersive X-Ray Fluorescence spectrometry (technical co-operation project: Environmental and Marine Studies Using Nuclear Related Techniques - IAEA TC/POR/7/003). *International Atomic Energy Agency, Seibersdorf, Austria, 1 February 2001 to 31 March 2001.*
- P.M. CARREIRA. Scientific visit regarding the collaboration in environmental and marine geochemistry studies (collaboration programme ICCTI/IFREMER). *Univ. Bordeaux I, Bordeaux, France, 25 June 2001 to 1 July 2001.*
- M.F. ARAÚJO. Scientific visit (technical co-operation project: Environmental and Marine Studies Using Nuclear Related Techniques - IAEA TC/POR/7/003). *International Atomic Energy Agency, Monaco, 20 March 2001 to 24 March 2001.*
- M.F. ARAÚJO. Scientific visit (technical co-operation project: Environmental and Marine Studies Using Nuclear Related Techniques - IAEA TC/POR/7/003). *International Atomic Energy Agency, Seibersdorf, Austria, 25 March 2001 to 31 March 2001.*
- M.F. ARAÚJO. Scientific visit regarding the collaboration in environmental and marine geochemistry studies (collaboration programme ICCTI/IFREMER). *Univ. Bordeaux I, Bordeaux, France, 25 June 2001 to 1 July 2001.*
- Training of experimental work of the following grant-holders:
T. Barbosa
Dulce Franco
Guilherme Cardoso
Rosa Marques
included in the "Curso para técnicos especializados de laboratório. projecto: Reforço de Competências em Protecção e Segurança Radiológica e Nuclear".

Courses Organised at ITN

MSc degree course in Archaeometry

- Two Masters Degree Thesis in Archaeology, Archaeology Unit., Univ. Minho.
Supervision by M. Isabel Prudêncio

Physics Sector

Lectures given by ITN staff

- J. SALGADO, Radiations in everyday life and environment. *Lectures MSc Course, Faculty of Sciences*, University of Lisbon (2001).
- J. SALGADO, Ionizing radiation. Interaction with the matter. *IV Radiation Protection Course for medical doctors*, Lisbon, 28 November 2001.
- J. SALGADO, Ionizing radiation: its characterization. *4th Meeting on Occupational Health in Hospitals and other Health Care Services*, Lisbon, 7 November 2001.

Participation in Juries

- J. SALGADO, Member of the Jury for recruitment of One Coordinator Researcher for the Radiological Protection and Nuclear Safety Department, *ITN*, Lisbon, 2001.
- J. SALGADO, Member of the Jury for recruitment of One Coordinator Researcher for the Nuclear Reactor, *ITN*, Lisbon, 2001.
- J. SALGADO, Member of the Jury for recruitment of Eight Principal Researchers for the Radiological Protection and Nuclear Safety Department, *ITN*, Lisbon, 2001.
- J. SALGADO, Member of the Jury for recruitment of Two Principal Researchers for the Nuclear Reactor, *ITN*, Lisbon, 2001.
- E. ALVES, Invited Coordinate Professor at *High School of Health Technologies of Lisbon*, Classes: Applied Physics (1st Semester); Atomic and Nuclear Physics (2nd Semester).
- L.C. ALVES. Utilisation of a Nuclear Microprobe: Why, how and what for? *Nuclear Physics Center from the Lisbon University*, Lisbon, 12 November 2001.
- L.C. ALVES, M. VILARIGUES. Applications of the PIXE Technique in Archaeometry, *ITN-*

Workshop on Applied Sciences to Archaeology, Lisbon, 23 November 2001.

- S. CABO VERDE, practical suport on microbial biotechnology class - "Effect of gamma radiation on natural contaminant of wastewater sample". *Faculty of Sciences*, Lisbon October 2001.
- M.L.BOTELHO "Sterilization by gamma radiation" in II Jornadas da Associação Nacional de Esterilização, Torre do Tombo, Lisbon, June 2001.
- M.L.BOTELHO "Sterilization by gamma radiation" in II Jornadas de Enfermagem Peri-Operatória, Hospital Distrital da Figueira da Foz, October 2001.
- E. ALVES, Member of the Jury of the MSc thesis of Ana Pascoal, *Faculty of Sciences*, Lisbon, 27 April 2001.
- E. ALVES, President of the Jury for Adjunct Professor in Radiology, *High School of health Technologies of Lisbon*, Lisbon, 15,16 November 2001.
- E. ALVES, President of the Jury for Adjunct Professor in Radiotherapy, *High School of health Technologies of Lisbon*, Lisbon, 12,13 November 2001.
- E. ALVES, President of the Jury for Adjunct Professor in Nuclear Medicine, *High School of health Technologies of Lisbon*, Lisbon, 12,13 November 2001.
- E. ALVES, Member of the Jury for Adjunct Professor in Cardiopneumology, *High School of health Technologies of Lisbon*, Lisbon, 7,8 November 2001.
- M.L.BOTELHO, Member of the Jury thesis, "Efeito da Radiação gama em efluentes", Escola Superior Agrária de Santarém, December 2001.

Education and Training

- Classes given for the "Nuclear Techniques Course – Physics Graduation", *Physics Dept., Faculty of Sciences, Lisbon University* – Ana Rita Ramos, Luís Cerqueira, Nuno Barradas, Andreas Kling, José Marques.

Ciência Viva Activities

Coordinator: José Salgado

ITN participates in the following activities promoted by the “Ciência Viva” Unit of the Portuguese Ministry for Science and Technology:

1. *Ciência Viva Programme*;
2. *Science in the holidays for young people*;
3. *Science in holidays for teachers*;
4. *Ciência Viva Forum*;
5. *Science and technology week*.

The objective of the *Ciência Viva Programme* is to promote experimental science in primary and secondary schools. The programme encourages partnership between schools and the scientific community. ITN was involved, submitting three projects, two of which have already been accepted for funding.

1. *Knowing radiations* (PV-0491, approved, Co-ordinator: A. Falcão, ITN);
2. *Radiation effects on morphologic characteristics of plants* (PV-0484, approved, Co-ordinator: Maria Margarida Feliciano, Escola Profissional Agrícola Fernando Barros Leal – Torres Vedras);
3. *Radiation Physics Itinerant Laboratory* (submitted, Co-ordinator: J. Salgado)

Science in the holidays for young people is a holiday occupation programme providing secondary school students with the opportunity of a first contact with research, through their participation in training activities carried out at research centers. ITN proposed the following activities:

1. *Remote control using a PC*, supervisor J. Neves (2 weeks);
2. *Radiation Physics Experiments*, supervisor J. Salgado, I. F. Gonçalves and A. Falcão (2 weeks);
3. *Activation Experiments in the RPI*, supervisor I. C. Gonçalves (2 weeks);
4. *Influence of the crystal sizes in its enthalpy of formation*, supervisor J. P. Leal (2 weeks);
5. *Radiation and matter*, supervisor R. Silva, L. Prudêncio and M. Vilarigues (2 weeks);
6. *Gamma ray dosimetry*, supervisor A. F. Carvalho and L. Santos (2 weeks);
7. *Introduction to parallel processing computers: building a Beowulf cluster*, supervisor N. Pinhão (3 weeks);
8. *Characterisation of polymeric materials*, supervisor L. Ferreira and H. Casimiro (2 weeks);
9. *Inactivation of microorganisms in eggs by gamma rays*, supervisor S. Cabo Verde and R. Ribeiro (2 weeks);

10. *Characterisation of aerosols*, supervisor M. Reis (2 weeks);
11. *Estimate of chromosomal aberrations*, supervisor J. P. Luís (4 weeks);
12. *Dosimetry of beta radiation*, supervisor A. F. Carvalho and J. Cardoso (2 weeks).

Seventeen students from thirteen high schools carried out experimental work at ITN during summer of 2001.

Science in holidays for teachers is a holiday occupation programme for teachers. ITN proposed five activities:

1. *The RPI and the dream of the alchemist*, supervisor J. C. Soares (1 week);
2. *Can we measure the nuclear radius?*, supervisor A. R. Ramos (1 week);
3. *Characterisation of atmospheric aerosols by analytical nuclear technics*, supervisor M. Reis (1 week);
4. *Radiocarbon datation*, supervisor R. Marques (1 week);
5. *Environmental Chemistry*, supervisor M. F. Araújo (1 week).

In 2001, two candidates participated in the 4th activity.

Ciência Viva Forum is a public event aimed at publicising, debating and reflecting on the activities carried out within the scope of the on going *Ciência Viva* projects. It provides an opportunity for the participants in the projects to share their knowledge and experience in order to consolidate the work carried out and to develop future projects. ITN participated in the 5th Forum with two kiosks and poster panels. Students and teachers could carry out some simple experiments in radiation physics.

The aim of the *Science and Technology Week* is to show to the general public the science that is being carried out in Portugal. In the framework of the science and technology week, ITN participated in the so-called *Open Day*, organizing guided tours to the Institute, to show our facilities, what are we researching, who are our scientists, how we work, which are our results. About two hundred visitors visited ITN in the Open Day.

Approved Projects

	ITN budget ($\times 10^3$ PTE)
- <i>Knowing radiations</i>	
Total budget $1\,920 \times 10^3$ PTE, ITN budget $1\,920 \times 10^3$ PTE (Nov 2001 to Oct 2003)	1 920
Prime contractor: ITN Co-ordinator: A. FALCÃO, collaborators: J. Salgado. E. Martinho, C. Oliveira, I.F. Gonçalves	
Partners: Colégio Santa Doroteia (Lisboa), Esc. Secundária Dr António C. Figueira (Loures)	
- <i>Radiation effects on morphologic characteristics of plants</i>	
Total budget 755×10^3 PTE, ITN budget 300×10^3 PTE (Dec. 2001 to May 2003)	300
ITN Co-ordinator: J. SALGADO	
Prime contractor: Escola Profissional Agrícola F. Bbarros Leal – Torres Vedras,	
Co-ordinator: M.M. FELICIANO	
Partners: ITN (J. Salgado, E. Martinho), Instituto Superior de Agronomia	
Total budget	2 220

Submitted Projects

	ITN budget ($\times 10^3$ PTE)
- <i>Radiation Physics Itinerant Laboratory</i>	
Total budget $5\,375 \times 10^3$ PTE (2 years)	5 375
Prime contractor: ITN Co-ordinator: J. SALGADO	
Collaborators: E. Martinho, A. Falcão, I. F. Gonçalves	
Total budget	5 375