

## 9. Contracts

	Project	Co-ordinator	Partners	Funding
<b><u>New Materials and Compounds:</u></b>				
• <b><i>Nuclear Solid State Physics Using Ion Beams</i></b>	Formation of metallic nanocrystals in Sapphire ( $\alpha$ -Al <sub>2</sub> O <sub>3</sub> ) and rutile (TiO <sub>2</sub> ) by ion implantation (PRAXIS/P/CTM/12067/98)	E.Alves Dept. Physics, ITN	M. Cruz, Dept. Física, FCL	PRAXIIS XXI 6 × 10 <sup>6</sup> PTE
	European Fusion Long-Term Technology Programme - <u>Sub-Task:</u> Precise Ion Beam Analysis of Advanced Materials	E.Alves Dept. Physics, ITN	C. Varandas, IST	Euratom Fusion Tech. Programme 5 × 10 <sup>6</sup> PTE
	Be binary pebble bed electrical resistivity measurements	E.Alves Dept. Physics, ITN		Euratom Fusion Tech. Programme
	Doping effects on the behavior of mixed valence oxides ceramics with strongly correlated electrons (PRAXIS/P/CTM/13142/98)	J. Vieira Dept. de Engenharia Cerâmica e Vidro, U. de Aveiro	E.Alves, Dep.Física, ITN V. Amaral, Inst. Física dos Materiais, U. Porto P. Tavares, UTMAD	PRAXIS XXI
	Metastable alloys in Al-Cr system, produced by ion implantation and laser processing	O. Conde Dep. Física, Fac. Ciências, Universidade de Lisboa	IST Rui C. da Silva (ITN)	PRAXIS/PCEX/P/FIS/2/96
	Metastable alloys in Ti-Cr system, produced by ion implantation and laser processing	R.C. da Silva Dep. Física, ITN	FFCUL IST	PRAXIS/P/CTM/10037/98
• <b><i>Condensed Matter Physics</i></b>	Microstructure investigation of organic-inorganic hybrid materials PRAXIS/C/CTM/12212/1998	F. Margaça, ITN, Physics Dep.	I. M. Salvado, Aveiro University, Glass and Ceramic Engineering Dep.	PRAXIS XXI and E.C. funding of neutron beam time via TMR-LSF Programme
	Characterisation and modelling of physical properties of high-temperature coated superalloys PRAXIS/PCEX/P/FIS/21/96	António Sequeira, ITN, Physics Dept.	Johan Bressers, Instituto for Advanced Materials, Institute of Advanced Materials, JRC-Petten Prof. Rui Vilar, IST	PRAXIS XXI
• <b><i>Solid State Physics and Chemistry</i></b>	1996-1999 “Magnetic Molecular Materials based on Dithiolate Complexes”; PBIC/C/QUI/2204/95	V. Gama		7×10 <sup>6</sup> PTE
	1999-2001 “Molecular Magnetic Materials based on the Conjugated Polynitriles RR’-DCNQI”, PRAXIS/P/QUI/12063/1998	V. Gama	M.T. Duarte, Instituto Superior Técnico	25×10 <sup>6</sup> PTE
	1995-1999 “Charge Transfer Solids: From Transition Metal Chalcogenates to Synthetic Metals”; PRAXIS/2/2.1/QUI/203/94	R.T. Henriques	M.T. Duarte, Instituto Superior Técnico	30×10 <sup>6</sup> PTE (ITN)

1996-1999 "Vortex Motion in High Tc Superconductors" PRAXIS, 2/2.1/QUI/410/94	G. Bonfait	M. Godinho, FCUL	PRAXIS
1999-2002: "Heavy Fermions properties of (U <sub>x</sub> Th <sub>1-x</sub> Pt <sub>2</sub> In e U <sub>x</sub> Th <sub>1-x</sub> Pd <sub>2</sub> Sn) families", PRAXIS XXI, PRAXIS/P/FIS/12070/1998.	G. Bonfait		PRAXIS
1996-1999: "Characterisation of superconducting thin films", ICCTI-French Embassy	G. Bonfait		
1999-2001: "Films and multilayers containing uranium and iron: preparation and magnetism" PRAXIS/P/CTM/12068/1998	A. P. Gonçalves	M. Godinho, FCUL	18×10 <sup>6</sup> PTE (10.8×10 <sup>6</sup> PTE - ITN)
1999:Synthese, croissance cristalline et etudes des propriétés physiques des nouveaux materiaux intermetalliques à base des éléments f", ICCTI-CNRS	A. P. Gonçalves	Henri Noel, Université de Rennes	0.8×10 <sup>6</sup> PTE (0.5×10 <sup>6</sup> PTE - ITN)
1999-2001: "Fe sublattice interactions in AFe <sub>x</sub> Al <sub>12-x</sub> intermetallics (A =f element) with ThMn <sub>12</sub> -type structure ICCTI-CSIC bilateral programme, "Multisulfured based charge transfer solids",.	J.C.Waerenborgh		4.8×10 <sup>6</sup> PTE (4.8×10 <sup>6</sup> PTE - ITN)
1996-1999: "Intermetallic magnetic materials: interstitial materials of 5f element ternary compounds with ThMn12-type structure" PRAXIS/2/2.1/QUI/202/94	M. Almeida	Nuno Ayres de Campos, FCTUC	10×10 <sup>6</sup> PTE (5×10 <sup>6</sup> PTE - ITN)
COST D14- Action "Towards new molecular inorganic conductors"	M. Almeida	J. Reedijk P. Cassoux P. Day. J. Veciana M. Belito	
COST C-518 -"Molecular Materials and Functional Polymers for Advanced Devices"	M. Almeida	E. Coronado	

**Environmental Sciences:**

• **Health and Environmental Studies Using Ion Beam Techniques**

From air to human lungs (POR9479)	T. Pinheiro, Dept. Physics, ITN	A. Bugalho de Almeida, Dept. Pneumology, FM-UL M.C. Freitas, Reactor, ITN	IAEA
Research on Ecotoxicity Indicators in Aquatic Communities at the Guadiana River (PEAM/P/NMA/666/95)	Maria da Luz Mathias, FC- UL	T. Pinheiro, ITN	JNICT/DGA

<ul style="list-style-type: none"> <li>• <b>Atmospheric Elemental Dispersion</b></li> </ul>	Study of Atmospheric Dispersion of Pollutants in the Industrial Environmental Region of the Sado Estuary using Biomonitors (contract DGA-26/96) Set./96 - Set. /99	M.C. Freitas	CFNUL	DGA
	Design, Production and Certification of Synthetic Polymeric Reference Material for Multielement Analysis (EU - PERM STM4-CT-95-2034) Jan./1996 - March/1999	M.C. Freitas	15 EU Partners	EU
	ValorSul - Monitoring of Air Quality at the Incinerator of S. João da Talha Started Nov./98, Renewed Nov./99	M.C. Freitas	IDAD	IDAD
	Study of Atmospheric Dispersion of Pollutants in the Industrial Region of the Sado Estuary using Biomonitors (contract IAEA-CRP9938) December/97-December/2001	M.C. Freitas	14 Partners	IAEA
	ValorSul-Monitoring of trace elements in CTRU	Ângela Gouveia	ValorSul	ValorSul
	Mármoreos romanos em Portugal (caraterização artística, petrográfica, química e isotópica)	Peixoto Cabral		FCT
<ul style="list-style-type: none"> <li>• <b>Environmental Analytical Chemistry</b></li> </ul>	Heavy Metal Pollution in the Trancão River Basin - Soils, Sediments and Water Resources (PEAM/P/GAG/226/93 (DGA 33/95)	M.F. Araújo Dept. Chemistry, ITN	T. Pinheiro, L.C.Alves Dept. Physics, ITN	DGA
	Management of Coastal Aquifers in Europe: Paleowaters, Natural Controls and Human Influence – Palaeaux (ENV4-CT95-0156)	British Geol. Survey	P.M. Carreira, ITN U. Gent, Belgium GSDG, Denmark U. Paris-Sud XI, France U. Polit.Cataluna, Spain U. Aveiro, Portugal U. Amsterdam, Netherlands U. Bern, Switzerland	EC
	Environmental Isotopes and Noble Gas Palaeothermometers in the Study of Climatic Change Encoded in the Palaeowaters of the Aveiro Aquifer (PRAXIS/2/2.1/CTA/321/94)	U. Aveiro	P.M. Carreira Dept. Chemistry, ITN	PRAXIS
	Ocean Margin Exchange – OMEX (MAST Program)	U. Libre Bruxelles	U. Algarve M.F. Araújo Dept. Chemistry, ITN	UE

•**Inorganic  
Chemistry,  
Radiochemistry  
and Radio-  
pharmacy:**

<b><u>Inorganic and Organometallic Chemistry</u></b>	Applications of Fourier Transform Ion Cyclotron Resonance Mass Spectrometry (FTICR/MS) to Gas Phase Chemistry (PRAXIS/PCEX/C/QUI/72/96)	Joaquim Marçalo de Almeida Dept. Chemistry, ITN	PRAXIS XXI 15 000 c.
	Chemical Behaviour in the Heterogeneous Phase of Compounds of the f-Elements (PRAXIS/2/2.1/QUI/386/94)	A. Pires de Matos Dept. Chemistry, ITN	PRAXIS XXI Total - 15600 ITN - 5312 c.
		A. Moutinho UNL	
		Carlos Henriques, Dept. Chem. Eng., IST	
		M. Helena Dept. Chemistry, ISEL	
	Compounds of f-Elements: Synthesis, Characterization and Reactivity Studies (PRAXIS/2/2.1/QUI/454/94)	Isabel Rego dos Santos Dept. Chemistry, ITN	PRAXIS XXI
	Correlation of Gas and Condensed Phase Reactivity of Organolanthanide Metallocenes and Related Species (CRG940628)	Joaquim Marçalo de Almeida Dept. Chemistry, ITN	NATO Total - 1750 c. ITN - 200 c.
		William J. Evans Dept. Chemistry, Univ. California-Irvine	
	Energetics, Structure and Reactivity of Molecules (PRAXIS/2/2.1/QUI/51/94)	J. A. Martinho Simões Dept. Chemistry, FCUL	M.E. Minas da Piedade Dept. Chem. Eng., IST João Paulo Leal Dept. Chemistry, ITN
			PRAXIS XXI Total 35833 c. ITN - 2050
	FTICR/MS Study of the Gas Phase Chemistry of Intermetallic Ions of the <i>f</i> and <i>d</i> Blocks (PBICT/C/QUI/2188/95)	Joaquim Marçalo de Almeida Dept. Chemistry, ITN	FCT Total -6875 c ITN 825 c.
	Gas Phase Chemistry of Rare Earth Alkoxides and Aryloxides (B3 081)	Joaquim Marçalo de Almeida Dept. Chemistry, ITN Serge G�ribaldi GRECFO, Universit� de Nice-Sophia Antipolis	ICCTI French Embassy in Portugal Total 220 c. ITN - 300 c.
	Inorganic and Organometallic Compounds of Lanthanides - Luminescent Properties of Lanthanides	A. Pires de Matos Dep Chemistry, ITN	G. Vicentini Dep. Chemistry, Universidade de S. Paulo, Brasil
			ICCTI / CNPq 240 c.
	Rhenium Complexes with Nitrogen Donor Ligands (PRAXIS/P/QUI/10047/1998)	Carlos C. Rom�o ITQB	Isabel Rego dos Santos Dept. Chemistry, ITN
			PRAXIS XXI
	Structure and Reactivity of Glycosidic Derivatives of Flavonoids and their Synthetic Analogues: a Fundamental Investigation by Mass Spectrometric Techniques (PRAXIS/2/2.1/QUI/119/94)	M. Alzira Almoester Ferreira Dept. Chemistry, FCUL	A. Pires de Matos, Joaquim Marçalo de Almeida Dept. Chemistry, ITN
			PRAXIS XXI 35866 c. ITN - 2000 c.-

	Synthesis and Application on Catalysis of f-Elements with Chelate Ligands (423/RFR/7)	Isabel Rego dos Santos Dept. Chemistry, ITN	Jacqueline Collin ICMO, Université de Paris-Sud	ICCTI/MNERS
	Thermochemistry and Structure of Organic and Organometallic Compounds - Energetics of Lanthanide Alkoxides	M.E. Minas da Piedade Dept. Chem. Eng., IST	Mathias Epple University of Hamburg, Germany	CRUP Total - 600 c. ITN - 175 c.
	Thermochemistry of Inorganic and Organometallic Compounds (PBICT/C/QUI/1941/95)	João Paulo Leal Dept. Chemistry, ITN	João Paulo Leal Dep Chemistry, ITN	FCT 660 c.
• <b>Radiopharmaceutical Development</b>	Síntese e caracterização de complexos de tecnécio com biguanidas	Maria Neves	ITN IBILI	(PRAXIS/2/2.1/SAU/1396/95)
	Radiopharmaceuticals for Bone Therapy: A Molecular Mechanics Study of Lanthanides Bisphosphonates Complexes	Maria Neves	ITN INETI FCT/ Dep. de Química (Univ.Coimbra)	PRAXIS XXI (PRAXIS/C/SAU/14036/1998)
	Development of <sup>99m</sup> Tc labelled somatostatin and evaluation of their radio-chemical and biological behaviour	Lurdes Gano	ITN	IAEA (8972/R1)
	“17α-[ <sup>125</sup> I]Iodovinyl steroids Substituted at 7α: Investigation of a New Series of Iodine [ <sup>125</sup> I]-Labelled estrogens as Potential Imaging Agents for Estrogen Receptor-Positive Breast Cancers”.	Luciana Patrício	ITN FF(Univ. Coimbra) IBILI	PRAXIS XXI (PSAU/C/SAU/89/96)
<b><u>Nuclear Engineering:</u></b>				
• <b>Operation and Exploitation of the RPI</b>	Fast Neutron Irradiation of Electronic Components for the LHC/CERN in the Portuguese Research Reactor (CERN/P/FIS/15181/1999)	J.G. Marques Reactor, ITN	J.A. Agapito, Univ. Complutense Madrid, Spain; J. Casas, CERN	ICCTI
• <b>RPI Dosimetry</b>	A Code of Practice for Dosimetry of BNCT in Europe (SMT4-CT98-2145)	F.S.Rasmussen JRC Petten	STUK (FI), HY (FI), ECN (NL), JRCP (EUR), NKI (NL), BU (GB), ITN (PT) NRI (CZ), TUB (HU), ZU (CH)	
• <b>Applied Dynamics</b>	Remote Impact Identification	J. Antunes ITN,	L. Borsoi; P. Izquierdo, Ph. Piteau; T.Grunenwald M. Paulino ISEL, Dep. Mech. Eng. A. Urgueira UNL, Dep. Mech. Eng	Contract with Commissariat à l’Energie Atomique, France

Experimental Modal Identification	J. Antunes ITN,	J. Soares EDP/Companhia Portuguesa de Produção de Electricidade P. de Araújo Université Technologique de Compiègne (France)	Contract with EDP/Companhia Portuguesa de Produção de Electricidade
Optimisation of Rotor Balancing	J. Antunes ITN,	J. Soares EDP/Companhia Portuguesa de Produção de Electricidade M. Paulino Instituto Superior de Engenharia de Lisboa, Dep. Mech. Eng.	
Identification of Machinery Under Working Conditions	C. Martins INESC	J. Antunes ITN, Applied Dynamics E. Ataíde INETI, Electr. Dep. R. Sampaio ENIDH	Praxis XXI
Modelling of Vibration-Generated Droplets	J. Antunes ITN	M. Fátima PROENOL M. Moreira Instituto Politécnico de Setúbal R. Sampaio ENIDH	Contract with PROENOL

**Industrial Technologies:**

• <b>Nuclear Instruments and Methods</b>	“The RELIC Project” CERN/P/FIS/1211	T.A. Girard Centro de Física Nuclear, University of Lisbon	C. Oliveira, ITN	FCT
	“Dynamics of Symmetry-breaking Type I Superconducting Phase Transitions”  PRAXISFIS/10033	T.A. Girard Centro de Física Nuclear, University of Lisbon	C. Oliveira, ITN	FCT
	Variable voltage gas discharges for surface treatment (ICCTI 423/OMFB)	M. Pinheiro Centro de Física dos Plasmas / IST	N. Pinhão, ITN Z. Donkó, K. Rózsa, G. Bánó, K. Kutasi, SZFKI, Hungria	ICCTI
• <b>Radiation Technologies:</b> • <b>Processes and Products</b>	Dosimetry for Radiation Sterilisation of Medical Devices	Peter Sharp, NPL UK Arne Miller, Riso, Denmark	M.E. Andrade ITN and others European Irradiation Facilities	UE
	Study Case on Medical devices Manufacturing – Bioburden Studies in/on product. Gamma Sterilisation <i>versus</i> Sterilisation with Steam under Pressure	M. L. Botelho ITN, Physics, ITN	INFARMED BASTOS VIEGAS FAPOMED OFTALDER APORMED	AdI-Praxis XXI med. 3.1 Praxis XXI med.4 (70%), Industry (30%)

Microbial Validation- Sterilisation Dose to Gamma Irradiate the Lyomer Products in UTR	M. L. Botelho, Physics ITN	JABA	JABA
Analysis of Control Critical Points in the Line Production of Water	M. L. Botelho, Physics ITN	EMPOA	EMPOA
New Forms of Bioactive Ophthalmologic and Dermathologic Products	A. M. Baptista, Oftalder	INETI ITN	PEDIP
Microstruture investigation of organic-inorganic hybrid materials	F.M.A. Margaça, ITN	University of Aveiro	Praxis XXI ITN

**Cultural Heritage and Sciences:**

• ***Cultural Heritage and Sciences***

Causes and mechanisms of degradation of igneous rocks in monuments from Minho, Alentejo and Azores PRAXIS 2 /2.1/CSH/254/95	M.I. Prudêncio Dept. Chemistry, ITN	J.Delgado Rodrigues, LNEC M.A. Sequeira Braga, UM M.O. Figueiredo, ICT P. Romão, CECRA	PRAXIS XXI
Alteration processes and conservation methods of the built patrimony made of granite PRAXIS 3/3.1/CEG / 2516 / 95	J.Delgado Rodrigues, LNEC	M.I. Prudêncio, ITN	PRAXIS XXI
Production and technology of Roman pottery: <i>Bracara Augusta</i> Case PRAXIS / HAR / 13047	M.I.Prudêncio, ITN	M.A. Sequeira Braga, CCA/UM M.M. Martins, UA/UM F. Oliveira, CMVNF	PRAXIS XXI
Roman marbles in Portugal: artistic, petrographic, chemical and isotopic characterisation PRAXIS 2/2.1/CSH/819/95	J.M.P. Cabral, ITN	J. Encarnação, IA/Univ. Coimbra M. Justino Maciel, UNL F. Gonçalves, DG/UE	PRAXIS XXI
Paleobiology and paleodiets from the Mesolithic to the Late Neolithic: the Portuguese case. Contribution of the trace elements and stable isotopes. PRAXIS PCNA/C/BIA/114/96	E. Cunha, IAV, Univ. Coimbra	J.M.P. Cabral, ITN	PRAXIS XXI
Archaeometry: characterisation of archaeological ceramics Monitoring program of trace elements in the vicinity of CTRSU (S. João da Talha)	M.I. Prudêncio Dept. Chemistry, ITN  M.A. Gouveia	Archaeologists responsible of each project	IPA  VALORSUL

**Radiological  
Protection,  
Environmental  
Radioactivity  
and Nuclear  
Safety**

Radionuclide fluxes in freshwater: FI4P-CT95-0018	Rob Comans, ECN (Petten, The Netherlands)	Carolina Carreiro, ITN/DPRSN and several other European partners	European Commission
European research into radon in construction concerted action (ERRICCA)	Chris Scivyer, Building Research Establishment (U.K.)	M. C. Faisca, ITN/DPRSN and several other European partners	European Commission
FI4P-CT96-0064 Aquifers and Surface-Waters in the Chernobyl Area-Observations and Predictive Evaluation	J. Smith Institute of Freshwater Ecology (IFE), UK	M.J. Madruga ITN/DPRSN and several other European partners	European Union (Inco-Copernicus)
ERB IC15-CT98-0205 Concerted Action to establish and run a user group for the EC computer System PC-CREAM	J.R Simmonds NRPB (UK)	R.Trindade ITN/DPRSN and several other European partners	ERB F14P-CT98-0074
Contamination of Coastal Lagoons in tropical regions IC-18-CT98-0264	Fernando Carvalho ITN/DPRSN	Univ. of Sterling Univ. of Campeche (Mexico) Univ. Fed. da Baía (Brasil) Univ. de Coimbra (Portugal)	European Union
CTBTO Site Study in Azores CTBTO/99/30/6034	Fernando Carvalho ITN/DPRSN	Fernando Carvalho	IAEA