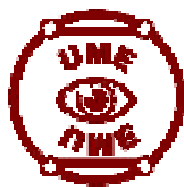


RNME – REDE NACIONAL DE MICROSCOPIA ELECTRÓNICA
NATIONAL ELECTRON MICROSCOPY NETWORK

RNME – Pole of the University of Trás-os- Montes e Alto Douro



Unidade de Microscopia Electrónica

ACTIVITY REPORT
2010



1. Global characterization of the Pole activity and progress.

In the period under consideration **58 users (and 874 visits)** required services of the UME at UTAD, divided by:

- i) Training activities / Courses / Classes;
- ii) Teachers / Researchers (PhD);
- iii) Researchers (PhD under research grant contract);
- iv) PhD Students;
- v) MSc Students;
- vi) BSc/License Students;
- vii) Public and private companies;
- viii) Maintenance.

2. Resources and operation conditions.

2.1. Material resources.

- Scanning electron microscope (SEM FEI Quanta 400), with environmental SEM / E-SEM and chemical analysis by EDS (EDAX), resolution of 4 nm.
- Transmission electron microscope (Leo 906 TEM 120 kV), resolution of 0.33 nm; conventional photographic acquisition system;
- Carbon deposition and gold sputtering (Polaron);
- Ultramicrotome (RMC Power Tome XL);
- Optical microscope and Magnifying glass (MOTIC) for sample preparation

2.2. Human resources supporting the experimental facilities operation.

According to UTAD regulations, the management of equipment and human resources (UME Technician) is made under the Foundation Rei D. Dinis / UTAD. The supervision of UME is made by two Senior Investigators of UTAD. A technical commission of five investigators is responsible for formation, sample preparation, consulting, maintenance and guide-visits.

Scientific and technical resources

Name	Degree	Contract Category	Function in the RNME	RNME (h/week)
Ana Maria Nazaré Pereira	PhD	Full Professor	UME supervisor	2
Pedro Bandeira Tavares	PhD	Associate Professor	UME supervisor. SEM and TEM operator, formation, maintenance. Inorganic samples advisor.	12
Teresa Pinto	PhD	Auxiliary Professor	Biological samples preparation and advisor.	2
Paula Avelar Rodrigues	PhD	Auxiliary Professor	Ultramicrotome operator and formation Biological samples preparation and advisor.	2
Sandra Mariza Monteiro	PhD	Auxiliary Professor	Biological samples preparation and advisor.	2
Lisete Fernandes	Master Student	Technician	UME Technician. Sample preparation SEM and TEM operator. Maintenance.	36

2.3. Rules and access conditions to the electron microscopy experimental facilities.

The requested services are subject to schedule, taking into account the constraints imposed by the operator (Technician of UME), maintenance or other obligations for the proper functioning of the equipment. The agenda should be carried out during the week prior to the completion of the work. The work from Research Centers of UTAD has priority if the Technical Commission decides it. Biodegradable samples have also priority treatment.

Prices charged for services provided by UME are defined based on a table. This table and other relevant information are available at: <http://home.utad.pt/~ume>. The price for all RNME members is the same.

3. Training activities.

3.1 Training, information and demonstration activities addressed to researchers and to other users of the RNME.

The UME offers the possibility of teachers, technicians and researchers from UTAD become operators of SEM. A course with 3 steps must be accomplished:

- i) theoretical module (SEM and TEM);
- ii) sample preparation module;
- iii) operator module.

This last module represents a personalized instruction that involves specific training, with at least 12 hours of work.

For the TEM (only after the SEM course), the formation is divided into two phases:

- i) sample preparation (divided in biological and non-biological samples);
- ii) operator module, with a minimum of 10 hours of individual training for each module.

In the final, an examination will take place that confers the certificate.

3.2 Teaching, training, information and demonstration activities in the frame of the University curricular activities

3.2.1 Training activities:

Training of equipment users/operators	Full Duration Hours	Participants
SEM operator TEM operator	30h	Lisete Fernandes
SEM operator TEM operator	14h	Gopal Mishra (PhD grant)
SEM operator TEM operator	12h	Marco Lucas (PhD grant)
SEM operator	10h	Cristina Oliveira (Auxiliary Professor)

3.2.2 Curricular units with training and teaching in electron microscopy unit:

	Curricular unit	Course
PhD courses 3 th cycles	Materials	Quaternary, Materials and Cultures
	Materials	Forestry
Master's courses 2 th cycles	Instrumental Methods of Analysis	Laboratory Clinical Biology
	Histology and Pathology Techniques	Health Sciences Biotechnology
Degree courses 1 st cycles	Cell biology	Biology and Geology for Education
	Cellular and Molecular Biology	Biomedical Engineering
	Laboratory techniques	Biochemistry
	Developmental Biology	Bioengineering
	Cellular and Molecular Biology	Food Science
	Cellular and Molecular Biology	Biology
	Cell biology	Genetics and Biotechnology
	Cell biology	Applied Ecology
	Chemistry	Electronic Engineering

3.2.3 Study visits to UME:

Origin	Promoter	Number of Students
Esc. Sec.de Mondim de Basto	R.P.I.	182
Esc. Camilo Castelo Branco	UME	40
Esc. Peso da Régua	R.P.I.	55
Esc. Sec.de Penafiel	R.P.I.	50
Instituto Politécnico de Bragança	R.P.I.	15
Esc. Sec. Morgado Mateus	UME	60
Esc. Sec. de Sabrosa	UME	50
Esc. Sec. de Viana do Castelo	UME	40
Esc. EB 2,3 de Sta.Marta	R.P.I.	60
Ciência Viva Project	UME	8
Biology Conference Workshop	UME	10
	Total	570

R.P.I. – Relações públicas e Institucionais da UTAD (UTAD Public Relations)

UME – Unidade de Microscopia Electrónica da UTAD (UTAD - Electronic Microscopy Unit)

4. Electron Microscopy service activity and collaboration in research and development projects

4.1 Electron Microscopy service activity

User Class Application	Number of Users	Number of Work Sessions	Number of Hours (h)
Visitors	570	31	65
Classes	298	22	56
Training activities	4	82	62
Teachers / Researchers (PhD)	26	67	193
Researchers (PhD) (under Research Grant contract)	7	26	62
PhD Students	13	38	130
MSc Students	4	6	17
BSc / Licence Students	3	4	11
Public and private companies (Industry and Services)	3	39	115
Maintenance	2	10	32
TOTAL	930	325	743

Users List:

Teachers / Researchers (PhD)	Equipment		Department Faculty	University Institution
	SEM/EDS	TEM		
Cristina Freire	✓	✓	FCUP	University of Porto
Cristina Oliveira	✓	✓	ECVA	UTAD
Pedro Tavares	✓	✓	ECVA	UTAD
Teresa Pinto	✓	-	ECVA	UTAD
Paula Braga	✓	-	ECT	UTAD
Teixeira Pinto	✓	-	ECT	UTAD
José Morais	✓	-	ECT	UTAD
Tiago Pinto	✓	-	ECT	UTAD

José Luís Lousada	✓	-	ECAV	UTAD
Rui Teixeira	✓	-	ECVA	UTAD
Artur Sá	✓	-	ECVA	UTAD
Alice Moura	✓	-	ECAV	UTAD
Rosa Rego	✓	✓	ECVA	UTAD
Amélia Silva	-	✓	ECVA	UTAD
Paula Rodrigues	-	✓	ECAV	UTAD
Fernando Pereira	-	✓	FEUP	University of Porto
Adélio Mendes	✓	-	FEUP	University of Porto
Senentxu Lanceros-Méndez	-	✓	Physics Department	University of Minho
Nuno Vaz	✓	-	ECVA	UTAD
Cristina Antunes	✓	-	ECVA	UTAD
Nuno Cristelo	✓	-	ECT	UTAD
Elisa Preto	✓	-	ECVA	UTAD
Eunice Bacelar	✓	-	ECVA	UTAD
Alexandra Esteves	✓	-	ECAV	UTAD
Carla Amaral	✓	-	ECAV	UTAD
Ana Rita Lázaro	✓	-	ECAV	UTAD
Carlos Carvalho	✓	-	ECAV	UTAD

Researchers (PhD) (under Research Grant contract)	Equipment		Department Faculty	University Institution
	SEM/EDS	TEM		
Gopal Mishra	✓	✓	ECVA	UTAD
Marco Lucas	✓	-	ECVA	UTAD
Sónia Carabineiro	-	✓	FEUP	University of Porto
Elodie Rodrigues	-	✓	FEUP	University of Porto
Silvia Nunes	✓	-	ECVA	UTAD
Salomé Soares	-	✓	FEUP	University of Porto
Vera Santos	-	✓	FEUP	University of Porto

PhD Students	Equipment		Department Faculty	University Institution
	SEM/EDS	TEM		
Diana Gonçalves	✓	-	ECVA	UTAD
Cidália Teixeira	✓	-	ECT	UTAD
Tatiana Andreani	✓	-	ECVA	UTAD
Fábio Figueiras	✓	-	CICECO	University of Aveiro
Tânia Mendonça	✓	-	IFIMUP/FCUP	University of Porto
Javier Cruz	✓	-	INESC-Porto	University of Porto
Mariana Fernandes	✓	✓	ECVA	UTAD
Teresa Carvalho	✓	✓	ECVA	UTAD
Sílvia Bettencourt	-	✓	ECAV	UTAD
Clara Pereira	-	✓	FCUP	University of Porto
Célia Sousa	-	✓	FCUP	University of Porto
Yonni Romaguera	✓	-	INESC-Porto	University of Porto
Bárbara Machado	✓	-	ECVA	UTAD

MSc Students	Equipment SEM/EDS	Department Faculty	University Institution
Lisa Martins	✓	ECVA	UTAD
Rui Coelho	✓	ECT	UTAD
Fábio Pereira	✓	ECT	UTAD
João Belo	✓	FCUP	University of Porto

BSc / Licence Students	Equipment SEM/EDS	Department Faculty	University Institution
Mariana Vilas Boas	✓	ECVA	UTAD
Diogo Constante	✓	ECVA	UTAD
Marita Cardoso	✓	ECVA	UTAD

ECVA – Escola de Ciências da Vida e do Ambiente da UTAD (Life and Environmental Science College of UTAD)
 ECAV – Escola de Ciências Agrárias e Veterinárias da UTAD (Agronomic and Veterinary Science College of UTAD)
 ECT - Escola de Ciências e Tecnologia da UTAD (Science and Technology College of UTAD)
 FEUP- Engineering Faculty of University of Porto
 FCUP- Sciences Faculty of University of Porto
 INESC-Porto- Institute for Systems and computer Engineering of Porto
 CICECO- Centre for Research in Ceramics and Composite Materials of University of Aveiro

Public and private companies (Industry and Services)	Equipment SEM/EDS
Corticeiras Amorim	✓
MFLabquímico	✓
E.S. Lousada (Project support and publication " <i>Pathology of the rock monuments of Lousada</i> ", Micro-project Living Science No. 193)	✓
Nutroton	✓

4.2 Publications generated or with reference to electron microscopy experiments made in this Pole of the RNME.

4.2.1. Patents

⇒ *Catalisadores de ligas de paládio para cátodos de pilhas de combustível e respectivo método de produção*. Patente de invenção nacional nº 105193; ref. DMP/01/2010/264191.

4.2.2. SCI Articles

⇒ Carabineiro, S.A.C., Silva, A.M.T., Drazic, G., Tavares, P.B. and Figueiredo, J.L., "*Effect of chloride on the sinterization of Au/CeO₂ catalysts*", *Catalysis Today* **154**, 293-302, 2010.

⇒ Carabineiro, S.A.C., Silva, A.M.T., Drazic, G., Tavares, P.B., "*Gold nanoparticles on ceria supports for the oxidation of carbon monoxide*", *Catalysis Today* **154**, 21-30, 2010.

⇒ Gomes, M. E. P., Antunes, I.M.H.R.; Silva, P.B.; Neiva, A. M.R e Pacheco, F.A.L. (2010) "*Geochemistry of waters associated with the old mine workings at Fonte Santa (NE of Portugal)*". *Journal of Geochemical Exploration* Vol. 105, Issue 3, 153-165.

⇒ Gomes, M. E. P., Neves, L.; Coelho, F.; Carvalho, A.; Sousa, M. E Pereira,A. (2010) - "*Geochemistry of granites and metasediments of the urban area of Vila Real (Northern Portugal) and correlative radon risk*". *Environ Earth Sci* DOI 10.1007/s12665-010-0873-z.

⇒ Gonçalves, M.C., Bermudez, V.D., Silva, M.M., Smith, M.J., Morales, E., Ferreira, R.A.S., Carlos, L.D., "*Structure, thermal properties, conductivity and electrochemical stability of di-urethanesil hybrids doped with LiCF₃SO₃*", *Ionics* **16**, 193-201, 2010.

⇒ J. Agostinho Moreira, A. Almeida, W.S. Ferreira, M.R. Chaves, S.M.F.. Vilela, P.B. Tavares, B. Kundys, R. Ranjith, W. Prellier, (2010) "Effect of the external

- fields on the polar and dielectric properties of $\text{Eu}_{0.8}\text{Y}_{0.2}\text{MnO}_3$ ”, *Journal of Applied Physics* **107**, 024108.
- ⇒ J. Agostinho Moreira, A. Almeida, W. S. Ferreira, P.B. Tavares, S.M.F. Vilela (2010) Coupling between phonons and magnetic excitations in orthorhombic $\text{Eu}_{1-x}\text{Y}_x\text{MnO}_3$, *Phys. Rev. B* **81**, 054447 [12 pages].
- ⇒ J.A. Moreira; A. Almeida; W.S. Ferreira; M.R. Chaves; J. Oliveira; J. M. da Silva; Maria Sá; S.M.F. Vilela; **P.B. Tavares** (2010) Structure and physical properties of $\text{Eu}_{0.8}\text{Y}_{0.2}\text{MnO}_3$ ceramics, *Journal of Electroceramics* **25**, pp. 203–211.
- ⇒ Mishra, G.S., Kumar, A., Mukhopadhyay, S., Tavares, P.B., “*Novel alkoxysilane pentacoordinate O=V(IV) complexes as supported catalysts for cyclohexane oxidation with dioxygen*”, *Applied Catalysis A- General* **384**, 136-46, 2010.
- ⇒ Moreira, J.A., Almeida, A., Ferreira, W.S., Araújo, J.P., Pereira, A.M., Chaves, M.R., Costa, M.M.R., Khomchenko, V.A., Kreisel, J., Chernyshov, D. Vilela, S.M.F., Tavares, P.B., “*Strong magnetoelastic coupling in orthorhombic $\text{Eu}_{1-x}\text{Y}_x\text{MnO}_3$ manganite*”, *Physical Review* **82**, nº 094418, 2010.
- ⇒ Moreira, J.A., Almeida, A., Ferreira, W.S., Araújo, J.P., Pereira, A.M., Chaves, M.R., Kreisel, J., Vilela, S.M.F., Tavares, P.B., “*Coupling between phonons and magnetic excitations in orthorhombic $\text{Eu}_{1-x}\text{Y}_x\text{MnO}_3$* ”, *Physical Review B* **81**, nº054447, 2010.
- ⇒ Moreira, J.A., Almeida, A., Ferreira, W.S., Chaves, M.R., Araújo, J.P., Pereira, A.M., Vilela, S.M.F., Tavares, P.B., “*Polar properties and phase sequence in $\text{Eu}_{0.8}\text{Y}_{0.2}\text{MnO}_3$* ”, *Journal of Physics- Condensed Matter* **22**, nº125901, 2010.
- ⇒ Moreira, J.A., Almeida, A., Ferreira, W.S., Chaves, M.R., Vilela, S.M.F., Tavares, P.B., Kundys, B., Ranjith, R., Prellier, W., “*Effect of the external fields on the polar and dielectric properties of $\text{Eu}_{0.8}\text{Y}_{0.2}\text{MnO}_3$* ”, *Journal of Applied Physics* **107**, nº024108, 2010.
- ⇒ Oliveira, M. C., Fernandes, L. S., Tavares, P. B., Rego, R. (2010) - *Evaluation of the catalytic activity of Pd-Ag alloys for ethanol oxidation and oxygen reduction reaction*, *Journal of Power Sources* (accepted with minor revisions).
- ⇒ Pereira, C., Pereira, A., Quaresma, P., Tavares, P.B., Pereira, E., Araújo, J.P. and Freire, C., “*Superparamagnetic gamma- Fe_2O_3 @ SiO_2 nanoparticles: a novel support for the immobilization of $[\text{VO}(\text{acac})_2]$* ”, *The Royal Society of Chemistry, Dalton Trans.* **39**, 2842–54, 2010.
- ⇒ Rego, R., Oliveira, M. C., Velázquez, A., Cabot, P., “*A new route to prepare carbon paper-supported Pd catalyst for oxygen reduction reaction*”, *Electrochemistry Communications* **12**, 745–748, 2010.
- ⇒ S.A.C. Carabineiro, N. Bogdanchikova, M. Avalos-Borja, A. Pestryakov, P.B. Tavares, J.L. Figueiredo, *Gold supported on metal oxides for carbon monoxide oxidation*, *NanoResearch*, in press (DOI10.1007/s12274-010-0068-7)

- ⇒ Santos, V.P., Carabineiro, S.A.C., Tavares, P.B., Pereira, M.F.R., Orfão, J.J.M. and Figueiredo, J.L., “Oxidation of CO, ethanol and toluene over TiO₂ supported noble metal catalysts”, *Applied Catalysis B-Environmental* **99**, 198-205, 2010
- ⇒ Silva, B.; Correia, J.; Nunes, F.; Tavares, P.; Varum, H.; Pinto, J. (2010) - Bird Nest Construction: Lessons for Building with Earth - *Journal WSEAS Transactions on Environment and Development*, ISSN 1790-5079, Issue 2, Vol. 6, February 2010, 95-104.
- ⇒ Sonia A. C. Carabineiro, Nina Bogdanchikova, Miguel Avalos-Borja, Alexey Pestryakov, Pedro B. Tavares, Jose L. Figueiredo (2010) “Gold Supported on Metal Oxides for Carbon Monoxide Oxidation” *Nano Research* DOI 10.1007/s12274-010-0068-7 (p. 1-19).
- ⇒ T. M. Mendonça, A. M. L. Lopes, J. N. Gonçalves, J. G. Correia, P. B. Tavares, V. S. Amaral, C. Darie, J.P. Araujo (2010) “Perturbed angular correlations investigations on YMnO₃ multiferroic manganite”, *Hyperfine Interact*, DOI 10.1007/s10751-010-0233-0, Published online 8 Dez 2010.
- ⇒ V. Goiana, S. Kamba, C. Kadlec, D. Nuzhnyy, P. Kuzel, J. Agostinho Moreira, A. Almeida, P.B. Tavares, (2010) “THz and infrared studies of multiferroic hexagonal Y_{1-x}Eu_xMnO₃ (x=0–0.2) ceramics”, *Phase Transitions* **83** (10–11) pp.931–941.

4.2.3 Books or Book chapters

- ⇒ Gomes, M. E., Neiva, A. M.R. (2010) - *Petrologia e geoquímica dos granitóides de Rebordelo-Murçós-Torre da D. Chama e implicações metalogenéticas para Sn e W*. In: Cotelos Neiva, J. M.; Ribeiro, A.; Victor, L. M.; Noronha, F.; Ramalho, M. M.(Eds) – *Ciências Geológicas: Ensino, Investigação e sua História*. 1ª Edição: Associação Portuguesa de Geólogos. ISBN 978-989-96669-0-0. pp. 225-235

4.2.4. Proceedings

- ⇒ A. Cepeda, A. Murta, J. Lousada, J. Vieira, J. Pinto, L. Fernandes, P. Tavares, P. Silva and H. Varum– “*Tabique construction in Alto Tâmega*”. CD-ROM of full papers of the 1st International Conference on Structures and Architecture (ICSA2010). Ed. Paulo Cruz. CRC Press, Taylor & Francis Group. London. ISBN 978-0-415-49249-2. pp. 1403-1410, 2010.
- ⇒ A. Cepeda, J. Lousada, J. Vieira, H. Varum, P. Tavares, L. Fernandes, J. Pinto (2010) – “*Estudo do material terra aplicado na construção de tabique existente no Alto Tâmega*” -Proceedings do 6º Seminário Arquitectura de Terra em Portugal (6º ATP) e 9º Seminário Ibero-Americano de Arquitectura e Construção com Terra (9º SIACOT). Editado em CD. 20 - 23 February, University of Coimbra. Coimbra. Portugal. 2010.

- ⇒ C. Gonçalves, J. Pinto, J. Vieira, P. Silva, A. Paiva, L. Ramos, P. Tavares, L. Fernandes, J. Lousada, H. Varum (2010) – “*Tabique construction in the Municipalities Association of the Terra Quente Transmontana*”. Latest Trends on Cultural Heritage and Tourism. 3rd WSEAS International Conference on Cultural Heritage and Tourism (CUHT `10). Corfu Island. Greece. July 22-24, 2010. Editors: V. Miadenov and Z. Bojkovic. Published by WSEAS Press. ISSN: 1792-4308. ISBN: 978-960-474-205-9. pp. 235-240. Also available in CD-ROM: Proceedings of WSEAS International Conferences. Corfu Island. Greece. July 22-24, 2010. WSEAS Multiconference. Editors: N. Mastorakis, V. Miadenov, Z. Bojkovic, P. Dondon, O. Martin, X. Zheng, M. Jha, Z. Bojkovic. Associate Editors: V. Vasek, D. Simian, N. Bardie, G. R. Gillich, R. Cermak. ISSN: 1792-4291. ISBN: 978-960-474-206-6.
- ⇒ M. Fernandes, X. Cattoën, V. de Zea Bermudez, M. Wong Chi Man “*Solvent-controlled morphology of lamellar silsesquioxanes: from platelets to microsponges*”, CrystEngComm, DOI:10.1039/C0CE00385A.

4.2.5. Communications (oral and poster)

- ⇒ A. Cepeda, A. Murta, J. Lousada, J. Vieira, J. Pinto, L. Fernandes, P. Tavares, P. Silva & H. Varum, “ *Tabique construction in Alto Tâmega*”, 1st International Conference on Structures and Architecture (ICSA), 21-23 July, Guimarães, Portugal, 2010 (abstract submission to oral communication).
- ⇒ A. Cardoso, M. Fernandes, L. C. Rodrigues, M. M. Silva, V. de Zea Bermudez “*Protic ionic liquid-based anhydrous proton conducting di-ureasil hybrid electrolytes*”, XI International Symposium on Polymer Electrolytes (ISPE11) / Agosto 2010 / Padova- Itália.
- ⇒ Antunes, I.M.H.R.; Gomes, M.E. P.; Neiva, A.M.R. e Teixeira, R.J.. Contamination of waters related to abandoned W-Sn mines(Murçós, NE Portugal). *Abstracts of Goldschmidt Conference – Geochimica et Cosmochimica Acta, Vol. 74, Issue 12, Supplement 1* (p. A27), 2010 (poster).
- ⇒ Belini, U. L., Tomazello Filho, M., Leite, M. K., Chagas, M. P., Louzada, J.L.P.C., *Análise elementar de fibras de Eucalyptus grandis: sistema MEV-EDS*. VI Simpósio de Pós-graduação em Ciências Florestais e II Simpósio de Ciência e Tecnologia da Madeira do Rio de Janeiro, 2010, Rio de Janeiro. Anais II SIMADERJ, 2010.
- ⇒ Belini, U. L., Tomazello Filho, M., Louzada, J.L.P.C., Rodrigues, J.C., *Aspectos anatômicos e tecnológicos de painéis confeccionados com fibras de eucalipto e cana-de-açúcar*. CERNE (UFLA), Lavras - MG, v. 16, p. 48-52, 2010.
- ⇒ C. Fernandes, M. Rocha, R. Mendes, J. B. Horta, L. S. G. Fernandes, C. Pereira, A. M. Pereira, P. B. Tavares, J. P. Araújo e C. Freire, “*Spinel-Type Ferrite Nanoparticles: Synthesis and Magnetic Properties*”, 3rd Meeting of Young Researchers of U. Porto’10, 17-19 February, 2010 (poster).

- ⇒ C. Fernandes, M. Rocha, R. Mendes, J. B. Horta, L. S. G. Fernandes, A. S. Silva, C. Pereira, A. M. Pereira, P. B. Tavares, D. S. Schmool, J. P. Araújo, C. Freire, “*Cobalt(II) ferrite magnetic nanoparticles: synthesis and characterization*”, XVI Encontro Luso-Galego de Química, Aveiro, Portugal, November 2010.
- ⇒ C. Gonçalves, J. Martinho, J. Pinto, J. Vieira, P. Silva, P. Tavares, L. Fernandes, J. Lousada, H. Varum. “*Construção de tabique nas Associações de Municípios da Terra Fria do Nordeste Transmontano e da Terra Quente Transmontana*”, 1^o Congresso Internacional da Habitação no Espaço Lusófono (CIHEL), 22-24 September, Instituto Universitário de Lisboa (ISCTE), Lisboa, Portugal, 2010 (abstract submission to oral communication).
- ⇒ C. Pereira, A. Monteiro, H. Gaspar, L.S.G. Fernandes, E. del Rio, A.M. Pereira, P.B. Tavares, G. Blanco, J.M. Pintado, J.P. Araújo, A.P. Carvalho, J. Pires, M.F.R. Pereira and C. Freire, “*From White to Black Hybrid Silica Nanocomposites*”, 3rd International Conference on Advanced Nano Materials, 12-15 September 2010, Agadir, Marocco (abstract submission to oral communication).
- ⇒ C. Pereira, C. Fernandes, M. Rocha, L.S.G. Fernandes, R. Mendes, J.B. Horta, A.M. Pereira, P.B. Tavares, G. Blanco, J.M. Pintado, J.P. Araújo, A.P. Carvalho and C. Freire. “*Magnetic Silica-Coated Ferrite Nanoparticles: Physicochemical Properties and Immobilization of Manganese(III) Complexes*”. Challenges in Physical Chemistry and Nanoscience (ISACS2), 13-16 July 2010, Budapest, Hungary (abstract submission to oral communication).
- ⇒ Carabineiro, S.A.C., Bogdanchikova, N., Pestryakov, A., Tavares, P.B., Fernandes, L.S.G., Figueiredo, J.L., “*Au nanoparticles on MgO for CO oxidation*”, 11th edition of Trends in Nanotechnology International Conference (TNT), September 6-10, Braga, Portugal, 2010 (abstract submission to oral communication).
- ⇒ Delfina B. Barros, C. Pereira, L. S. G. Fernandes, P. B. Tavares, A. Carneiro, M. F. R. Pereira e C. Freire, “*Synthesis of Silica Particles for Textile Applications*”, 3rd Meeting of Young Researchers of U. Porto, 17-19 February, 2010 (oral communication).
- ⇒ Gomes, M.E. P.; Antunes, I.M.H.R.; Neiva, A.M.R. e Teixeira, R.J.. *Mineralogical and geochemical characteristics of W>Sn quartz veins from Murçós (Northeastern Portugal)*. ACTA MINERALOGICA-PETROGRAPHICA. ABSTRACT SERIES, vol.6. EG50G– Economic geology (metallic and non-metallic ore deposits)– poster, pág. 233, 2010 (poster).
- ⇒ Gomes, M.E. P.G, Antunes, I.M.H.R.; Pacheco, F.A.L.; Neiva, A.M.R. e Silva, P.B.. *Weathering and hydrochemistry associated with the old mine workings at Fonte Santa (NE of Portugal)*. Abstracts of Goldschmidt Conference – Geochimica et Cosmochimica Acta, Vol. 74, Issue 12, Supplement 1 (p. A344), 2010 (poster).
- ⇒ J. Martinho, J. Pinto, J. Vieira, P. Silva, P. Tavares, L. Fernandes, J. Lousada, H. Varum. “*Tabique constructions in the Municipalities Association of Terra Fria do*

Nordeste Transmontano". VII Congresso Internacional de Arquitectura de Tierra Tradición e Innovación. Grupo Tierra de la Universidad de Valladolid. Valladolid. España. 25-26 September de 2010 (abstract submission to oral communication).

- ⇒ J. Pinto, A. Paiva, H. Varum, A. Costa, S. Pereira, L. Fernandes, P. Tavares, J. Agarwal. "*Corn's cob as a potential ecological thermal isolation material*", Encontro Nacional de Materiais e Estruturas Compósitas, ENMEC - FEUP, Porto, 6-8 of September, 2010 (poster).
- ⇒ L. C. Rodrigues, M. Fernandes, V. de Zea Bermudez, M. M. Silva, M. J. Smith "*Structural Studies of Novel Di-Ureasil ORMOLYTE Doped With Lithium Hexafluoroantimonate*", XI International Symposium on Polymer Electrolytes (ISPE11) / Agosto 2010 / Padova- Itália.
- ⇒ Lopes, G., Vaz, N., Sequeira, A. J. D., Piçarra, J. M., Fernandes, P. & Pereira, Z., *Palynomorphs from the Gorstian (Silurian) of Sazes Formation (Buçaco Syncline), Central Iberian Zone, Portugal – Preliminary results*, in Marzena Oliwkiewicz – Miklasinska, Marzena Stempień – Salek & Andrzej Laptas (Ed.). Abstracts of CIMP Poland 2010, General Meeting, Varsóvia, 2010.
- ⇒ Lopes, G., Vaz, N., Sequeira, A. J. D., Piçarra, J. M., Fernandes, P. & Pereira, Z., *Dados palinoestratigráficos preliminares do Gorstiano (Silúrico) da Formação de Sazes (Sinclinal do Buçaco)*. e-Terra (<http://e-terra.geopor.pt>) Volume 17, nº14 (VIII Congresso Nacional de Geologia), 2010.
- ⇒ M. Rocha, C. Fernandes, R. Mendes, J. B. Horta, L. S. G. Fernandes, C. Pereira, A. M. Pereira, P. B. Tavares, J. P. Araújo, C. Freire, "*Superparamagnetic magnetite nanoparticles: preparation and physicochemical characterization*", VI Encontro Luso-Galego de Química, Aveiro, Portugal, November 2010.
- ⇒ M. Salavessa, A. Shahsavandi, F. Torgal, S. Jalali, "*Causes of decay of the Aveleiras House decorative plasters (in Torre de Moncorvo)*", 2nd Historic Mortars Conference, 20-24 September, Prague (abstract submission to oral communication).
- ⇒ Mariana Fernandes, Xavier Cattoën, Verónica de Zea Bermudez, Michel Wong Chi Man, "*Solvent-controlled morphology of lamellar polysilsesquioxanes: from platelets to microsponges*", Journée Grand Sud-Ouest et de Catalogne, Montpellier, França, 26 de Novembro.
- ⇒ Martins, L.; Gomes, M.; Neves, L.; Sousa, L.; Oliveira, A. *Dados preliminares da radioactividade natural na região de Amarante (Norte de Portugal)*. Resumos do VIII Congresso Nacional de Geologia – e -Terra Revista Electrónica de Ciências da Terra, Vol. 13, nº 14. POSTER premiado na qualidade de jovens investigadores, 2010.
- ⇒ Oliveira, M. C., Rego, R., "*Electro-oxidation of alcohols on Pd-Ag alloys in alkaline medium*", XII Iberian meeting of electrochemistry, XVI meeting of the portuguese electrochemical society, Portugaliae Electrochimica Acta, 42,

- Lisboa, Portugal,, September 8-11, 2010 (abstract submission to oral communication).
- ⇒ Oliveira, M. C., Rego, R., *"Evaluation of Pd-Ag alloys as electrocatalysts for oxygen reduction reaction in alkaline media"*, extended abstracts of the 8th international symposium on new materials and nano-materials for electrochemical systems, 171, Shanghai, China, July 11-15, 2010 (abstract submission to oral communication).
- ⇒ Pinto, Jorge; Paiva, Anabela; Costa, Ana; Tavares, Pedro; Fernandes, Lisete; Murta, Antonio; Varum, Humberto, *'Building with sugar and corn'*, International Conference on Advances in Production Management Systems (APMS), 11-13 October, Cernobbio, Como, Italy, 2010 (poster).
- ⇒ Rego, R., Oliveira, M. C., *"A novel procedure on the preparation of the catalyst layer, Progress in MEA materials for medium and high temperature polymer electrolyte fuel cells"*, 110, La Grande Motte, France, September 19-22, 2010 (abstract submission to oral communication).
- ⇒ Rego, R., Oliveira, M. C., *"Preparation of nanomaterials supported on a carbon paper/Teflon substrate - Application as electrocatalyst for fuel cells"*, the 4th International Meeting on Developments in Materials, Processes and Applications of Emerging Technologies (MPA), 185-186 (MPA284), Braga, Portugal, July 28-30, 2010 (abstract submission to oral communication).
- ⇒ Rego, R., Oliveira, M. C., Rego, A., *"Carbon paper-supported Pd nano-materials for the oxygen reduction reaction"*, XII Iberian meeting of electrochemistry, XVI meeting of the portuguese electrochemical society, Portugaliae Electrochimica Acta, pag 80, Lisboa, Portugal, September 8-11, 2010 (abstract submission to oral communication).
- ⇒ Rego, R., Oliveira, M. C., Rego, A., *"Development of Pd-P nano electrocatalysts for oxygen reduction reaction"*, extended abstracts of the 8th international symposium on new materials and nano-materials for electrochemical systems, 77, Shanghai, China, July 11-15, 2010 (abstract submission to oral communication).
- ⇒ S.A.C. Carabineiro, N. Bogdanchikova, P.B. Tavares, L.S.G. Fernandes, J.L. Figueiredo, *Nanostructured iron oxides as supports for gold nanoparticles*, NANOSMAT-5 - 5th International Conference on Surfaces, Coatings and Nano-Structured Materials, Reims, France, 2010 (poster).
- ⇒ S.A.C. Carabineiro, P.B. Tavares, J.L. Figueiredo, *"Nanoparticles of gold on mixed -alumina supports"*, NANOSMAT-5 - 5th International Conference on Surfaces, Coatings and Nano-Structured Materials, Reims, France, 2010 (poster).
- ⇒ T. Andreani, A. L. R. Souza, A. M. Silva, C. L. Martins, E. B. Souto, *"Effects of mixing mode on the formation of Sílica Nanoparticles synthesized via aqueous sol-gel process"*, 8th Central European Symposium on Pharmaceutical Technology- Graz, Austria- 16-19 of September, 2010 (poster).

- ⇒ T. T. Carvalho, P. B. Tavares, J. R. Fernandes, J. Perez Cruz, A. M. Pereira, J. Agostinho Moreira “Effect of annealing treatments on electric and magnetic properties of Bi_{0.9}La_{0.1}Fe_{0.9}Mn_{0.1}O₃ films deposited by RF sputtering” EMRS Fall Meeting 2010, 13 a 17 de Setembro de 2010, Varsóvia, Polónia (Poster).
- ⇒ T. T. Carvalho, P. B. Tavares, J. R. Fernandes, J. Perez Cruz, A. M. Pereira, J. Agostinho Moreira “Magnetic properties of Bi_{0.9}La_{0.1}Fe_{0.9}Mn_{0.1}O₃ films grown by RF sputtering” Summer school of multiferroics 2010, 27 a 1 de Outubro de 2010, L'aquila, Itália (Poster).
- ⇒ T. T. Carvalho, P. B. Tavares, J. R. Fernandes, J. Perez Cruz, A.M. Pereira, J. Agostinho Moreira, “*Deposition of (BiLa)(FeMn)O₃ thin films by RF sputtering*”, Física 2010, 1 a 3 de Setembro, Vila Real, Portugal, 2010.
- ⇒ Teixeira, J. C. S., Fernandes, M., Bermudez, V.D., Barbosa, P.C., Rodrigues, L.C., Silva, M.M., Smith, M.J., “*Mg²⁺-doped poly(epsilon-caprolactone)/siloxane biohybrids*”, 11th International Symposium on Polymer Electrolytes, Aug 31-Sep 05, 2008, Ofir, Portugal, Electrochimica Acta 55, Special Issue 1328-32, 2010.
- ⇒ Vaz, N., Paris, F. & Oliveira, J. T., *Chitinozoans of upper Silurian of Amêndoa-Mação Syncline*, in Marzena Oliwkiewicz – Miklasinska, Marzena Stempien – Salek & Andrzej Laptas (Ed.). Abstracts of CIMP Poland 2010, General Meeting, Varsóvia, 2010.
- ⇒ Vaz, N., Paris, F. & Oliveira, J. T., *Quitinozoários do Silúrico superior do Sinclinal Amêndoa Mação*. e-Terra (<http://e-terra.geopor.pt>) Volume 17, nº17 (VIII Congresso Nacional de Geologia), 2010.
- ⇒ Vaz, N., Paris, F. & Oliveira, J. T., *Quitinozoários da Formação Ribeira da Laje, Sinclinal Amêndoa Mação (Ordovícico Superior, Portugal)*. e-Terra (<http://e-terra.geopor.pt>) Volume 17, nº19 (VIII Congresso Nacional de Geologia), 2010.

4.2.6. Theses

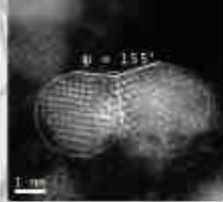
- ⇒ Alice Vilela-Moura. *Isolation and characterization of yeasts: application in controlled processes of volatile acidity bio-reduction in wines*. PhD thesis, UTAD, 160 pags, 2010.
- ⇒ Carlos Eduardo Vinhas Fernandes. *Nanopartículas de ferrite de cobalto(II): Síntese e caracterização*, Graduation Project in Chemistry, Faculdade de Ciências da Universidade do Porto, September 2010.
- ⇒ Cidália Teixeira, *Avaliação do Potencial de ligantes à base de sódio e cinzas volantes na estabilização de solos-comparação com soluções tradicionais*. Master thesis, Civil Eng., UTAD, 2010.
- ⇒ Delfina Celeste Brandão Barros. *Síntese de Materiais para Isolamento Térmico*, Master thesis in Chemistry, Faculdade de Ciências da Universidade do Porto, December 2010.

- ⇒ João Horta Belo, "*R₅(Si_xGe_{1-x})₄ Magnetocaloric Materials: Phase-Controlled Synthesis and Atomic Studies*", Master thesis in Chemistry, Faculdade de Ciências da Universidade do Porto, November 2010.
- ⇒ Lisa Martins, *Radioactividade Natural na Região de Amarante*. Master thesis UTAD, 25 November 2010.
- ⇒ Maria Carpinteiro de Barros Martins, "*Estudo Morfo-Anatómico de Três Espécies Produtoras de Corantes Naturais*". Master thesis in Biology and Geology, UTAD, 2010.
- ⇒ Mariana Raquel Maia da Rocha. *Nanopartículas de Magnetite: Síntese e Caracterização*, Graduation Project in Chemistry, Faculdade de Ciências da Universidade do Porto, September 2010.

5. Other activities.

Photography exposition "*Five years of Electronic Microscopy in UTAD*", started at 29th of June, 2010 with 64 photos of SEM and TEM.

A one day **TEM course** in July 2010 was given by Professor Paulo Ferreira, with 25 participants. During the course, an interactive contest was made to elect the best 5 pictures of the exposition "*Five years of Electronic Microscopy in UTAD*".

 Medida do ângulo diedro entre duas nano-partículas de platina M.A. Gomes, D. Kolar, Y. Zhao-Hong, L. F. Alard, F. J. Pereira, <i>Nanotechnology</i> 21 (2010) 025701	 Universidade de Trás-os-Montes e Alto Douro Fundação Rei D. Dinis UNIDADE DE MICROSCOPIA ELECTRÓNICA unee@utad.pt http://home.utad.pt/~unee Telefone: +351 258 350 801 Fax: +351 258 350 400	 UNIDADE DE MICROSCOPIA ELECTRÓNICA 5º CURSO DE MICROSCOPIA ELECTRÓNICA MICROSCOPIA ELECTRÓNICA DE TRANSMISSÃO (Análise de materiais em TEM) 13 de Julho de 2010
OBJECTIVOS - As potencialidades da Microscopia Electrónica de Transmissão na investigação de materiais; - Recentes inovações em Microscopia Electrónica de Transmissão; - Imagem por energia filtrada; - Correção da aberração esférica, C_s; - Correção da aberração cromática, C_c; - Detecção HAADF em modo STEM.	5º CURSO DE MICROSCOPIA ELECTRÓNICA 13 de Julho de 2010 14:30 Auditório do Edifício de Ciências Florestais Universidade de Trás-os-Montes e Alto Douro	Convidado Prof. Dr. Paulo Ferreira (U. Texas @ Austin) 
	Organização Prof.ª Dr.ª Ana Maria Nazare Pereira Prof. Dr. Pedro Bandeira Tavares Prof.ª Dr.ª Maria Cristina Oliveira Prof.ª Dr.ª Paula Lúcia Silva Dr.ª Ueslei Fernandes	



A Unidade de Microscopia Electrónica

A UNIDADE DE MICROSCÓPIA ELECTRÓNICA (UMEC) é uma infraestrutura da Universidade de Trás-os-Montes e Alto Douro (UTAD) aliada à Fundação Calisto Tanzi.

O funcionamento da UME visa apoiar a investigação e desenvolvimento e a formação académica e técnica dos investigadores dos diversos Centros de Investigação e Departamentos da UTAD, de outras Universidades e de instituições públicas e privadas. Pode igualmente prestar serviços, gerando um novo desenvolvimento tecnológico da região transmontana. Também é objectivo da UME a formação contínua de alunos de ensino superior e a prestação de intervenções técnicas aos alunos de ensino secundário, através da utilização de aulas de formação e de demonstração.

A UME tem vindo a desenvolver trabalhos com os diversos Centros de Investigação da UTAD e em parceria com outras instituições e investigadores. Para o FCT e FEUP, o IIRN, o IIRN, o IIRN, o IIRN e o IIRN, entre outros. Os materiais analisados incluem sistemas biológicos e não biológicos. Presta também serviços a empresas, como a Comarca Agrária e ao Laboratório (reprodutível).

A UME dispõe actualmente de um Microscópio Electrónico de Transmissão (TEM), um Microscópio Electrónico de Varredura por Raios Secundários (SEM-ESEM), detector para análise química elementar (EDS) e equipamento complementar para preparação de amostras ultramicroscópicas, repositório de software e equipamento de apoio.

A UME dispõe ainda de um técnico/auxiliar de laboratório (ATL), apoiado pelo Centro de Química da UTAD.

Programa (13/Jul/2010)

14:30 - Sessão de
(Inf. das Ciências Florestais)
Lecturado pelo Professor Dr. Paulo Ferreira da Universidade do Texas em Austin.

16:30 Laboratório de UME
(Case do Ed. das Ciências Florestais)
Preparação e observação de nanopartículas.



Paulo Jorge Ferreira nasceu em Porto, Portugal. Licenciou-se na Universidade do Porto, em Engenharia do Metal. É doutorado em Ciências das Matérias pela Universidade de Illinois, E.U.A.

Acedeu ao professor adjunto na Faculdade de Engenharia da Universidade do Texas em Austin. Concluiu a sua investigação científica nas áreas de Nanotecnologia, Nanotecnologia e Microscopia Electrónica. No mesmo período concluiu a sua graduação em Ciências das Matérias com o grau de Mestre em Nanotecnologia sendo o Coordenador Adjunto do Programa de Pós-Graduação em Ciências de Matéria da Universidade do Texas em Austin. É consultor do Centro de Química da UTAD para a área de Química das Matérias.

Admissão
O curso destina-se a docentes, investigadores e alunos de 1.º, 2.º e 3.º ciclos, interessados em adquirir conhecimentos sobre as possibilidades que o TEM oferece para investigação em materiais.

Em virtude do carácter próximo de 2.º ano, a organização reserva o direito de limitar as inscrições, de organizar grupos de trabalho.

Formulário de inscrição

Estudantes 1.º, 2.º e 3.º ciclos: 20 Euros;
Público em geral: 30 Euros

Nome completo _____

Matrícula (se aplicável) _____

Preferencialmente inscrição por e-mail, para: ume@utad.pt

O pagamento poderá ser efectuado por cheque enviado a: Centro de Formação, Rua D. Dinis, 1, 5.º andar, 5000-001 Vila Real, Portugal. Ou directamente no cartão de crédito e RIB: 0007 0000 0000 0000 0000 0000. Guardar o comprovativo enviado para o e-mail.

1.º CURSO DE MICROSCÓPIA ELECTRÓNICA
MICROSCÓPIA ELECTRÓNICA DE TRANSMISSÃO
(Análise de materiais em TEM)
13 de Julho de 2010 (14:30)

Universidade de Trás-os-Montes e Alto Douro
Parque da UTAD, Vila Real
Unidade de Microscopia Electrónica
Rua das Ciências, 5000-001 Vila Real
Tel: +351 259 350 500
Fax: +351 259 350 400
www.utad.pt

6. Analysis of activity progress with reference to planning, and strategies for improvement.

The functioning of the UME laboratory is dependent on the services payment and on the FCT contribution. Maintenance contracts are very expensive (6500 Euros/year for SEM and 9000 Euros/year for TEM) and UME cannot afford it in a regular base. Most of the regular maintenance is made by UME technical staff.

Despite the good functioning of the laboratory, we would like to emphasize the time consuming of TEM photos by conventional process. Due to the fact that our equipment has a sheet-film camera, all the images from TEM have a slow process from the time of analysis until the emission of results to the user. In addition the sheet films are very expensive (270 Euros a box of 100 sheets) and we have increasing acquisition difficulties because Kodak is expected to stop production in 2/3 years. The budget needed for acquisition of a digital camera is 43 000€, but it will be a worthy investment to improvement of our services so, it is in our near objectives.