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## Foreword

Instituto de Engenharia de Estruturas, Território e Construção (ICIST) is a research unit within Instituto Superior Técnico financed by FCT (Fundação para a Ciência e a Tecnologia), the Portuguese governmental research agency. It was founded in 1995 (evolving from CMEST, founded in 1981) and is the largest research center in Civil Engineering and associated areas in Portugal, with 101 PhD and more than 80 non-PhD researchers.

The goal of ICIST is to develop scientific and technological research, promoting innovation and development, scientific dissemination and consulting in the areas of its six Research Groups:

- Earthquake Engineering and Seismology
- Mechanics, Modeling and Analysis of Structures
- Studies on Construction
- Structural Design and Geotechnics
- Information and Design Support Systems
- Architecture

The Centre is committed to the advancement of knowledge in these areas, through the development of both basic and applied research. Members of the Centre are engaged in a large number of research activities, as the numbers of the period 2007-2011 demonstrate: 311 papers in ISI or Scopus journals, 93 in

national peer-reviewed journals, 731 articles in international conferences, 350 in national conferences, 11 books, 37 book editions, 106 book chapters, 71 PhD theses (and 112 ongoing in 2012) and 678 MSc dissertations (and 172 ongoing).

One of the goals of this newsletter is to inform ICIST researchers, collaborators, students and the general public of the most significant activity developed at the Centre, giving an insight on the scientific, technologic, economical and social impacts of the research developed by ICIST members.

The newsletter, issued twice a year, includes sections on each of ICIST's major activity areas: scientific and technological research (highlighting the most relevant publications and projects), doctoral theses and consultancy. Other useful information, such as upcoming events involving ICIST members, is also included.

This first edition aims at informing the general audience about the activity of ICIST during 2011. I hope you find it useful to get acquainted with the activities developed at our Centre.

Jorge de Brito, President of ICIST

## Research Projects Awarded in 2011

IST is leading the Portuguese group participating in the UPStrat-MAFA Project which will start in January 2012 and will last for 2 years. UPStrat-MAFA is a FP7 Project dealing with "Urban Disaster Prevention Strategies Using Macroseismic Fields and Fault Sources". Prof. Carlos Sousa Oliveira is the Portuguese Coordinator and the participation in the Project involves several work packages.

FCT project PTDC/CTE-GIX/116819/2010 – AQUAREL - Accurate QUAntification of Regional Earthquakes and Earth structure: appLication to Western Iberia; Principal Investigator is Ana Margarida Godinho Ferreira.

FCT project PTDC/ECM/117774/2010 – Recycling & Seismic Protection: Sustainable High Performance CFST Columns for Seismic Areas; Principal Investigator is Nuno Silvestre.

FCT Project PTDC/ECM/1128372/2010 – EXELlent SUSTainable CONcrete - High Performance Recycled Aggregates Concrete for the Precasting Industry (2012-2015); ICIST coordinator is Jorge de Brito.

FCT Project PTDC/ECM/118271/2010 – Fire Protection of Reinforced Concrete Structural Elements Strengthened with CFRP Composite Systems (2012-2015); ICIST coordinator is João Ramôa Correia.

QREN Project 06/SI/2010 – Tomography and rehabilitation of concrete structures) (2011-2013); ICIST coordinator is Fernando Branco

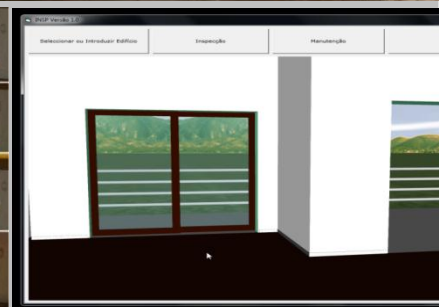
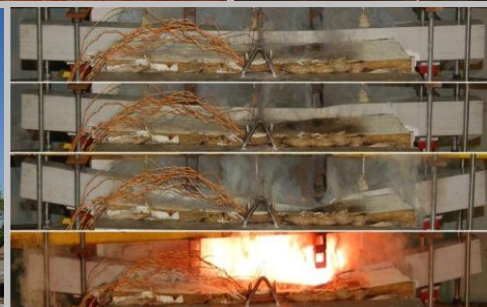
FCT Project PTDC/ECM/118262/2010 – NANORENDER - Performance of silica nanoaerogel-based renders (2012-2015); ICIST coordinator is Inês Flores-Colen.

FCT Project PTDC/ECM/119214/2010– MesoCrete - Concrete Behaviour at Meso-Scale; ICIST coordinator is Eduardo Júlio.

QREN Project 18538 – Mobiliário Urbano em UHPFRLWAC; ICIST coordinator is Eduardo Júlio.

FCT Project PTDC/ECM/122751/2010 – WaveSoil - Innovative seismic wave-based tools for the characterization of damping and anisotropy of soils in routine tests; ICIST participants are Jaime Santos, Isabel Lopes and Rui Gomes.

FCT Project PTDC/AUR-AQI/117305/2010 – PERIURBAN - Áreas peri-urbanas perante os desafios da sustentabilidade: desenvolvimento de cenários para a AML; ICIST participant is Alexandre Gonçalves.



## Announcement of FCT calls

FCT (Fundação para a Ciência e Tecnologia) informs that the following calls in all scientific domains are open in 2012:

### 1. R&D PROJECTS

Calls open sequentially in four scientific areas:

- *Life and Health Sciences (15 February - 15 March)*
- *Exact Sciences and Engineering (1 March - 29 March)*
- *Natural Sciences and Environment (21 March - 19 April)*
- *Social Sciences and Humanities (3 April - 3 May 2012)*

This announcement of call for proposals comprises four action lines that are materialized in different typologies of projects that differ in terms of organizing scientific research and technological development (SR&TD) activities and in terms of size and need of mobilization of material resources and highly qualified human resources. The scientific research and technological development projects correspond to research projects addressing scientifically relevant and original issues with reference to international standards that foster the advancement of knowledge. The outcome of the calls will be available during the second semester of 2012 so that projects can start in January 2013. Four typologies of projects that can be funded:

#### SR&TD Projects

Research projects addressing scientifically relevant and original issues, with reference to international standards, that contribute significantly to the advancement of knowledge and produce identified outcomes within the duration of the project in terms of scientific production and taking into account the priority research areas defined by public policies. The duration of projects to be funded is two years renewable up to one year and the maximum funding per project is 200.000€.

#### Exploratory research projects

Research project configuration intended for the exploration of ideas or concepts considered as having great originality and/or innovative potential. The duration of projects to be funded is one year renewable up to six months and the maximum funding per project is 50.000€.

#### SR&TD Projects in research lines of excellence

Structured and coherent organization of the scientific activity in major lines of research. The scientific or technological goals shall be based upon clear expected indicators and supported in emerging areas and/or of excellence consolidation areas identified as priorities for the National Scientific and Technological System. These projects shall present a five-year scientific plan and the timeframe to the financial execution shall not exceed the three years duration of this call. The maximum funding per project is 500.000€. These projects require a significant dedication of the teams to its objectives and an investment of time of the Principal Investigator not less than 60% dedication to the project.

#### SR&TD Projects of consolidation of research skills and resources

Research projects that by their nature and specificity strongly depend on material resources and qualified human resources in order to develop competitive skills, particularly for international participation programs. These projects shall present a scientific five-year plan and the timetable for the financial execution shall not exceed the three years duration in this call. The maximum funding per project is 500.000€.

Applications must be submitted to FCT, in the appropriate electronic web application through <https://concursos.fct.mctes.pt/projectos/>

### 2. CONTRACTS FCT FOR RESEARCHERS (national call)

This call will allow PhD level researchers to apply for a 5-year supported by FCT. The selection process will evaluate the merit of the candidate and the quality of the scientific program. The call will be open between 6th March and 3rd April 2012. The outcome of the call will be available during the second semester of 2012 so as to allow contracts to initiate from October 2012.

### 3. FELLOWSHIPS

These Calls for Individual Doctoral and Post-doctoral Grants will be open between 2nd May and 28th June 2012. The individual applications must be submitted by electronic means, using the web application available at: <https://concursos.fct.mctes.pt/bolsas/>

## Completed Doctoral Theses

- Eduardo Fernandes: *The choice of Porto: contributions to the updating of an idea of school.* Supervisors: Jorge Correia, (UMinho), João Vieira Caldas (Feb. 9<sup>th</sup>)
- Carlos Araújo: *Analysis and design of prefabricated hollow core slabs.* Supervisor: José Câmara (Mar. 18<sup>th</sup>)
- Sónia Maria Costa e Silva: *The management of the maintenance activities in public buildings. Model and definition of strategies for a sustainable intervention.* Supervisors: Manuel Fonseca, Jorge de Brito (March 15<sup>th</sup>)
- José Alexandre de Brito Aleixo Bogas: *Characterization of structural lightweight expanded clay aggregate concrete.* Supervisor: Augusto Gomes (June 22<sup>nd</sup>)
- António José Brazão de Brito: *Design of reinforced concrete underground structures under seismic actions.* Supervisor: Mário Lopes (July 4<sup>th</sup>)
- Javier Fernando Camacho-Tauta: *Evaluation of the small-strain stiffness of soil by non-conventional dynamic testing methods.* Supervisors: Jaime Santos, António Fonseca (FEUP) (July 11<sup>th</sup>)
- Paulo José Simões Vaz Serra: *Knowledge Management in a Construction Company.* Supervisors: Francisco Loforte, Diogo Mendes (July 11<sup>th</sup>)
- Maria João de Brito Coelho: *Improvements to the surface wave method for geotechnical characterization.* Supervisors: Jaime Santos, Marília Pereira (LNEC) (July 15<sup>th</sup>)
- Nuno Gonçalo Marques de Almeida: *Framework for risk-managed performance-based buildings.* Supervisors: Luís Alves Dias, Fernando Branco (July 22<sup>nd</sup>)
- Mohamed Agwa: *Friction-induced dynamic instabilities and solution (non)-uniqueness in contact mechanics.* Supervisor: António Pinto da Costa (Sept. 15<sup>th</sup>)
- Luís Mendes: *Refined three-dimensional seismic analysis of reinforced concrete structures.* Supervisors: Ema Coelho (LNEC), Luís Castro (Oct. 11<sup>th</sup>)
- António Vilhena: *Method for buildings' maintenance condition assessment. Analysis and contributions for its improvement.* Supervisors: João Oliveira Pedro (LNEC), Jorge de Brito (Nov. 23<sup>rd</sup>)
- Maria Dulce Henriques: *Treatment and consolidation of degraded pine wood in structural elements of ancient buildings.* Supervisors: Lina Nunes (LNEC), Jorge de Brito (Nov. 24<sup>th</sup>)
- Mário Arruda: *Static and dynamic analysis of concrete structures using damage mechanics.* Supervisor: Luís Castro (Dec. 2<sup>nd</sup>)
- Carlos Cruz: *Essays on infrastructure public private partnerships: decision, development and management.* Supervisor: Rui Marques (IST) (Dec. 18<sup>th</sup>)
- António Aguiar Costa: *Social e-business: A new vision for construction e-procurement platforms.* Supervisors: Luís Valadares Tavares, José Antunes Ferreira (IST) (Dec. 19<sup>th</sup>)
- António Cabaço: *Procurement of construction projects. Analysis of traditional and non-traditional models and contribution to their improvement.* Supervisors: Armando Manso (LNEC), Jorge de Brito (Dec. 21<sup>st</sup>)
- António José dos Santos: *Development of a method for the dynamic characterisation of daylighting in mediterranean climates.* Supervisors: António Moret Rodrigues, Licínio de Carvalho (LNEC) (Dec. 21<sup>st</sup>)

## Upcoming Doctoral Theses

- Carlos Bhatt: *Seismic Assessment of Existing Buildings Using Nonlinear Static Procedures (NSPs) - A New 3D Pushover Procedure.* Supervisors: Rita Bento, Rui Moura Pinho (March 21<sup>st</sup>, 2012)
- Sara Eloy Freire da Cruz: *A Transformation Grammar-Based Methodology for Housing Rehabilitation: Meeting Contemporary Functional and ICT Requirements.* Supervisors: José Pinto Duarte, Renato Nunes, Maria Isabel Barbosa (April 27<sup>th</sup>, 2012)

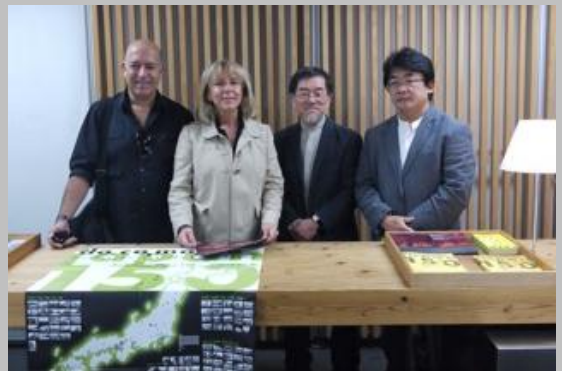
## ICIST News

- The UTL/Santander Totta Scientific Prizes, given by the Technical University of Lisbon in the scientific area of "*Civil Engineering, Mechanical Engineering, Naval Engineering, Mining and Geological Engineering, Aerospace Engineering, Territorial Engineering, Transportation, Biomechanics*" to encourage and reward the publication of scientific papers, were awarded in the 2011 edition to Jorge de Brito and Nuno Silvestre while Dinar Camotim was awarded a Honour Diploma.
- Dinar Camotim was awarded a Honour Diploma by Reitoria da Universidade Técnica de Lisboa.
- José Dinis Silvestre, collaborator of ICIST, was awarded a Honour Diploma in the UTL/Deloitte 2011 Researchers Prize.
- André Reis, a former student of Civil Engineering with a specialization in Geotechnics, was awarded the Young Portuguese Language Geotechnics Award 2011, by the Portuguese Geotechnics Society, with the work "*Comportamento Hidro-Mecânico de Solos Compactados com Diferente Teor em Água de Compactação*" developed in the scope of his MSc dissertation (supervisor: Rafaela Cardoso).
- PhD student João Pedro Firmo was awarded the IHRU Prize 2011 for the best MSc dissertation with the work "*Comportamento ao fogo de vigas de Betão Armado reforçadas à flexão com laminados de fibras de carbono - desenvolvimento de sistemas de protecção ao fogo*" (Supervisor: João Ramôa Correia).
- Luís Valarinho was awarded the Secil Universidades Engenharia Civil 2010 Award with the work "*Construção em vidro estrutural - comportamento estrutural de vigas mistas vidro-GFRP*".
- The Valorpneu Innovation Award 2011 has distinguished students Filipe Valadares and Miguel Bravo from the Civil Engineering MSc course, who developed the project "*Concrete with rubber from used tyres*" (Supervisor: Jorge de Brito)



Valorpneu Innovation Award 2011 ceremony

- The Best Student Paper Award of the Annual Conference of The International Emergency Management Society was awarded to Andreea Duțu, João Gomes Ferreira and Cristian Sandu, with their paper "*Seismic Risk Management of Civil Buildings in Romania Based on the Incremental Seismic Rehabilitation Concept*".

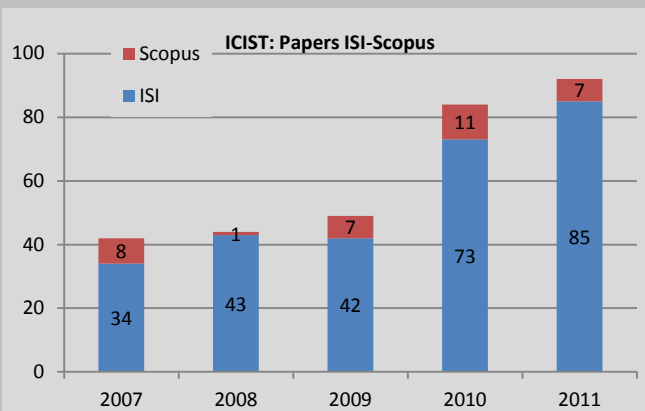


Inauguration of DOCOMOMO Japan exhibition "Future and Legacy 150", September 23, 2011: João Belo Rodeia (Portugal Ordem dos Arquitectos Chair), Ana Tostões (DOCOMOMO International Chair), Yoshinki Yamana and Koichiro Kanamatsu (DOCOMOMO Japan).

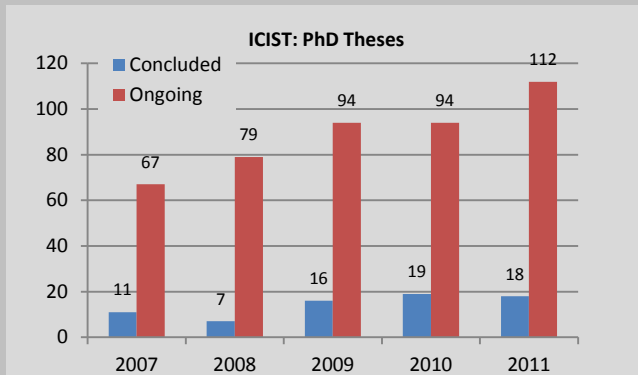
- Ana Tostões was nominated in February 2011 as President of DoCoMoMo International, a NGO based in the Mies van der Rohe Foundation in Barcelona and founded in 1988, working closely with the International Union of Architects and UNESCO. DoCoMoMo is responsible for documenting buildings and places of the Modernist era and has 55 workgroups and more than 2000 members worldwide.

## Statistics in 2011

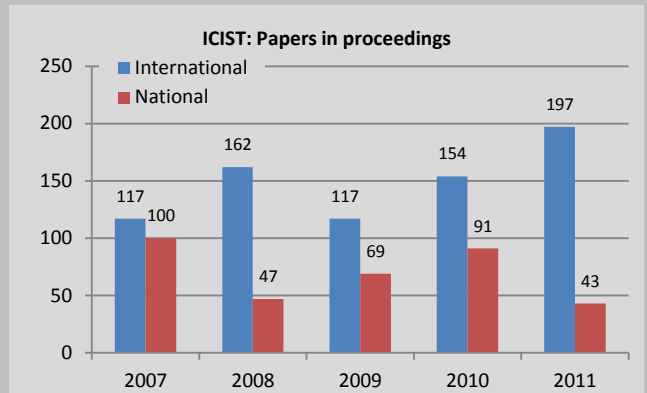
- The number of PhD members in ICIST has risen to 105 in 2012, continuing the trend of the last decade.
- The number of eligible members has risen to 60 in 2012, also continuing a trend started in 2010.
- The number of published ISI or Scopus papers has topped to 92 in 2011, 85 of which in ISI journals.



- The number of concluded doctoral theses in 2011 was 18. For the fourth year in a row all the research groups had theses completed. The number of ongoing doctoral theses as of January 2012 is 112, the largest ever in ICIST's history.



- The number of concluded and ongoing Master dissertations was practically the same as in 2010, (128 concluded and 172 ongoing).
- The dissemination of research results has a noticeable trend of internationalisation, as the number of papers and presentations at international conferences had its best record with 197 entries.



- The number of consultancy and industry contract research projects in 2011 was 44.
- There were 5 submitted, 2 awarded, and 7 ongoing international research grants.
- There were 25 submitted, 10 awarded and 37 ongoing national research grants.
- A total of 56 various international and 57 national cooperation activities has been recorded.
- The membership list of ICIST members in editorial boards of international journals has a total of 48 entries. The membership of scientific committees has a total of 97 entries for international events and 37 for national events.
- There were 37 entries for the participation in the drafting of codes or recommendations at the international level, and 26 at the national level.
- 2 patents, 2 prototypes, 6 software applications and 1 model were registered in 2011.

