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ETS Arquitectura | Avda. Reina Mercedes, 2

## International Seminar on Courtyard Performance and Thermal Modelling

Inscripción: <https://forms.gle/2qGSdoShsXvaWRcp6>

MOREPATIO Project: Eco-Efficient Design of Building Courtyards using Reduced Order Models

FINANCED BY:



PROYECTOS I+D+i : MTM2015-64577-C2-1-R + MTM2015-64577-C2-2-R

ORGANIZERS:

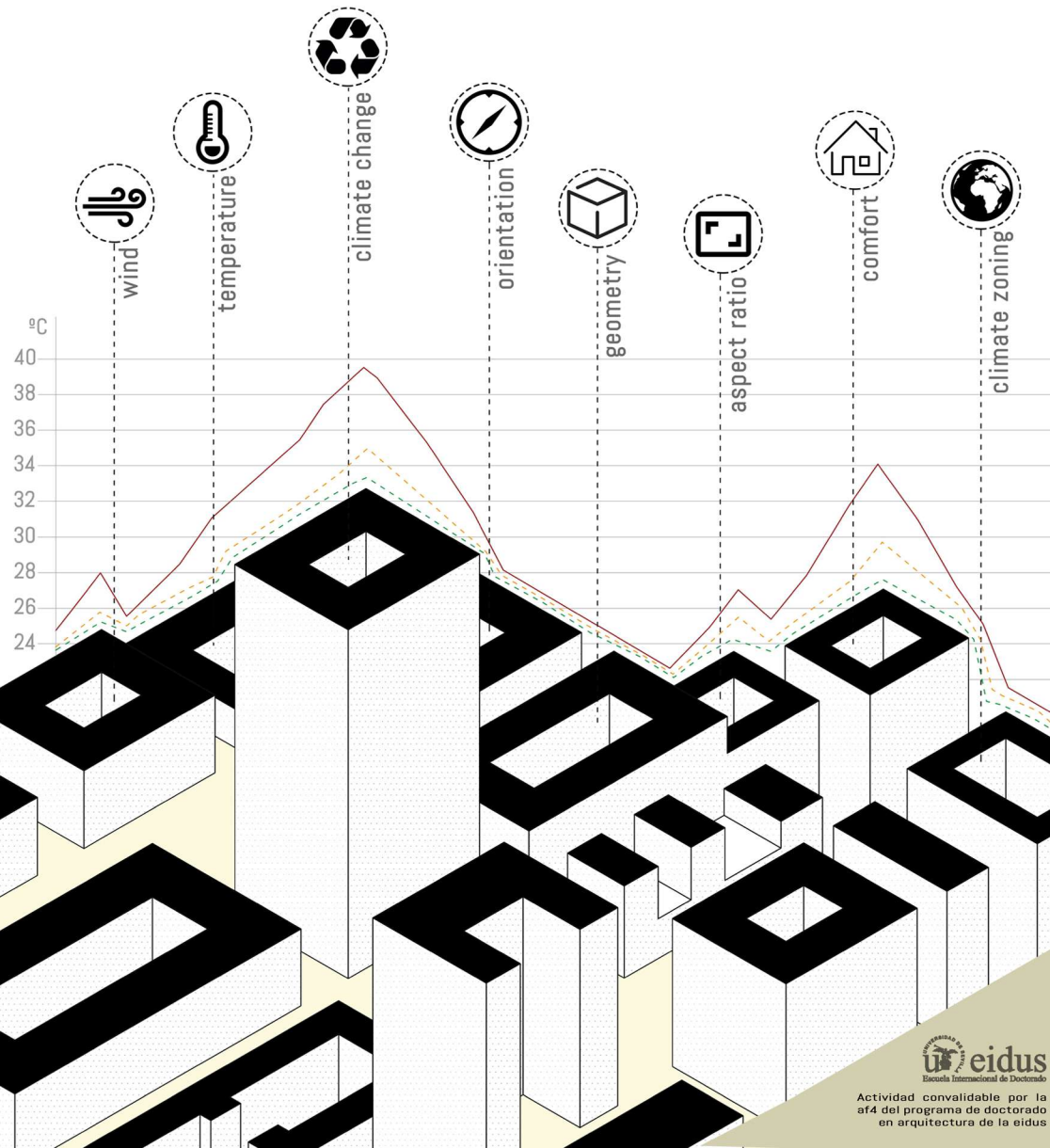


PARTICIPANTS:



HARVARD UNIVERSITY

University of Kent





## Content, informative nature and impact:

Social demand has promoted an acceleration and growth of research results at the university during the last decades. Problems faced nowadays by the scientific community share one characteristic: their increasing complexity. This factor is especially remarkable in those sectors focused on the production of goods or equipment that respond to different requirements. Architecture has always been a clear example of this multifunctionality. At any scale of analysis, there is always different points and demands to accomplish. On the other hand, applied research implies a high degree of specialization. The only way to solve this apparent contradiction and make the two sides compatible is through multidisciplinary teams. This workflow is useful to the research, given that it allows the continuous learning of the researchers in relation to the frontiers of their discipline while their own commitment is confined.

For more than 40 years, the scientific community has been revealing clearer signs of this progressive transformation in the climate. Knowing the problem is the first step to being able to solve it, or, at least, minimize its aftermaths. Many times, this picturing is a hard process that clash with the inertia of interests and established opinions. Nowadays, not only the scientific community but also most of our society is aware of the existence of the process of climate change. There are many strategies proposed to minimize the influence of our way of living in terms of emissions and global warming, some of them are related to the building design in two ways: To reduce their ecological footprint and adapt them to the future climate environment.

Our cities have suffered a deep transformation in the last centuries. Some of them have increased their population and this is expected to be the trend. Enormous population and building concentration make cities even further from the human scale. In this scenario, it is a must the renovation of those buildings that act as a structure of the city and its logical function and are classified as heritage. Some of them have to be technically studied to understand their performance, not as machines but as living organisms created to adapt to a specific climate.

Gentrification is another contemporary phenomenon. It has been promoted by the current easiness to move from one place to another, the inflation of the demand in specific strategical areas in the city and sometimes even promoted by urban renewal actions in marginal sectors. The problem of gentrification is not only that a specific area of the city loses its characteristics conferred by its consolidated population but also the speed of this phenomenon, that change the activities and people who live in a neighborhood in a few years when a few decades were needed to generate the previous structure.

Simulation tools are a significant development in the possibility of predicting the energy performance of buildings. Deep knowledge of the phenomena we want to simulate is needed in order to increase the accuracy of these tools. These kinds of software are relatively new and, most of the times, they don't have into account all the variables that converge to determine the final comfort of the user. However, they are becoming increasingly accurate and they help the design of more comfortable spaces and environmentally friendly buildings.

In this seminar, we will show the outcomes of the research into courtyards developed by a multidisciplinary team composed by researchers from the groups TEP143 Thermal Technology, FQM120 Mathematical Modeling, and Simulation of Environmental Systems and TEP206: Sustainable Architecture, Technology and Heritage (SATH). Relations with international groups allow the presence of two expert researchers from Harvard University (USA) and University of Kent (UK) which consolidate the international character of the proposal and will allow future research nets.

09:00 Opening

Dean of the School of Architecture of Seville.

09:30 Social value and Urban Ecology of the Mediterranean City. PAX as an anti-gentrification strategy.  
Gaia Redaelli. PhD Architect. **General Director of Refurbishment and Architecture of the Regional Government (2012-15) and head of the Public Space program "The Friendly City"**.

10:00 Relevance of the transition spaces. Natural ventilation and passive systems.  
Juan Manuel Rojas Fernández. Ph.D. Architect Hombre de Piedra Office. **Patron of the Contemporary Architecture Foundation.**

10:30 Coffee Break

11:00 Research in multidisciplinary teams. Thermofluid simulations of the MORE PATIO research project.  
Tomás Chacón Rebollo. Professor at the **University of Seville.**

11:30 Building performance simulation at the intersection of energy, occupant behavior, and health.  
Professor Holly W. Samuelson. Assistant Professor at the **Harvard Graduate School of Design.**

12:30 Performance of buildings and urban open spaces, thermal comfort, occupant perception and use.  
Professor Marialena Nikolopoulou. Deputy Head of School of Architecture and Planning. **University of Kent.**

13:30 Lunch

16:00 Courtyard performance in the Andalusian context. Case studies: MORE PATIO Research Project.  
Carmen Galán Marín. Professor at the **University of Seville.**

16:30 Energy Certification of Buildings. Influence of the transition spaces.  
Francisco José Sánchez de la Flor. Professor at the **University of Cadiz.**

17:00 MOREPATIO project multidisciplinary approach. Case studies. Young researchers interventions (6x10').  
'Reduced basis method applied to cloisters' Cristina Caravaca García  
'A temperature predictor based on machine learning techniques' Carlos Constantino Oitavén  
'Case study for passive cooling strategies in open areas' Enrique Ángel Rodríguez Jara  
'Courtyard microclimate simulation: Accuracy evaluation of modelling software' Victoria P. López Cabeza  
'Tempering potential-based evaluation of the courtyard' Eduardo M. Diz Mellado  
'Atrium effect assessment on educational buildings: A Case study' José Antonio Romero Otero

18:00 Panel discussion and closing of the seminar.

Guided by the Dean of the School of Architecture of Seville.