Dipartimento
di Architettura e Progetto

Sapienza
Università di Roma

Fondazione
Roma Sapienza

INTERNATIONAL CONFERENCE | Rome, **30 June – 1 – 2 July 2022**

CONF.ITECH 2022

TECHNOLOGICAL IMAGINATION

IN THE GREEN AND DIGITAL TRANSITION

Organised by
Sapienza University of Rome
DIAP | Department of Architecture and Design
LAB.ITECH Laboratory of Architecture | Building Innovation and Technology | Environment and Climate Changes | Health

Fondazione Roma Sapienza

PROGRAMME

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TECHNOLOGICAL IMAGINATION IN THE GREEN AND DIGITAL TRANSITION

The convention addresses the pressing need for sustainability in urban development over the medium and long terms, with cities to serve as *the main stage for strategies* that seek to meet the targets and the cross-sector priorities indicated in the EU's Next Generation, all in pursuit of a solid recovery on the part of the European economy, along lines of ecological transition, digitalisation, competitiveness, training and inclusion to overcome social, territorial and gender differences. The international study encounter is meant to *promote visions shared by architectural technology and other disciplines*, which, though they may appear to differ, are closely interconnected, with the aim of achieving an open, interdisciplinary integration capable of proposing concrete projects regarding topics held to be of strategic importance to the future of the built environment. These are identified to draw up evolving scenarios of architecture and cities suited to reflection, at various levels, on innovative models of process and product.

Conference Sessions

1.Innovation | Digital world for real cities

Chairs | Anna Maria Giovenale, Fabrizio Cumo

The digital revolution, heralded and described not only prior to its conclusion, but before it had even been triggered, is the key topic on the agenda of the world of planning and construction. A new paradigm is needed, in order to replace the documentation-based approach with a practical method of quality control able to recognise, in structural evidence and building processes, pivotal factors of development that can be used to measure and monitor the performance of the works to be built and the parties involved. The initial transition to the digital world, focussed on three-dimensional models, necessarily led to a significant transformation in planning, design, construction and management, in terms of both content and participants, with a focus on the organisation of collaborative information flows and production procedures, optimising instruments crucial to determining when top-quality results have been achieved.

It is precisely this surprising stock of untapped but available potential that makes digitalisation appear to be less a phase of evolutionary adaptation, strictly speaking, than both a major moment of growth and a tremendous opportunity.

The session is designed as an occasion for discussing the features of the driving factors of the imminent digital revolution, with particular attention to innovative methods and instruments for controlling the quality of construction projects and processes.

2.Technology | "Printed" buildings for sustainable habitats

Chair | Eugenio Arbizzani

The ongoing evolution of Industry 4.0 has inevitably made preservation and improvement of the existing ecosystem a key factor in the development of our constructed environment. As a result, processes and systems of production were radically restructured, orienting the technological innovations of the digital era towards decarbonisation while, at the same time, supporting new paradigms of social living.

The green and digital transition has brought forth objectives and solutions that radically interfere with existing methods for planning, developing and producing goods and services, as well as with utilisation of the energy and material resources whose chief consumer is the constructed environment.

The new technologies are meant to transform the system of habitation and the urban context by integrating ICT systems with technical spaces and elements, as well as artificial intelligence and the robotising of connected and collaborative construction processes, both in production facilities and worksites.

The session promotes discussion of the impact of new technologies of design and manufacturing on the construction of buildings and the urban environment, in addition to examining the potential side-effects of the new models of habitation on the quality of life and people's perception of the same.

CONFERENCE THEME

Conference Sessions

3. Environment | Technological innovation for low tech environments

Chair | Carola Clemente

Technological innovation has long been the driving force of the material progress of civilisations, improving health, safety and quality of life while creating more closely connected, well integrated communities; advanced technologies have identified more efficient sources of energy, but also led to extreme growth in the consumption of the resources needed for their maintenance.

A new balance between development and the ecosystem calls for a revision of the drivers of innovation, in terms of their efficiency in transforming the anthropogenic environment and narrowing the great divides (of wealth, health and technology). The sustainability and decarbonisation of all production sectors is based on soft skills applied to governing processes and optimising skills and technologies, so as to leave behind an anthropic ecosystem of high technological intensity for a managed environment of low intensity and high efficiency. At the frontier of innovation, technology's impact is reduced and reformulated, with an emphasis on intangible resources and planning capabilities for transforming the built environment.

The session is designed as a forum for discussing R&D models and planning strategies for a low-tech environment, with advanced integration of carbon-neutral buildings/plants, so to revive the built environment through a low-intensity, high-efficiency approach to energy and environment concerns. Particular attention will be placed on contexts of energy and economic poverty in which the digital and technological divides are barriers to development and inclusion.

4. Climate Changes | Effective solutions for resilient urban habitats

Chair | Eliana Cangelli

Today's cities constitute both a problem and a solution to contrasting climate change they continue to grow, consuming more than two-thirds of all energy while producing equal levels of emissions. It follows that rendering the constructed environment adaptive and resilient under the effects of climate change, and climate neutral as well, is a key challenge to be faced, and won, over the next ten years, so as to achieve the goal for greenhouse-gas reduction by 2030.

The use of new technologies, the limitation of land consumption and more attentive consideration of the how the ground is covered, and of urban density, along with the reuse and technological retooling, with respect to function, energy and ecosystem factors, of decaying areas and buildings, represents the path taken by planning to arrive at the creation of healthy, resilient urban habitats capable of adjusting to ongoing changes, so as to promote prosperity, inclusiveness and social equity.

The session is meant to encourage discussion of procedural models, strategies and planning solutions, technological and digital, useful to defining new images of resilient cities capable of contributing to reducing the effects of climate change while lowering their own ecological footprint. Particular importance will be placed on understanding and evaluating the impact of the pandemic in the formulation of initiatives that can be of aid in drawing up scenarios for the future evolution of the urban environment.

CONFERENCE THEME

Conference Sessions

5. Health | Environments for healthy living

Chair | Francesca Giofrè

The topic of people's health is relevant to the full range of potential ushered in by technological innovation and processes of ecological and digital transition, touching on all its component factors. In international conventions, the definition of health has evolved to "a state of complete physical, mental and social wellbeing", and not simply "an absence of illness or infirmity", so that it is now viewed as "a resource for everyday life".

Health is a proactive concept whose promotion is not relegated exclusively to the medical sector's ability to meet the population's needs, but rather represents the measures through which "an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment" (WHO).

Health, the result of a complex system that is both adaptive and dynamic, evolves through interaction between the potential of individuals and the social and environmental determinants to which they are subject.

The session is organised as a discussion of how the environmental determinants of health, along with their 'tangible manifestations', can be characterised and examined within the framework of architectural technology, at the various working scales, as well as through an osmotic dialogue with other disciplines.

The challenge is to draw up visions of planning, decision-making, design and execution that focus on people, foreseeing the short-, medium- and long-term impacts on their health.

SCHEDULE OF EVENTS

Thursday 30 June 2022

12:00 pm **Registration**
2:30 pm

3:00 pm **Conference opening | Institutional greetings**

Magnificent Rector of Sapienza University of Rome
Antonella Polimeni

President Fondazione Roma Sapienza
Eugenio Gaudio

Head of the European Commission Representation in Italy
Antonio Parenti

Director Department of Architecture and Design
Alessandra Capuano

President Italian Society of Architectural Technology - SITdA
Mario Losasso

4:00 pm **Opening lecture |** Pietro Montani

4:30 pm **Innovation Session**

Chair | Anna Maria Giovenale, Fabrizio Cumo

Introduction

Video interviews

Discussant | Maurizio Talamo

5:00 pm
6:15 pm

Digital-twin for an innovative waterfront management. Strategy pilot project DSH2030
M. G. Pacifico, M. R. Pinto, A. Novellino

Digital Twin Models supporting cognitive buildings for Ambient Assisted Living
L. Binni, B. Naticchia, A. Corneli, M. Vaccarini

Untapping the potential of the digital towards the green imperative: the interdisciplinary beXlab experience
G. Calcagno, A. Trombadore, G. Pierucci, L. Montoni

COGNIBUILD: cognitive digital twin framework for advanced building management and predictive maintenance
S. Agostinelli

Short-term wind speed forecasting model using hybrid neural networks and wavelet packet decomposition
A. Lakzadeh, M. Hassani, A. Heydari, F. Keynia, D. Groppi, D. A. Garcia

2:00 - 4:30 pm Opening coffee station

SCHEDULE OF EVENTS

Friday 1 July 2022

9:00 am **Conference opening | Institutional greetings**
Dean Faculty of Architecture | Orazio Carpenzano

9:15 am **Technology Session**

Chair | Eugenio Arbizzani
Introduction
Video interviews
Discussant | Francesco Leali

9:45 am – 11:00 am

Sharing innovation. The acceptability of off-site industrialised systems for housing
E. Ginelli, G. Pozzi, G. Vignati

3D Printing for Housing. Recurring Architectural Themes
G. Paparella, M. Percoco

Reworking studio design education driven by 3D printing technologies
J. Milošević, A. Nenadović, M. Žujović, M. Gavrilović, M. Živković

Technological innovation for circularity and sustainability through buildings' life cycles: policy, initiatives and stakeholders' perspective
S. Giorgi

Fair play: why reliable data for low tech construction and non-conventional materials are needed
R. Mazelli, M. Bocci, A. Bohn, E. Z. Escamilla, G. Habert, A. Bocco

11:15 am **Environment Session**

Chair | Carola Clemente
Introduction
Video interviews
Discussant | Helena Coch Roura

11:45 am – 1:00 pm

From nature to architecture for low tech solutions: biomimetic principles for climate-adaptive building envelopes
F. Sommese, G. Ausiello

Imagining a Carbon Neutral University
A. Violano, M. Cannaviello

Life Cycle Assessment at the early stage of building design
A. Dalla Valle

Design scenarios for a circular vision of post-disaster temporary settlements
M. V. Arnetoli, R. Bologna

Towards Climate Neutrality: progressing key actions for positive energy districts implementation
R. Romano, M. B. Andreucci, E. Giancola

1:00 - 2:30 pm Light lunch

2:30 pm **Climate Changes Session**

Chair | Eliana Cangelli
Introduction
Video interviews
Discussant | Anna Pirani

3:00 pm – 4:15 pm

Digital twins for climate-neutral and resilient cities. State of the art and future development as tools to support urban decision making
G. Ricciardi, G. Callegari

New urban centralities. Universities as a paradigm for a sustainable city
C. Maitan, E. Faroldi

Temporary climate change adaptation: 5 measures for outdoor spaces of the mid-Adriatic city
T. D. Brownlee

Challenges and potentials of green roof retrofit: a case study
N. Miletić, B. Zeković, N. C. Ignjatović, D. Ignjatović

Adaptive "Velario"
A. Raimondi. L. Rosini

SCHEDULE OF EVENTS

Friday 1 July 2022

4:45 pm **Health Session**

Chair | Francesca Giofrè

Introduction

Video interviews

Discussant | Matteo Vitali

5:15 pm New paradigms for Indoor Healthy Living

6:30 pm *A. De Capua*

Environmental Sensing and Simulations for the healthy district: a comparison between field measurements and CFD model
M. Giovanardi, M. Trane, R. Pollo

A new generation of Territorial Healthcare Infrastructures after Covid-19. The transition to community homes and community hospitals into the framework of the Italian Recovery Plan
A. Brambilla, E. Brusamolin, S. Arruzzoli, S. Capolongo

Environmental attributes for Healthcare Professional's Well-being
Z. Hammouni, W. Wittich

Wood Snoezelen. Multisensory wooden environments for the care and rehabilitation of people with severe and very severe cognitive disabilities
A. Tonetti, M. Rossetti

4:00 - 6:00 pm Opening coffee station

Saturday 2 July 2022

9:30 am **Round table discussions**

Innovation
Digital world for real cities
Chair | Anna Maria Giovenale, Fabrizio Cumo

Technology
"Printed" buildings for sustainable habitats
Chair | Eugenio Arbizzani

Environment
Technological innovation for low tech environments
Chair | Carola Clemente

Climate Changes
Effective solutions for resilient urban habitats
Chair | Eliana Cangelli

Health
Environments for healthy living
Chair | Francesca Giofrè

11:30 am **Conference closing**

QUICK REFERENCE

Speakers index

Innovation Session

Agostinelli Sofia | Sapienza University of Rome
Binni Leonardo | Marche Polytechnic University
Calcagno Gisella | University of Florence
Corneli Alessandra | Marche Polytechnic University
Garcia Davide Astiaso | Sapienza University of Rome
Groppi Daniele | Sapienza University of Rome
Hassani Mohammad | Islamic Azad University
Heydari Azim | Sapienza University of Rome
Keynia Farshid | Graduate University of Advanced Technology
Lakzadeh Adel | Islamic Azad University
Montoni Lucia | University of Florence
Naticchia Berardo | Marche Polytechnic University
Novellino Antonio | ETT S.p.A.
Pacifico Maria Giovanna | University of Naples Federico II
Pierucci Giacomo | University of Florence
Pinto Maria Rita | University of Naples Federico II
Trombadore Antonella | University of Florence
Vaccarini Massimo | Marche Polytechnic University

Technology Session

Bocci Martina | Polytechnic University of Turin
Bocco Andrea | Polytechnic University of Turin
Bohn Arthur | Polytechnic University of Turin
Escamilla Edwin Zea | ETH Zurich
Gavrilović Marko | University of Belgrade
Ginelli Elisabetta | Polytechnic University of Milan
Giorgi Serena | Polytechnic University of Milan
Habert Guillaume | ETH Zurich
Mazelli Redina | Polytechnic University of Turin
Milošević Jelena | University of Belgrade
Nenadović Aleksandra | University of Belgrade
Paparella Giulio | Sapienza University of Rome
Percoco Maura | Sapienza University of Rome
Pozzi Gianluca | Polytechnic University of Milan
Vignati Giulia | Polytechnic University of Milan
Živković Milijana | University of Belgrade
Žujović Maša | University of Belgrade

QUICK REFERENCE

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Environment Session

Andreucci Maria Beatrice | Sapienza University of Rome
Arnetoli Maria Vittoria | University of Florence
Ausiello Gigliola | University of Naples Federico II
Bologna Roberto | University of Florence
Cannaviello Monica | University of Campania "L. Vanvitelli"
Dalla Valle Anna | Polytechnic University of Milan
Giancola Emanuela | 2UiE3 - CIEMAT
Romano Rosa | University of Florence
Sommese Francesco | University of Naples Federico II
Violano Antonella | University of Campania "L. Vanvitelli"

Climate Changes Session

Brownlee Timothy D. | University of Camerino
Callegari Guido | Polytechnic University of Turin
Cukovic Ignjatovic Natasa | University of Belgrade
Faroldi Emilio | Polytechnic University of Milan
Ignjatović Dušan | University of Belgrade
Maitan Camilla | Polytechnic University of Milan
Miletić Nikola | University of Belgrade
Raimondi Alberto | Uniroma Tre
Ricciardi Guglielmo | Polytechnic University of Turin
Rosini Laura | Uniroma Tre
Zeković Bojana D. | University of Belgrade

Health Session

Arruzzoli Stefano | Polytechnic University of Milan
Brambilla Andrea | Polytechnic University of Milan
Brusamolin Erica | Polytechnic University of Milan
Bucci Raffaella | Italian National Agency for Regional Healthcare Services - AGENAS
Capolongo Stefano | Polytechnic University of Milan
De Capua Alberto | Mediterranea University of Reggio Calabria
Giovanardi Matteo | Polytechnic University of Turin
Hammouni Zakia | Université de Montréal
Mutti Amelia | Italian National Agency for Regional Healthcare Services - AGENAS
Pollo Riccardo | Polytechnic University of Turin
Rossetti Massimo | Iuav University of Venice
Tonetti Agata | Iuav University of Venice
Trane Matteo | Polytechnic University of Turin
Walter Wittich | Université de Montréal

CONFERENCE VENUE

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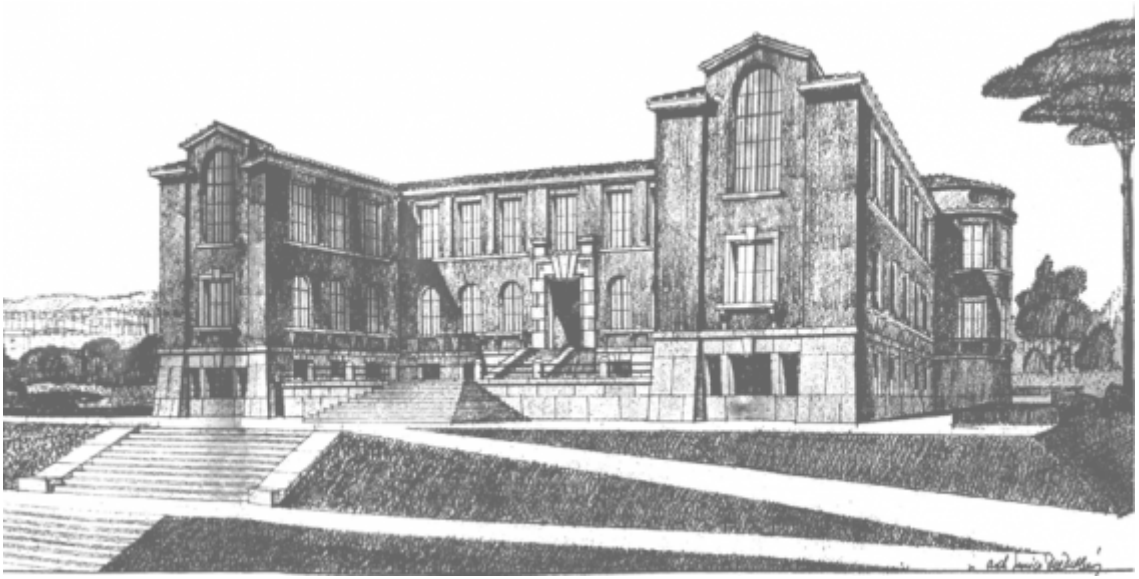

Enrico Del Debbio - 1930

Getting there

By Train

From Termini Station

Metro A towards Battistini to Flaminio Station • Line 19 to Faculty of Architecture, Via A. Gramsci, 53

By Airplane

From International Leonardo Da Vinci Airport

Leonardo Express RV 4651 to Roma Termini Station • Metro A towards Battistini to Flaminio Station • Line 19 to Faculty of Architecture, Via A. Gramsci, 53

From Ciampino Airport

Bus line 520 to Tuscolana/Cinecittà • Metro A towards Battistini to Flaminio Station • Line 19 to Faculty of Architecture, Via A. Gramsci, 53