Inspired by the work of Dominic Michaelis, an English architect and inventor who came up with the technology for a solar-powered hot air balloon, Poetic Cosmos of the Breath is a time-based, experimental, solar dome that takes flight only under certain climatic conditions. It uses deceptively simple materials: a paper-thin foil accompanied by a few sand bags, and a handful of participants to produce a startlingly ethereal, shimmering effect. Staged at dawn, as temperature conditions naturally shift, air inside the balloon is heated by a greenhouse effect and the lightweight material slowly lifts off the ground completely unaided by machines or electrical power. At the same time, sunlight cast through the material creates a vibrant rainbow-tinged iridescent glow. Firstly commissioned by Arts Catalyst in 2007 as a performative action at Gunpowder Park in Essex, the installation was later presented in 2013 at “Mobile M+:Inflation”, Hong Kong as a temporary event occurring periodically during the show.
WELCOME TO ICSA2019

The foundations for the 1st International Conference on Structures and Architecture, which took place in Guimarães in 2010, were laid in 2007, aiming to present research and developments on the merging of architecture and structural engineering. Following the success of ICSA2010 the 2nd and 3rd editions were held again in Guimarães in 2013 and 2016, respectively.

Since then the conference progressively became the world’s leading event bridging the gap between Structures and Architecture. It is worth to mention that there exists a core group of committed colleagues with a background in architecture and in structural engineering who endeavoured to grant the outstanding position that ICSA has nowadays.

After three highly successful conferences in Guimarães, time had come to move ICSA new editions to a further level. Thus, in the closure session of ICSA2016 it was announced that ICSA2019 would be held in Lisbon.

Personally I had the feeling that it was the right moment to constitute an International Association of Structures and Architecture, aiming to explore and to promote the merging of the fields of Structures and Architecture, encompassing all the aspects related with the recent advances in the art, practice and theory of teaching, researching, designing and building structures.

In October 2016 the Association was formally constituted envisioning to be worldwide recognized as an exceptional and highly effective organization with a noteworthy contribution in the fields of Structures and Architecture. It is governed by principles of integrity, credibility, plurality and diversity, mutual respect, transparency and accountability, enlarged cooperation and free development of ideas.

The main objectives of the Association are: (i) to foster cooperation among all those involved in the fields covered by the association; (ii) to stimulate the inventive and creative design of architectural structures and to persuade architects and structural engineers to collaborate in this process, exploiting together new concepts, applications and challenges; (iii) to continually encourage the collaboration with other societies and associations with similar objectives.

For this purpose, among other initiatives, the Association: (i) will promote actions aiming at the progress of all aspects of the theory and application of structures and architecture; (ii) will organise the international conference on structures and architecture (ICSA) every three-years; (iii) will co-sponsor or endorse other symposia and conferences.

Structures and Architecture – Bridging the Gap and Crossing Borders contains the lectures and papers presented at the Fourth International Conference on Structures and Architecture (ICSA2019) that was held in Lisbon, Portugal, in July 2019. It also contains a USB flash card with the full texts of the lectures presented at the conference, including the 5 keynote lectures, and almost 150 selected contributions. The contributions on creative and scientific aspects in the conception and construction of structures, on advanced technologies and on complex architectural and structural applications represent a fine blend of scientific, technical and practical novelties in both fields.

ICSA2019 covers all major aspects of structures and architecture, including: building envelopes / facades; comprehension of complex forms; computer and experimental methods; futuristic structures; concrete and masonry structures; educating architects and structural engineers; emerging technologies; glass structures; innovative architectural and structural design; lightweight and membrane structures; special structures; steel and composite structures; structural design challenges; tall buildings; the borderline between architecture and structural engineering; the history of the relationship between architects and structural engineers; the tectonic of architectural solutions; the use of new materials; timber structures, among others.

The interest of the international community in all these subjects has been confirmed by the high response to the call of papers. In fact, more than three hundred abstracts were received at the Conference Secretariat. About forty-seven percent of them were selected for final publication as full-papers and presentation at the Conference.

This set of book and USB flash card is intended for a global readership of researchers and practitioners, including architects, structural and construction engineers, builders and building consultants, constructors, material suppliers and product manufacturers, and other professionals involved in the design and realization of architectural, structural and infrastructural projects.

The Chairman of the Conference and President of the International Association of Structures and Architecture would like to take this opportunity to express a sincere recognition to authors, organizers of mini-symposium and special sessions and participants for their valuable contributions to the Conference. Our special thanks to the members of the International Scientific Committee for their committed work and for the time and effort they have devoted to make of ICSA2019 a successful event. Last, but not least, we would like to express our sincere gratitude to all the sponsors of ICSA2019 for their support and their belief.

Paulo J. S. Cruz
ICSA 2019 Chair
NON FINANCIAL SPONSORS

MAIN INSTITUTIONAL SPONSORS

The International Federation for Structural Concrete

IABSE

IABSE – International Association for Bridge and Structural Engineering

INTERNATIONAL INSTITUTIONS

aci – American Concrete Institute

bibm – Federation for the European Precast Concrete Industry

BTES – Building Technology Educator’s Society

EUCEET – European Civil Engineering Education and Training

efca – European Federation of Engineering Consultancy Associations

NATIONAL INSTITUTIONS

APEE – Associação Portuguesa de Engenharia de Estruturas

GPBE – Grupo Português de Betão Estrutural

Lab2PT – Laboratório de Paisagens, Património e Território

Universidade do Minho Escola de Arquitetura

Instituto de Design de Guimarães

Advanced Ceramics R&D Lab

TensiNet
CONFERENCE ORGANIZATION

CONFERENCE CHAIR
Paulo J. S. Cruz,
School of Architecture, University of Minho,
Guimarães, Portugal

LOCAL ORGANISING COMMITTEE
Paulo Cruz
University of Minho, Portugal (Chair)
Ana Tostões
University of Lisbon, Portugal
Bruno Figueiredo
University of Minho, Portugal
Rui Póvoas
University of Porto, Portugal
Vitor Murtinho
University of Coimbra, Portugal

CONFERENCE SCIENTIFIC COMMITTEE
Ailong Chen
Tongji University, China
Anders Rønnquist
Norwegian University of Science and Technology, Norway
Andreas Falk
Royal Institute of Technology, Sweden
Anne Beim
The Royal Danish Academy of Fine Arts, Denmark
Bjorn Normann Sandaker
The Oslo School of Architecture and Design, Norway
Bruno Figueiredo
University of Minho, Portugal
Christian Louter
TUDelft, Netherlands
Climent Molins
Universitat Politècnica de Catalunya, Spain
Dario Parigi
Aalborg University, Denmark
Deborah Oakley
University of Nevada, Las Vegas, United States of America
Eduardo Fernandes
University of Minho, Portugal
Elio Gomes da Silva
Chamber of Deputies – Brasil, Brazil
Felix Suarez
University of Coruña, Spain
Fred Veer
TUDelft, Netherlands
Günther H. Filz
Aalto University, Finland
Humberto Rodriguez-Camilloni
Virginia Tech University, United States of America
Ian Smith
University of New Brunswick, Canada
Jose Manuel Cabrero
University of Navarra, Spain
Juan Maria Songel
Universitat Politècnica de València, Spain
James Doerfler
Philadelphia University, United States of America
James O’Callaghan
Eckersley O’Callaghan, United Kingdom
Jan Belis
Ghent University, Belgium
Jan Siem
Norwegian University of Science and Technology, Norway
Javier Estévez
Universidad de A Coruña, Spain
Jens Schneider
TU Darmstadt, Germany
Joanna Jablonska
Wroclaw University of Science & Technology, Poland
Jochen Stahl
Fast + Epp GmbH, Germany
John Chilton
University of Nottingham, United Kingdom
Jose Sánchez
University of Brasilia, Brazil
Juan Perez Valcárcel
Universidad de A Coruña, Spain
Kay-Uwe Schober
Mainz University of Applied Sciences, Germany
Kevin Dong
Cal Poly – San Luis Obispo, United States of America
Lars Damkilde
Aalborg University, Denmark
Luyten Laurens
KU Leuven, Belgium
M. Arif Kamal
Aligarh Muslim University, India
Marie Frier Hvejsel
Aalborg University, Denmark
Maciej Piekarśki
Rzeszow University of Technology, Poland
Mario Rinke
ETH Zürich, Switzerland
Marios C. Phocas
University of Cyprus, Cyprus
Marta Molina
University of Seville, Spain
Martina Eliášová
Czech Technical University, Czech Republic
Maziar Asef
Tabriz Islamic Art University, Islamic Republic of Iran
Michael Hensel
Oslo School of Architecture and Design, Norway
Miguel C. Fernandez-Cabo
Universidad Politécnica de Madrid, Spain
Mircea Georgescu
The Politehnica University of Timisoara, Romania
Oggen Marina
University SS. Cyril and Methodius, Macedonia
Olga Popovic-Larsen
The Royal Danish Academy of Fine Arts, Denmark
Ornella Iuorio
University of Leeds, United Kingdom
Patrizia Trovalusci
Sapienza University of Rome, Italy
Paulo Cruz
University of Minho, Portugal
Paulo Mendonça
University of Minho, Portugal
Paulo Tormenta Pinto
Instituto Universitário de Lisboa, Portugal
Rebecca Gravina
RMIT University, Australia
Régis Schwaen
North Dakota State University, United States of America
Romuald Tarczewski
Wroclaw University of Technology, Poland
Rossella Corraro
University of Palermo, Italy
Rui Póvoas
University of Porto, Portugal
Siu Lai Chan
University of Porto, Portugal
Stefano Gabrielle
University Roma Tre, Italy
Terri Boake
University of Waterloo, Canada
Thomas Thiis
Norwegian University of Life Sciences, Norway
Toni Kotnik
Aalto University, Finland
Tsutomu Shigemura
Kanagawa University, Japan
Ulrich Knaack
TUDelft, Netherlands
Urs Meister
University of Liechtenstein, Liechtenstein
Vilquin Thomas
Université Libre de Bruxelles, Belgium
Vitor Murtinho
University of Coimbra, Portugal
Yukio Tamura
Tokyo Polytechnic University, Japan
GENERAL INFORMATION

CONFERENCE VENUE

The Conference will be held at the Convention Centre of the Calouste Gulbenkian Foundation in Lisbon, Portugal. The Calouste Gulbenkian Foundation is located close to Praça de Espanha, inside a 7.5 hectare garden. The main entrance is at Avenida de Berna, 45A. The two closest metro stations to the Calouste Gulbenkian Foundation are São Sebastião (blue and red lines) and Praça de Espanha (blue line).

PROCEEDINGS
The book of abstracts and a CD-ROM will be distributed with registration’s materials at the Conference.

SCHEDULE
An overview of the schedule is provided on the back cover of this program.

ONSITE REGISTRATION
Onsite registration fees are:
- 600 € – IASA Members*
- 700 € – Non Members*
- 350 € – Students**
- 350 € – Accompanying persons***

(*) Fee includes technical documentation, reception, lunches, coffee-breaks and conference gala dinner.
(**) Institutional certification required. Student fee does not include lunches nor participation in the conference gala dinner.
(***) Including reception, social program tours & gala dinner.

OPENING CEREMONY
Time: Wednesday, July 24, 09:00 – 09:30
Place: Auditorium 2

GENERAL MEETING – INTERNATIONAL ASSOCIATION OF STRUCTURES AND ARCHITECTURE
Time: Thursday, July 25, 17:00 – 17:30
Place: Auditorium 2

CLOSING CEREMONY
Time: Friday, July 26, 17:00 – 17:30
Place: Auditorium 2

KEYNOTE LECTURES

Fernando Branco,
“Design for durability” (Wednesday, July 24, Auditorium 2)

Olivier Grossetête,
“Builders of ephemeral monumental constructions in cardboard” (Wednesday, July 24, Auditorium 2)

Anne Beim,
“Tectonic ecologies in architecture – a critical perspective in a time of transition” (Thursday, July 25, Auditorium 2)

Hugo Corres,
“Architects + Engineers: a very creative and productive collaboration” (Thursday, July 25, Auditorium 2)

L. Ren & Xin Ruan,
“Design for future: A new way of storytelling on footbridge” (Friday, July 26, Auditorium 2)
ICSA2019 MINI-SYMPHOSIUM

**WeM 1, WeA 1 & WeE 1: Mini-Symposium on Circular Tectonics:**
Towards ecological continuity, means, relations, strategies and innovation in architectural practice

The notion of 'tectonics' has been developed and applied throughout architectural history as a critical means through which to position the discipline in its context; the societal, technological as well as the physical. Today the complexity of contextual relations and challenges that govern architecture are multiplying and governed by an over more present call for a viable, ecological, human development of the built environment. With the title 'Circular Tectonics', this mini symposium investigates the potential of tectonic architectural theory and method for arriving at ecological continuity, means, relations, and innovation in architectural practice. Hence, we invite critical contributions that discuss, develop, and apply tectonics related to questions such as 'design for disassembly', 're- and upcycling', 'life cycle scenarios' 'transformation versus preservation' etc.

**Coordinated by:**
Marie Frier Hvejsel, Department of Architecture, Design & Media Technology, Aalborg University, Aalborg, Denmark
Anne Beim, The Royal Danish Academy of Fine Arts School of Architecture, CINARK, Copenhagen, Denmark

**ICSA2019 SPECIAL SESSIONS**

**WeM 4: Wood: Structure and Expression**
In the current wood architecture, the appearance of wood as a structural element is usually limited to log constructions, where the load-bearing wall is visually present. In most wood constructions, the material is used for the skeleton structure but covered with other materials and not expressed anymore. The goal of this special session is to broaden the perspectives and avoid a limited use of the material. In combining traditional craftsmanship and industrial production, the different speakers are aiming to research on new solutions, which develop new ways for the use of wood in different historical and technical cultures.

**Coordinated by:**
Jan Helge Siem, Department of Architecture & Technology, Norwegian University of Science and Technology, Trondheim, Norway
UrsMeister, DelInstitute of Architecture & Planning, University of Liechtenstein, Valuz, Liechtenstein

**WE 2: Crafting spatiality: Explorations with components and connections for spatial architectural structures**
Currently digital design tools offer interesting ways of exploring novel structural expressions. Defining and understanding complex geometries through digital tools offers new opportunities for creating novel solutions. Furthermore, advanced fabrication technologies enable complex processing of building components. However, a deep spatial thinking is needed to use the potentials of the many new possibilities of technology in design and fabrication.

This session looks into explorative spatial configurations of components and connections in structures of different scales using precision and the control of complexity to unlock new structural and architectural capacities. Aspects such as:
- Which structural and formal qualities of complex spatial arrangements can be unlocked?
- How can novel spatial arrangements in connections help to improve their performance and functionality?

**Complexity v.s. simplicity: how do we achieve the optimal balance between material/structural efficiency, through fabrication and buildability, leading to novel spatial solutions?**

**Coordinated by:**
Mario Rinke, ETH Zürich, Zürich, Switzerland
Olga Popovic Larsen, Royal Danish Academy of Fine Arts, Copenhagen, Denmark

**PRESENTATION GUIDELINES**

The presentations should take 15 minutes plus 5 minutes for audience questions. This schedule will be strictly enforced.

Each paper session will be attended by a chairman, responsible for monitoring the time and enlightening the author, through a signal, once there are 5 minutes left to the end of the presentation.

Personal Computer (MS Windows) with PowerPoint will be available at each Session room.
No laptops will be allowed to connect to the LCD projector for making presentations.
Authors are requested to provide their presentation files at the Conference Desk. Please make sure no Asian fonts are used or, if those fonts are necessary, all fonts are embedded in the Power Point file.

**SOCIAL PROGRAM**

The social program includes the welcome reception and gala dinner for the participants (registration as ’Student’ does not include the gala dinner). The registration as accompanying person also includes the participation in several tours.

**Visit to the exhibition “The Bones of Architecture” and Welcome Reception, Wednesday, July 24th, 19:30**
Garagem Sul, Centro Cultural de Belém (CCB)

The construction of Centro Cultural de Belém was decided in 1988 to welcome and accommodate the Portuguese European Union Presidency, in 1992, remaining subsequently as a core facility for cultural and leisure activities.
The building was designed by the architects Vittorio Gregotti (Italy) and Manuel Salgado (Portugal), today has a strong cultural programme and plays important part as a Conference Centre. It has been classified since 2002 as a monument of public interest.

An international architectural competition was held. 6 out of the 57 proposals received have been invited to develop a preliminary project. The selected proposal belonged to the architects consortium Vittorio Gregotti (Italy) and Manuel Salgado (Portugal). They designed the construction of five modules – Conference Centre, Performing Arts Centre, Exhibition Centre, Hotel Zone and Complementary Equipment. Only the first ones were raised, namely, the Conference Centre, the Performing Arts Centre and the Exhibition Centre.

With the project of the two remaining modules of the original plan currently under way, presently the CCB occupies a construction area of 97,000 sq meters, distributed along 60,000 sq meters and separated by two internal streets, connected by a pedestrian way, creating continuity with the Praça do Império outside. This building can be seen as a small city with gardens, lakes, bridges, slopes, and small hidden places, where the nobility of the Museum Square stands out.

Since 2002, the Centro Cultural de Belém has been classified as a monument of public interest, and is included in the Special Protection Area of the Mosteiro of Santa Maria de Belém.

Housed in a former parking garage, Garagem Sul's large space offers a unique atmosphere for the presentation of architectural works and ideas. Since 2012, it has organised a regular programme of temporary exhibitions, either of the work of well-established architects or that explore other fields relevant to understanding architecture as a way of knowing how to transform the world. These exhibitions are mounted in partnership with other Portuguese and international institutions, putting Garagem Sul and Lisbon on the map as part of a global network of venues that present contemporary architecture.

The exhibition 'The Bones of Architecture' examines the cultivation of structures in the service of architecture as developed by diversely different designers who are all active in building practice. These designers – altogether seven European architects and engineers – show their works and approaches, reflecting upon rules, strategies and methods in the design of structures.

Gala Dinner, Thursday, July 25, 20:00

Casino Lisboa – Restaurante Beltejo

Inaugurated on April 19, 2006, the Casino Lisboa is located near the Tagus River, in Lisbon's modern Parque das Nações, an emerging tourist hub, served by four hotels, surrounded by various infrastructure services and entertainment.

Casino Lisboa occupies the pavilion formerly occupied by the Future Pavilion, one of the main attractions of the World Expo of ’98, bolstering a refined, yet minimalist architecture. The building was extensively rebuilt for its new purpose under a project by architect Fernando Jorge Correia. Inside, opal floors and glass walls merge with alluring solutions powered by the latest in multimedia hardware.

There are often major shows at the over-600-seat Oceans Auditorium as well as a variety of performances at the rotating central bar.

Located on the second floor with a stunning view to Tagus Rives, the Beltejo Room is ideal for exclusive events.

ACCOMPANYING PERSON’S PROGRAM

1) Sintra and Cascais (full day tour), July 24th, 10:00 – 17:00
Departure in the direction of the charming Sintra region, once referred to by Lord Byron as his “Glorious Eden”. There you will visit the Royal Palace of Sintra, fabulous residence of numerous kings of Portugal, with its precise painted ceiling tiles and an extraordinarily large kitchen.

Leaving the Palace, the clients will have some free time to walk through the streets of Sintra, full of small shops of tiles and ceramics, where they will be able to taste the typical cakes of Sintra, Queijadas and Travesseiros de Sintra. Lunch in a local restaurant. After Lunch visit to Cabo da Roca. The tour will continue with the views of the Tagus to Cascais, Boca do Inferno and Estoril.

Price per person: for a minimum of 20 people € 77,00
Including: Bus transportation starting and arriving at the Venue; Official English speaking Guide; “Palácio da Vila” Entrance; Lunch.

2) Lisbon (half day tour), July 25th, 09:00 – 13:00
An unforgettable journey to of Lisbon’s noble areas. Belém featuring iconic buildings from the 15th and 16th century, related to the Portuguese Discoveries.

Explore the beautiful Jerónimos Monastery built in the 1500’s (closed on Mondays). The church interior unveils a gorgeous Gothic-Renaissance style altar, as well as the tombs of great Portuguese explorers.

Restore the energy in one of the oldest and most famous pastry shops of Lisbon to taste the delicious Belém Pastry.

Price per person: for a minimum of 20 people € 41,00
Including: Bus transportation starting and arriving at the Venue; Official English speaking Guide; Jerónimos Monastery Entrance; Pastéis de Belém.

3) Mafra and Ericeira (full day tour), July 26th, 09:30 – 17:00
Departure towards Mafra - visit to this ancient village conquered to the Moors in the XII century. Focus on the Mafra Convent - one of the most beautiful Portuguese monuments, with its world-famous carillon, formed by 114 bells. Initially conceived as a small convent for 13 friars, the project for the Real Convent of Mafra is an immense building of about 40,000 m2.

Proceeding to North, we shall stop in Ericeira where we will have lunch in a local restaurant. Ericeira is an old picturesque fishing village, also known as the “Portuguese Mecca of surf”, to have lunch. After, before coming back, we can walk around and visit the village with its narrow cobblestone streets, characteristic housing, singular monuments and enjoy the breathtaking views of the ocean.

After lunch, some free time before the departure to Lisbon.
Price per person: for a minimum of 20 people € 72,00
Including: Bus transportation starting and arriving at the Venue; Official English speaking Guide; Mafra Convent Entrance; Lunch.
CALOUSTE GULBENKIAN FOUNDATION MAP
## Conference Program

**Tuesday, July 23, 2019**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:00</td>
<td><strong>Conference Accreditation</strong></td>
<td>ICSA2019 Desk – Calouste Gulbenkian Foundation / Congress Centre</td>
</tr>
</tbody>
</table>

**Wednesday Morning (WeM), July 24, 2019**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00</td>
<td><strong>Conference Accreditation</strong></td>
<td>ICSA2019 Desk – Calouste Gulbenkian Foundation / Congress Centre</td>
</tr>
<tr>
<td>09:00</td>
<td><strong>Opening Ceremony</strong></td>
<td>(Auditorium 2)</td>
</tr>
<tr>
<td>09:30</td>
<td><strong>Keynote Lectures</strong></td>
<td>(Auditorium 2)</td>
</tr>
<tr>
<td>10:30</td>
<td><strong>Coffee Break</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Concurrent Technical Sessions (WeM 1 to WeM 4)

<table>
<thead>
<tr>
<th>Mini-Symposium</th>
<th>General Session</th>
<th>General Session</th>
<th>General Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circular Tectonics: Towards ecological continuity, – means, – relations, strategies and innovation in architectural practice (1) Introduction and Concepts</td>
<td>Special structures (1)</td>
<td>The history of the relationship between architects and structural engineers</td>
<td>Wood: Structure and Expression</td>
</tr>
<tr>
<td>M.F. Hvejsel &amp; A. Beim</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circular Tectonics? – A critical discussion of how the architectural discipline can drive ecological continuity</td>
<td>Parametric description of the movement of reciprocal transformable geometry surfaces, for adaptive environment materialization</td>
<td>The 1935 Portuguese reinforced concrete code: Background, sources and authors</td>
<td>A Universe of wood joinery</td>
</tr>
<tr>
<td>Connecting Ends with Beginnings – Conceptual framework for a circular art of tectonics</td>
<td>Drie Fonteinen Bridge Brussels-Charleroi; Lessons learnt form a multidisciplinary design process in a digital design era</td>
<td>Steel visions. Fiorini’s “mechanical architectures”</td>
<td>Tectonic in the education</td>
</tr>
<tr>
<td>J. Holst</td>
<td>J.E.P. Snits &amp; A.F. Blankenspoor</td>
<td>R. Morganti, A. Tosone, M. Abita &amp; D. Di Donato</td>
<td>C. Rist-Stadelmann</td>
</tr>
<tr>
<td>The Compatibility of Architecture and Circular Economy</td>
<td>Expandable bar structures for emergency situations</td>
<td>The Engineer Emilio H. Baumgart and the Brazilian Architecture in reinforced concrete of the first half of the twentieth-century</td>
<td>Connected Knowledge</td>
</tr>
<tr>
<td>Dialectical Tectonics – Ontology and tectonic ecology of form, material and form without material</td>
<td>Scale effect and load-bearing behavior of a reconfigurable hybrid structure</td>
<td>Walter Gropius &amp; Ove Arup: Collaboration, ‘total design’ &amp; the ‘composite mind’</td>
<td>Full-scale wood architecture as educational tool</td>
</tr>
<tr>
<td>K. Usto</td>
<td>M. Matheou, M.C. Phocas &amp; E.G. Christoforou</td>
<td>F. Trubiano</td>
<td>J. Siem, B.O. Braaten &amp; A. Gilberg</td>
</tr>
<tr>
<td>Sustainable Building Renovation: Towards a holistic tectonics thinking framework in sustainable transformation of the built environment</td>
<td>Morphological investigation of a tensile helicoid for display during the 2018 Biennale Architecture in Venice</td>
<td>Arne Johnson’s material research introducing steel frame building in postwar Sweden</td>
<td>Optimization and shaping of indeterminate frame structures</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WeA 1 – Auditorium 2</td>
<td>WeA 2 – Auditorium 3</td>
<td>WeA 3 – Room 1</td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------</td>
<td>----------------</td>
<td></td>
</tr>
<tr>
<td><strong>Mini-Symposium</strong></td>
<td><strong>General Session</strong></td>
<td><strong>General Session</strong></td>
<td></td>
</tr>
<tr>
<td>Circular Tectonics: Towards ecological continuity, -means, - relations, strategies and -innovation in architectural practice (2 &amp; 3) Systems &amp; Economics</td>
<td>Innovative architectural and structural design (1)</td>
<td>The use of new materials</td>
<td></td>
</tr>
<tr>
<td><strong>Chairs:</strong> M.F. Hvejsel &amp; A. Beim</td>
<td><strong>Chair:</strong> T. Boake</td>
<td><strong>Chair:</strong> F. Veer</td>
<td></td>
</tr>
<tr>
<td>Isolating the Tectonics of Insulation</td>
<td>Housing experiments of the 1920s fuelling innovation. The multicellular construction system</td>
<td>Mycelium-based materials at the dawn of the Anthropocene</td>
<td></td>
</tr>
<tr>
<td>H. Ejstrup</td>
<td>A. Cel Mare</td>
<td>E. Elsacker, E. Peeters &amp; L. De Laet</td>
<td></td>
</tr>
<tr>
<td>A tectonic approach to energy renovation of dwellings – The case of Gellerup</td>
<td>Modularity in architectural design: lessons from a housing case</td>
<td>Use and challenges of new concretes in the 21st century</td>
<td></td>
</tr>
<tr>
<td>Transformation of architectural heritage through adaptive modular systems</td>
<td>Shape of arch – Is it important?</td>
<td>Experimental Design and Building of a Cable Reinforced Plastic Brick Arch</td>
<td></td>
</tr>
<tr>
<td>Building circular economy – Strategies for decoupling in architectural practice</td>
<td>Prefabricated Ultracompact Module for steel framed structures</td>
<td>Load capacity testing method for non-conventional nodes joining linear structural paper components</td>
<td></td>
</tr>
<tr>
<td>Invis <strong>Invisible Tectonics: Nano Materials, Chemical Synthesis, and Human Health</strong></td>
<td>Rethinking BIM: Non-cartesian geometry through hybrid workflows</td>
<td>Experimental earth composite shells</td>
<td></td>
</tr>
<tr>
<td>F. Trubiano</td>
<td>Y. Zavoleas</td>
<td>J. Belis, S. Willaert, K. Martens, B. Van Lancker &amp; M. Achenza</td>
<td></td>
</tr>
<tr>
<td>Beautiful Tectonics – Corporeal aesthetic in tectonics as sustainable parameter</td>
<td>Dynamic shelter structure</td>
<td>Vulnerability of earth material to water: A state of the art</td>
<td></td>
</tr>
<tr>
<td>N.B. Andersen</td>
<td>F. Maden, D. Ölmez, Ş. Gür, M.Y. Uncu &amp; C. Mitropoulou</td>
<td>E. Pauporté &amp; L. Sgambi</td>
<td></td>
</tr>
<tr>
<td>Structural innovation in the architecture of Thomas Jefferson</td>
<td>Experimental research and evaluation of the application of selected nanosuspensions on in-situ historical material surfaces</td>
<td>K. Krostová, J. Witzany, D. Škoda &amp; I. Kufíka</td>
<td></td>
</tr>
</tbody>
</table>
### Wednesday Evening (WeE), July 24, 2019

16:00 – 16:30 **Coffee Break**

16:30 – 17:30 **Concurrent Technical Sessions**  
**WeE 1 to WeE 4**

<table>
<thead>
<tr>
<th><strong>WeE 1 – Auditorium 2</strong></th>
<th><strong>WeE 2 – Auditorium 3</strong></th>
<th><strong>WeE 3 – Room 1</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mini-Symposium</strong></td>
<td><strong>Special Session</strong></td>
<td><strong>General Session</strong></td>
</tr>
<tr>
<td>Circular Tectonics: Towards ecological continuity, -means, - relations, strategies and -innovation in architectural practice (4) Learnings</td>
<td>Crafting Spatiality: Explorations with components and connections for spatial architectural structures</td>
<td>Glass structures</td>
</tr>
<tr>
<td>Chairs: M.F. Hvejsel &amp; A. Beim</td>
<td>Chairs: M. Rinke &amp; O. Popovik Larsen</td>
<td>Chair: J. Belis</td>
</tr>
<tr>
<td>The presence of timber – Oral history versus architectural theory</td>
<td>Bending-active kit-of-parts systems: Uniformity generating complexity</td>
<td>Performance of the compressed pillar made of solid glass bricks in comparison with other materials</td>
</tr>
<tr>
<td>Circular Tectonics, Users, and Local Culture</td>
<td>Exploration of spatial structures made from reused elements and the design of optimal kits-of-parts</td>
<td>Current analytical computational methods of laminated glass panels in comparison to FEM simulation</td>
</tr>
<tr>
<td><strong>J. Johansson</strong></td>
<td>J. Brütting, C. Fivet &amp; G. Senatore</td>
<td>T. Hána, K. V. Machalická, M. Vokáč &amp; M. Eliašová</td>
</tr>
<tr>
<td>Tectonic Learning Ecologies: Elements for a circular architecture pedagogy in the work of Fernando Távora</td>
<td>Rotational stiffness in timber joinery connections: Analytical and experimental characterizations of the Nuki joint</td>
<td>On configuration and structural design of frameless glass structures</td>
</tr>
<tr>
<td></td>
<td>A Tectonic methodology for timber joints. The excellence of detail in the era of technology throughout an experimental investigation</td>
<td>Performance of glass brick wall exposed to fire</td>
</tr>
<tr>
<td></td>
<td>L. Catalá Bustos, P.H. Kirkegaard, P.F. Sonne-Frederiksen &amp; J. Buthke</td>
<td>Z. Sokol &amp; M. Eliašová</td>
</tr>
</tbody>
</table>

17:30 – 18:00 **Presentation of the Associated Event – The Bones of Architecture – An exhibition on design practices**  
(Auditorium 2) – A. Tavares & M. Rinke

19:30 – 22:30 **Visit to the exhibition “The Bones of Architecture” & Welcome Reception**  
(Centro Cultural de Belém)
### Thursday Morning (ThM), July 25, 2019

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00 – 10:00</td>
<td><strong>Conference Accreditation</strong></td>
<td>ICSA2019 Desk – Calouste Gulbenkian Foundation / Congress Centre</td>
</tr>
<tr>
<td>09:00 – 10:00</td>
<td><strong>Keynote Lectures (Auditorium 2)</strong></td>
<td>Chair: U. Knaack</td>
</tr>
<tr>
<td></td>
<td>A. Beim</td>
<td>“Tectonic ecologies in architecture – a critical perspective in a time of transition”</td>
</tr>
<tr>
<td></td>
<td>H. Corres</td>
<td>“Architects + Engineers: a very creative and productive collaboration”</td>
</tr>
<tr>
<td>10:00 – 10:30</td>
<td><strong>Coffee Break</strong></td>
<td></td>
</tr>
<tr>
<td>10:30 – 12:00</td>
<td>Concurrent Technical Sessions</td>
<td>ThM 1 to ThM 3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Session</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Session</strong></td>
<td>Comprehension of complex forms &amp; Concept architectural buildings</td>
</tr>
<tr>
<td>Chair: B. Figueiredo</td>
<td></td>
</tr>
<tr>
<td><strong>General Session</strong></td>
<td>Innovative architectural and structural design (2)</td>
</tr>
<tr>
<td>Chair: K. Dong</td>
<td></td>
</tr>
<tr>
<td><strong>General Session</strong></td>
<td>Other &amp; Lightweight and membrane structures</td>
</tr>
<tr>
<td>Chair: K. Liapi</td>
<td></td>
</tr>
<tr>
<td><strong>Complex Geometries of Environmentally Sensitive Forms</strong></td>
<td></td>
</tr>
<tr>
<td>M.G. Fineout</td>
<td></td>
</tr>
<tr>
<td><strong>Configuration and mechanical characteristics of 1.5-Layer Space Frames</strong></td>
<td></td>
</tr>
<tr>
<td>P.-S. Chen</td>
<td></td>
</tr>
<tr>
<td><strong>Multi-dimensional form finding: structure, construction and sustainability</strong></td>
<td></td>
</tr>
<tr>
<td>D. Parigi &amp; L. Damkilde</td>
<td></td>
</tr>
<tr>
<td><strong>Innovative daylight structures for airport terminal and concourse buildings</strong></td>
<td></td>
</tr>
<tr>
<td>W. Place, M. Salamati &amp; J. Hu</td>
<td></td>
</tr>
<tr>
<td><strong>Materials science, spanning the divide between architecture and structural engineering</strong></td>
<td></td>
</tr>
<tr>
<td>F.A. Veer, L. van Ellen &amp; M. Nazari</td>
<td></td>
</tr>
<tr>
<td><strong>Deployable structures of reciprocal crossed arches</strong></td>
<td></td>
</tr>
<tr>
<td>M. Muñoz-Vidal, I. López-César, J. Pérez-Valcárce &amp; F. Suárez-Riestra</td>
<td></td>
</tr>
<tr>
<td><strong>Digital Fascinations Versus Constructed Reality: Towards Achieving Excellence in Execution, A Practical Approach</strong></td>
<td></td>
</tr>
<tr>
<td>T.M. Boake</td>
<td></td>
</tr>
<tr>
<td><strong>Innovative bridges over Bega</strong></td>
<td></td>
</tr>
<tr>
<td>L. Todăș, E. Meteș, E. Petzeș, M. Todăș, G. Ispășoiu &amp; B. Zaha</td>
<td></td>
</tr>
<tr>
<td><strong>Flex Skin: Developing a material system based on interlocking wooden panels</strong></td>
<td></td>
</tr>
<tr>
<td>F. Fotouhi, M. Hudert, G. Kayo &amp; T. Kotrak</td>
<td></td>
</tr>
<tr>
<td><strong>Deployable structures with straight bars: Design, manufacturing and assembly</strong></td>
<td></td>
</tr>
<tr>
<td>O.F. Avellaneda Lopez</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>Activity</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>12:30 – 14:00</td>
<td>Lunch Break</td>
</tr>
<tr>
<td>14:00 – 15:30</td>
<td>Concurrent Technical Sessions ThA 1 to ThA 3</td>
</tr>
</tbody>
</table>

**Thursday Afternoon (ThA), July 25, 2019**

**General Session**
- **ThA 1 – Auditorium 2**
  - The tectonic of architectural solutions (1)
  - Chair: P. Trovalusci
  - E. Fernandes
- **ThA 2 - Auditorium 3**
  - The borderline between architecture and structural engineering (1)
  - Chair: E. Gomes
  - A. Keller & M. Mosoarca
- **ThA 3 – Room 1**
  - Special Session
  - Tall buildings
  - Chair: D. Oakley
  - L. Sgambi & B. Sato

**General Session**
- The construction of the Porto School
- From AgwA to Oversize: From design practice to a pedagogic and research project
- J. J. Ferrer Forés
- B. Burquel, H. Fallon & B. Vandenbulcke

**Special Session**
- The tectonic structures of Sverre Fehn
- Towards a design framework for the structural systems of tall buildings that considers embodied greenhouse gas emissions
- J. Helal, A. Stephan & R.H. Crawford
- I. Onescu, E. Onescu & M. Mosoarca

**Conference Sessions**
- Temporal Reciprocities of Building and Site: Structural Patterns for Resilient Future-Use Structures
- Multi-criterial vulnerability assessment for Timisoara city, Romania
- M.M. Laboy
- I. Onescu, E. Onescu & M. Mosoarca

- Low Impact Spans: Toward Emission-Based Structural Optimization
- Design-to-live or Design-to-build? The impact of delegated design responsibility in Melbourne’s high-rise residential buildings
- M. Mayer & L. Echevarria
- From form-finding to space-making in high-rise designs
- C. Bañón

- The construction of the Porto School Historic timber roof structures: Value and influence on the seismic behaviour of heritage buildings
- E. Fernandes
- A. Keller & M. Mosoarca

- The tectonic structures of Sverre Fehn
- From AgwA to Oversize: From design practice to a pedagogic and research project
- J. J. Ferrer Forés
- B. Burquel, H. Fallon & B. Vandenbulcke

- Temporal Reciprocities of Building and Site: Structural Patterns for Resilient Future-Use Structures
- Multi-criterial vulnerability assessment for Timisoara city, Romania
- M.M. Laboy
- I. Onescu, E. Onescu & M. Mosoarca

- Low Impact Spans: Toward Emission-Based Structural Optimization
- Design-to-live or Design-to-build? The impact of delegated design responsibility in Melbourne’s high-rise residential buildings
- M. Mayer & L. Echevarria
- From form-finding to space-making in high-rise designs
- C. Bañón
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:30 – 16:30</td>
<td><strong>Concurrent Technical Sessions</strong></td>
</tr>
</tbody>
</table>
| **ThE 1** – Auditorium 2 | General Session  
|                    | The tectonic of architectural solutions (2)                         |
|                    | Chair: E. Fernandes                                                  |
| **ThE 2** – Auditorium 3 | General Session  
|                    | The borderline between architecture and structural engineering (2)    |
|                    | Chair: F. Suárez Riestra                                            |
| **ThE 3** – Room 1 | General Session  
|                    | Educating architects and structural engineers (1)                    |
|                    | Chair: G. Mircea                                                     |
| 16:30 – 17:00      | **Coffee Break**                                                     |
| 17:00 – 18:00      | **General Meeting**    
<p>|                    | International Association of Structures and Architecture (Auditorium 2) |
| 20:00 – 23:00      | <strong>Gala Dinner</strong> (Casino de Lisboa – Restaurante Beltejo)             |</p>
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:30 – 17:00</td>
<td><strong>Conference Accreditation</strong></td>
<td>ICSA2019 Desk – Calouste Gulbenkian Foundation / Congress Centre</td>
</tr>
<tr>
<td>10:00 – 10:30</td>
<td><strong>Keynote Lecture</strong> (Auditorium 2) Chair: A. Chen L. Ren</td>
<td>“Design for future: A new way of storytelling on footbridge”</td>
</tr>
<tr>
<td>10:30 – 12:30</td>
<td><strong>Concurrent Technical Sessions</strong> FrM 1 to FrM 3</td>
<td></td>
</tr>
</tbody>
</table>

**Friday Morning (FrM), July 26, 2019**

<table>
<thead>
<tr>
<th>FrM 1 – Auditorium 2</th>
<th>FrM 2 – Auditorium 3</th>
<th>FrM 3 – Room 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Session</strong></td>
<td><strong>General Session</strong></td>
<td><strong>General Session</strong></td>
</tr>
<tr>
<td>Timber structures</td>
<td>Concrete and masonry structures</td>
<td>Educating architects and structural engineers (2)</td>
</tr>
<tr>
<td>Chair: J. Manoel Sánchez</td>
<td>Chair: J. Pérez Valcárcel</td>
<td>Chair: V. Murtinho</td>
</tr>
<tr>
<td>Active bending in timber structures: Case studies in design, development and construction</td>
<td>Concrete Masonry Units: Innovation design strategies through architecture and building technology integration</td>
<td>Experience-Based Learning in Construction Education. Testing the Effectiveness of the Product-Oriented Learning Situation</td>
</tr>
<tr>
<td><strong>P. Tidwell</strong></td>
<td><strong>C. Manrique, D. Armpriest, S. He &amp; G. Florenca</strong></td>
<td><strong>I. Vrouwe &amp; L. Luyten</strong></td>
</tr>
<tr>
<td>Can timber lower the environmental impact of tall buildings?</td>
<td>Rehabilitation of Trumpeters’ Tower of the Saint Margaret Evangelical Church of Medias</td>
<td>MERGE: Exploring new paradigms for educating educators, engineers and builders</td>
</tr>
<tr>
<td><strong>C. De Wolf &amp; C. Fivet</strong></td>
<td><strong>V. Ungureanu, M. Georgescu &amp; L. Gilgor</strong></td>
<td><strong>J. Kansler &amp; J. Doerfler</strong></td>
</tr>
<tr>
<td>Timber T-section beams: From pre-tensioning to self-tensioning</td>
<td>A Platform of Design Strategies for the Optimization of Concrete Floor Systems in India</td>
<td>The Structural Depth of the Masonry Antidome and Ambidome</td>
</tr>
<tr>
<td>Paper and cardboard as a sustainable building materials</td>
<td>A prototype for precast covers. An optimal solution by Torroja</td>
<td>From abstract construction to community integration</td>
</tr>
<tr>
<td><strong>J.F. Łątka</strong></td>
<td><strong>J. Antuña &amp; B. Orta</strong></td>
<td><strong>L.H. Hansen</strong></td>
</tr>
<tr>
<td>Making-of Pringle: Hybrid structure from equitangential, bending active, wooden frame and minimal surface robe-net</td>
<td>Research into the response of segmental masonry barrel vaults to dynamic loading effects</td>
<td>Integrating design science and systems thinking for active learning</td>
</tr>
<tr>
<td><strong>G.H. Filz</strong></td>
<td><strong>J. Witzany, R. Zigler, T. Čejka, J. Karas, J. Kubát, M. Pirner &amp; S. Urushadze</strong></td>
<td><strong>M.M. Laboy</strong></td>
</tr>
<tr>
<td>Case studies on spatial timber constructions in modern architecture and public art</td>
<td>The Sorolla Institute of Valencia (Spain). A project by J.R. Azpiazu</td>
<td>Teaching Reflection: The Unrealized Potential of Log Construction</td>
</tr>
<tr>
<td><strong>Y.T. Shi &amp; L.Y. Wu</strong></td>
<td><strong>E. Fenollosa, I. Cabrera &amp; B. Serrano</strong></td>
<td><strong>J.K. Zhu, P. Gheiri &amp; R.S. Diedering</strong></td>
</tr>
<tr>
<td>The process of rocking CLT into a HOT cabin</td>
<td>Masonry tectonics: Craft, labor, &amp; structural innovation in architectural education</td>
<td>Education on Structural Glass Design: Redefining glass through the design of innovative, full-glass structures</td>
</tr>
</tbody>
</table>
## Friday Afternoon (FrA), July 26, 2019

**12:30 – 14:00**  
**Lunch Break**

**14:00 – 15:30**  
**Concurrent Technical Sessions**  
FrA 1 to FrA 3

<table>
<thead>
<tr>
<th>FrA 1 – Auditorium 2</th>
<th>FrA 2 – Auditorium 3</th>
<th>FrA 3 – Room 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Session</strong></td>
<td><strong>General Session</strong></td>
<td><strong>General Session</strong></td>
</tr>
<tr>
<td>Building envelopes (1)</td>
<td>Steel and composite structures &amp; Structural design challenges</td>
<td>Educating architects and structural engineers (3)</td>
</tr>
<tr>
<td>Chair: G.H. Filz</td>
<td>Chair: R. Póvoas</td>
<td>Chair: O. Iuorio</td>
</tr>
<tr>
<td>Strategies for the refurbishment of heritagelisted post-war facades</td>
<td>Symbol and technique of steel domes in Italy</td>
<td>Parametric design and analysis of building structures in the Architecture School of A Coruña</td>
</tr>
<tr>
<td>Wrapping up and weaving buildings: handcrafted techniques in contemporary architecture</td>
<td>Structural aluminium in architecture -- The history and future of aluminium as a structural material</td>
<td>Structural integrity and functionality of form; exploring relations of load-bearing elements and architectural form in the education of engineers</td>
</tr>
<tr>
<td>I. Curiel Peraza</td>
<td>S.H. Dyvik, B. Manum, J. H. Mork &amp; M. Luczkowski</td>
<td>A. Rennquist, B. Manum &amp; N. Labonnote</td>
</tr>
<tr>
<td>A Hybrid Adaptive Composite Based Auxiliary Envelope</td>
<td>The ephemeral robustness: Structure for temporary constructions</td>
<td>Transforming structure: The metaphorical construction process and structural design</td>
</tr>
<tr>
<td>Structural adhesive connections for building façade applications</td>
<td>From Repetition to Chaos: Complex Fabrications in Contemporary Steel Structures</td>
<td>Teaching Construction Thinking in Architecture through Materiality and Craftsmanship</td>
</tr>
<tr>
<td>K.V. Machalická, M. Vokáč, M. Zikmundová &amp; M. Eliášová</td>
<td>T. M. Boake</td>
<td>M. Rinke</td>
</tr>
<tr>
<td>Structural Comparison of Scissor-hinge Linkages</td>
<td>Adaptation of a monument building for accessibility of disabled persons, a case study</td>
<td></td>
</tr>
</tbody>
</table>
Friday Evening (FrE), July 26, 2019

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:30 – 16:00</td>
<td>Coffee Break</td>
</tr>
<tr>
<td>16:00 – 17:30</td>
<td>Concurrent Technical Sessions FrE 1 to FrE 3</td>
</tr>
</tbody>
</table>

### FrE 1 – Auditorium 2

<table>
<thead>
<tr>
<th>General Session</th>
<th>FrE 2 – Auditorium 3</th>
<th>FrE 3 – Room 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building envelopes (2)</td>
<td>General Session Computer and experimental methods</td>
<td>General Session Educating architects and structural engineers (4)</td>
</tr>
<tr>
<td>Chair: M. Eliášová</td>
<td>Chair: D. Parigi</td>
<td>Chair: J.F. Łątka</td>
</tr>
<tr>
<td>Good looking and safe: “heavy” Facades in Seismic Zones</td>
<td>Conceptual design in the years of the numerical revolution: risks and perspectives</td>
<td>Timber tectonics in the digital age: Interdisciplinary learning for data-driven wood architecture</td>
</tr>
<tr>
<td>M. Roik</td>
<td>L. Kubiak &amp; L. Sgambi</td>
<td>M. Riggio &amp; N.Y. Cheng</td>
</tr>
<tr>
<td>Energy efficiency study applied on a monument building</td>
<td>Challenges of additive manufacturing of architectural ceramic components</td>
<td>Research Initiatives: Structural Application into Design Process</td>
</tr>
<tr>
<td>Fastening technology as an interface and integration element of architectural, structural, and building engineering</td>
<td>Design exploration of architectural geometries and structural performance for sports arenas based on SOM-clustering and structural performance simulation</td>
<td>Aspects of the integral teaching of Structures and Architectural Design</td>
</tr>
<tr>
<td>P. Spyridis</td>
<td>W. Pan, Y. Sun, M. Turrin, C. Louter &amp; I. S. Sariyildiz</td>
<td>M. Blenkuš &amp; T. Krušec</td>
</tr>
<tr>
<td></td>
<td>Experimental dynamic behavior of an historical thin shell structure in concrete: the Paraboloid of Casale Monferrato</td>
<td>Advanced structural integration collaboratory model for architecture students</td>
</tr>
<tr>
<td></td>
<td>E. Lenticchia, R. Ceravolo &amp; S. Invernizzi</td>
<td>T. Fowler &amp; S. Rihal</td>
</tr>
<tr>
<td></td>
<td>Exploring experimental methods on teaching structures for architects: first results of a new course at FAUP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E. Brito &amp; R.F. Póvoas</td>
<td></td>
</tr>
</tbody>
</table>

17:30 – 18:00 Closing Ceremony (Auditorium 2)
AUTHOR INDEX

A
Abita, M. WeM 3-R1, FrA 2-A3
Achenz, M. WeA 3-R1
Akgün, Y. FrA 2-A3
Aktas, E. FrA 2-A3
Anaya Díaz, J. WeM 2-A3
Andersen, N.B. WeA 1-A2
Antuña, J. FrM 2-A3
Aragón Fitera, J. ThM 3-R1
Armbruster, D. ThE 3-R1, FrM 2-A3
Avellaneda Lopez, O.F. ThM 3-R1

B
Bach, R. WeA 3-R1
Bañoñ, C. ThA 3-R1
Beim, A. WeM 1-A2, ThKL-A2
Belis, J. WeA 3-R1
Bernabeu-Larena, A. FrA 2-A3
Bernabeu-Larena, J. FrA 2-A3
Blankenspoor, A. WeM 2-A3
Blenkuš, M. FrE 3-R1
Boake, T.M. ThM 1-A2, FrA 2-A3
Bocan, C. FrA 3-R1, FrE 1-A2
Bocan, D. FrA 3-R1, FrE 1-A2
Borgno, J. WeA 3-R1
Braaten, B.O. WeM 4-R2
Brancart, S. WeE 2-A3
Branco, F. WeKL-A2
Bristogianni, I. FrM 3-R1
Brito, E. FrE 3-R1
Brüting, J. WeE 2-A3
Bundgaard, C. WeA 1-A2
Burquel, A. ThA 3-A3
Buttko, J. WeA 1-A2, WeE 2-A3

C
Cabrera, I. FrM 2-A3
Callahan, M. FrE 3-R1
Capurso, G. ThE 3-R1
Casal-Rodríguez, A. WeM 2-A3, ThM 3-R1
Catalá Bustos, L. WeE 2-A3
Čeja, T. FrM 2-A3
Cel Mare, A. WeA 2-A3
Ceravolo, R. FrE 2-A3
Cervero Sánchez, N. ThE 1-A2
Chen, P.S. WeE 3-R1, ThM 2-A3
Cheng, N.Y. FrE 3-R1
Christoforou, E.G. WeM 2-A3
Correia, A.L. WeA 2-A3
Corres, H. ThKL
Crawford, R.H. ThA 3-R1
Cruz, P.J.S. FrE 2-A3
Curiel Peraza, I. FrA 1-A2

D
da Fonseca, R.P. WeM 3-R1
da Silva, E.G. WeM 3-R1
Damkalde, L. ThM 1-A2
De Laet, L. WeE 3-R1, WeE 2-A3
De Lima, V. WeE 3-R1
De Temmerman, N. WeE 2-A3
De Wolf, C. FrM 1-A2
Delgado, J.P. WeM 3-R1
Dessi-Olive, J. FrM 2-A3
Di DonatoD, WeM 3-R1, FrA 2-A3
Diederich, R.S. FrM 3-R1
Dodson, J. FrM 1-A2
Doerfler, J. FrM 3-R1
Dong, K. ThA 3-A2
Dykvik, S.H. FrA 2-A3

E
Eberhardt, S. ThE 2-A3
Echevarría, L. ThA 1-A2
Ejstrup, H. WeM 1-A2, WeA 1-A2
Elačová, M. WeE 3-R1, FrA 1-A2
Ellis, E.V. FrA 3-R1
Elsacker, E. WeA 3-R1
Estévez-Cimadevilla, J. WeA 2-A3, FrM 1-A2, FrA 3-R1
E. Petzak ThM 2-A3
E.G. Christoforou WeM 2-A3
E.G. da Silva WeM 3-R1
E.V. Ellis FrA 3-R1

F
Fallon, H. ThA 2-A3
Fang, D.L. WeE 2-A3
Fenollosa, E. FrM 2-A3
Fernandes, E. ThA 1-A2
Ferreira, L. FrE 2-A3
Ferrer Forés, J.I. ThA 1-A2
Figueiredo, B. FrE 2-A3
Fila, J. WeE 3-R1
Filz, G.H. FrM 1-A2
Fineout, M.G. ThM 1-A2
Fivet, C. WeE 2-A3, FrM 1-A2
Florenca, G. FrM 2-A3
Foged, I.W. FrA 1-A2
Fotouhi, F. ThM 2-A3
Fowler, T. ThE 2-A3, FrE 3-R1
Frederiksen, L.K. WeA 1-A2
Freire-Tellado, M. WeM 2-A3

G
Gentry, R. FrM 2-A3
Georgeescu, M. FrA 2-A3
Ghelichi, P. FrM 3-R1
Gianetti, I. ThE 3-R1
Gilberg, A. WeM 4-R2
Gligor, L. FrM 2-A3
Gómez-Magide, D. WeM 2-A3
Gómez-Mateo, J. FrA 2-A3
Goncalves, R. FrE 2-A3
Grobe, U. WeE 1-A2
Grossetête, O. WeKL-A2
Gür, Ş. WeA 2-A3

H
Hána, T. WeE 3-R1
Hansen, L.H. FrM 3-R1
Harfmann, A.C. ThE 3-R1
He, S. FrM 2-A3
Helal, J. ThA 3-R1
Hermo Sanchez, Y. ThM 3-R1
Hippert, M.A.S. ThM 3-R1
Holst, J. WeM 1-A2
Houck, L.D. FrM 1-A2
Houdmont, L.T. WeA 3-R1
Hu, J. ThM 2-A3
Hudert, M. ThM 2-A3
Hvejsel, M.F. WeM 1-A2, WeE 1-A2

I
Invernizzi, S. FrE 2-A3
Ioannidis, A. WeM 2-A3
Iori, T. ThE 3-R1
Ismail, M.A. FrM 2-A3
Ispasoiu, G. ThM 2-A3
Iuorio, O. ThM 3-R1

J
Jannasch, E. FrM 3-R1
Järvenpää, E. WeA 2-A3
Jensen, S.R. WeA 1-A2
Johansson, J. WeE 1-A2

K
Kamari, A. WeM 1-A2
Kanli, E. WeA 3-R1
Kansler, J. FrM 3-R1
Karas, J. FrM 2-A3
Kayo, G. ThM 2-A3
Keller, A. ThA 2-A3, FrA 3-R1, FrE 1-A2
Kirkegaard, P.H. WeM 1-A2, WeA 1-A2, WeE 2-A3
Kiziltoprak, N. WeA 3-R1
Knaack, U. WeA 3-R1
Kotnik, T. ThM 2-A3
Kratzer, D.A. FrA 3-R1
Kroftová, K. WeE 3-R1
Krušec, T. FrE 3-R1
Kubát, J. FrM 2-A3
Kubiak, L. FrE 2-A3
Kulitka, I. WeA 3-R1

L
Labonnote, N. FrA 3-R1
Labay, M.M. ThA 1-A2, FrM 3-R1
Larsen, N.M. WeA 1-A2
Łątka, J.F. FrM 1-A2
Lentticchia, E. FrE 2-A3
Liai, K.A. WeM 2-A3
Longo, O.C. ThM 3-R1
López-César, I. ThM 2-A3
Louter, C. FrM 3-R1, FrE 2-A3
Luczkowski, M. FrA 2-A3
Luisi, A. WeA 3-R1
Luyten, L. FrM 3-R1
## ICSA2019 SHORT PROGRAM

**Tuesday, July 23, 2019**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
</table>
| 15:00 – 19:00 | Conference Accreditation  
ICSA2019 Desk – Calouste Gulbenkian Foundation / Congress Centre |

**Wednesday, July 24, 2019**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
</table>
| 08:00 – 19:00 | Conference Accreditation  
ICSA2019 Desk – Calouste Gulbenkian Foundation / Congress Centre |
| 09:00 – 09:30 | Opening Ceremony  
(Auditorium 2) |
| 09:30 – 10:30 | Keynote Lectures  
(Auditorium 2) |
| 10:30 – 11:00 | Coffee Break |
| 11:00 – 12:30 | WeM 1 Mini-symposium  
Circular Tectonics (1)  
WeM 2 General Session  
Special structures (1)  
WeM 3 General Session  
The history of the relationship between architects and structural engineers  
WeM 4 Special Session  
Wood: Structure and Expression |
| 11:00 – 12:30 | Lunch Break |
| 12:30 – 14:00 | Coffee Break |
| 14:00 – 16:00 | WeE 1 Mini-symposium  
Circular Tectonics (2 & 3)  
WeA 2 General Session  
Innovative architectural and structural design (1)  
WeA 3 General Session  
The use of new materials |
| 16:00 – 16:30 | Coffee Break |
| 16:30 – 17:30 | WeE 1 Mini-symposium  
Circular Tectonics (4)  
WeE 2 Special Session  
Crafting Spatiality  
WeE 3 General Session  
Glass Structures |
| 17:30 – 18:00 | Presentation of the Associated Event – The Bones of Architecture – An exhibition on design practices  
(Auditorium 2) |
| 19:30 – 22:30 | Visit to the exhibition  
“The Bones of Architecture” & Welcome Reception  
(Centro Cultural de Belém) |

**Thursday, July 25, 2019**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
</table>
| 08:30 – 19:00 | Conference Accreditation  
ICSA2019 Desk – Calouste Gulbenkian Foundation / Congress Centre |
| 09:00 – 10:00 | Keynote Lectures  
(Auditorium 2) |
| 10:00 – 10:30 | Coffee Break |
| 10:30 – 12:00 | ThM 1 General Session  
Comprehension of complex forms & Concept architectural buildings  
ThM 2 General Session  
Innovative architectural and structural design (2)  
ThM 3 General Session  
Other & Lightweight and membrane structures |
| 12:30 – 14:00 | Lunch Break |
| 14:00 – 15:30 | ThA 1 General Session  
The tectonic of architectural solutions (1)  
ThA 2 General Session  
The borderline between architecture and structural engineering (1)  
ThA 3 General Session  
Tall buildings |
| 15:30 – 16:30 | ThE 1 General Session  
The tectonic of architectural solutions (2)  
ThE 2 General Session  
The borderline between architecture and structural engineering (2)  
ThE 3 General Session  
Educating architects and structural engineers (1) |
| 16:30 – 17:00 | Coffee Break |
| 17:00 – 17:30 | General Meeting – International Association of Structures and Architecture  
(Auditorium 2) |
| 20:00 – 23:00 | Gala Dinner  
(Casino de Lisboa – Restaurante Beltejo) |
Friday, July 26, 2019

09:30 – 17:00  Conference Accreditation  ICSA2019 Desk  Calouste Gulbenkian Foundation / Congress Centre

10:00 – 10:30  Keynote Lecture  (Auditorium 2)

10:30 – 12:30  FrM 1 General Session  Timber structures  FrM 2 General Session  Concrete and masonry structures  FrM 3 General Session  Educating architects and structural engineers (2)

12:30 – 14:00  Lunch Break

14:00 – 15:30  FrA 1 General Session  Building envelopes (1)  FrA 2 General Session  Steel and composite structures & Structural design challenges  FrA 3 General Session  Educating architects and structural engineers (3)

15:30 – 16:00  Coffee Break

16:00 – 17:30  FrE 1 General Session  Building envelopes (2)  FrE 2 General Session  Computer and experimental methods  FrE 3 General Session  Educating architects and structural engineers (4)

17:30 – 18:00  Closing Ceremony  (Auditorium 2)