

# SOFTENING THE HABITATS

SUSTAINABLE INNOVATION IN MINIMAL MASS STRUCTURES AND LIGHTWEIGHT ARCHITECTURES

Save the date: **June 3-5, 2019, Milan, Italy**

**#TS19softeningthehabitats**

**#TS19conf**

**#TS19exhib**

***The TensiNet Association's international event is going to be held in Milan, Italy in 2019! Get ready for three immersive days focused on what's new and ongoing in textiles and polymers, lightweight structures, construction engineering, architecture and design.***

The 6th International TensiNet Symposium "*Softening the Habitats: Sustainable Innovations in Minimal Mass Structures and Lightweight Architectures*" will take place from the 3<sup>th</sup> to the 5<sup>th</sup> of June 2019 at Politecnico di Milano, in Milan, Italy.

The 2019 TensiNet Symposium (TS19) is organized and hosted by the TensiNet Association and in particular by Politecnico di Milano (PoliMi) and Textile Hub, which is an interdepartmental research laboratory on textiles and polymers at PoliMi.

The 2019 TensiNet edition will open a twofold reflection - by means of both **the conference (TS19Conf) and exhibition (TS19Exhib)** - on current innovations, trends and strategies in the field of lightweight membrane structures and mainly on the future of those technologies, which the TensiNet Association is interested in: tensile and pneumatic structures, textile architecture, membranes and foils, ultra-lightweight constructions and structural skins.

## **The main theme of 2019 edition: Softening the Habitats**

Lightweight structures have been regularly applied in the field of human construction, and have been so for more than ten thousand years. They have recently seen a considerable expansion due to the promising prospects that they offer, accounting for a larger proportion of the overall volume of buildings. The last few decades have brought numerous significant innovations in terms of materials, design and computation tools, as well as construction detailing and installation methodology. As a consequence of such innovative applications, membrane construction now has an established place in the field of Architecture. However, some imperative questions arise. At what stage of development are the best built examples today? How will textile architecture evolve in the near future? Can we expect any major innovations in this area? What part of our imagination still remains to be explored today? Will current technical advancements in materials production lead to lighter and more efficient structures and to greater environmentally sustainable enclosures? What is the biggest challenge of the next few decades in the field of tent construction? Can we envision a future where unknown durable and recyclable materials will contribute to decrease the current conflicts between society and nature?

Three mornings of inspiring keynote lectures plus a number of plenary sessions, followed by just as many afternoons of open panel discussions and parallel sessions will create a very special event where experts in the areas of membrane architecture and engineering, as well as researchers and industry representatives are invited to contribute to constructive debates on soft structures, softening the environment and soft skins.

## **The Conference**

The current regulatory and operative frameworks require designers, researchers and industry executives to systematically consider the theme of societal, economical and environmental sustainability as a pivotal point of their work. Thus, the conference will focus on how building technologies on membranes are being more and more directed towards achieving a smaller environmental footprint and obtaining more resilient cities and landscapes. Worldwide, the lifestyle is increasingly characterized by requirements of flexibility, speed and dematerialization. Further applications of lightness and findings could be foreseen and experimented in the field of extreme living structures, meaning on one side the structures of post-emergency recovery, that have to perform requirements of speed, low-budget and modularity. On the other side, the design of structures for outer space, that need to perform high-tech requirements, in an opposite way, for the extreme living. In this regard, the TensiNet 2019 symposium will host a number of panel discussions in order to develop synergies among all experts of the sector, who will be united to redefine the aesthetic and functional principles of today's and tomorrow's textile architecture. Nevertheless, the conference will also propose to deeply reflect on the theme of lightness in architecture, as well as how lighter constructions can potentially generate novel ideas on habitats.

## **The Exhibition**

The exhibit will start one week prior to the conference and it will show an exhaustive picture of responsibilities at various levels – academia, industries, practitioners, construction sector and standards – acting on tensile, membrane and foil constructions in Europe and worldwide. The aim of the exposition is first and foremost to support the role of the TensiNet Association as a disseminator of information at the regional level and amplifying it to the global scale, and vice-versa.

With the aim to unite academics, industry representatives and leaders in the topic of lightweight material innovations, tools and field advancements, the exhibition is expected to generate new synergies among professionals and to envision brand new perspectives and outlooks within academia and industries.

Eventually, a deeper understanding of the latest, most emblematic tensile constructions and of the different team collaborations on these specific projects will provide an unprecedented mapping of information and material flows. In this way, the exhibit will be promoting knowledge on recent innovations related to the environmental mitigation and adaptation towards more sustainable materials in textile architecture. This knowledge will be spread among between TensiNet members and all new visitors, while opening discussion and directing the field to the circular economy approach.

## **What are the details of the 6<sup>th</sup> TensiNet Symposium 2019 edition?**

The 2019 TensiNet Symposium event is structured as follows:

- Three Plenary Sessions: Soft Structures, Softening the Environment, Soft Skins;
- Three Academia vs Industry roundtable open Discussion (AID) Sessions, linked to the Exhibition;
- Nine Parallel Sessions on special technical issues, reviews of State of the Art and case studies.

The three plenary sessions will envisage new ways for softening the habitats thanks to inspiring keynote topics, disruptive mind-sets and design methodologies, innovative technologies and advanced manufacturing in the fields of social and environmental sciences and in the field of engineering and construction.

### **1. SOFT STRUCTURES**

In this session, the future frontiers of tensile membrane structures will be explored thanks the involvement of a variety of disciplines and perspectives. The concept of lightness will shift its essence from vision to

necessity, from shape to matter, while lightweight structures will have to become fully energy-saving, efficiently load-bearing and, last but not least, carrying on novel concepts of beauty, flexible functions and adaptive structures. The summary of key topics of the *Soft Structures* Plenary Session is:

- **Structural Lightness:** form-finding, structural analysis, design and optimization, construction phases
- **Structural efficiency:** “doing more with less”
- **New materials, unpredictable shapes:** identifying reliable structures
- **Metal free structures, hybrid structures**
- **Detailing and installation**

The following main sub-topics will be explored during the first day of conference:

- AID Session: Best practices and learning from failures
- Parallel Session 1: **Pneumatic structures and inflatable structures**
- Parallel Session 2: **Demountable structures and emergency shelters**
- Parallel Session 3: **Kinetic and kinematic structures**

## 2. SOFTENING THE ENVIRONMENT

This session will focus on the pivotal role of designing, manufacturing and building architectures, structures and landscapes and their impacts on global sustainability challenges. The second day’s main goal is to draw the attention to measuring the quality of current and future lightweight constructions in terms of environmental efficiency, user’s comfort, materials and building products’ durability and end-life scenarios.

The summary of key topics of the *Softening the Environment* Plenary Session is:

- **Weight reduction opportunities in design and manufacturing**
- **Material selection strategies in lightweight industry and in lightweight construction**
- **Standard regulations, sustainability targets for the next textile architecture**
- **Production methods** and challenges faced throughout the process
- **Environmental product declaration and Life Cycle Assessment Methodology**

The following main sub-topics will be explored during the second day of the conference:

- AID Session: **Sustainability and Comfort**
- Parallel Session 1: **Design & Simulation**
- Parallel Session 2: **Analysis and testing**
- Parallel Session 3: **Performances assessment**

## 3. SOFT SKINS

The last day of the conference will be devoted to the crucial and challenging topic of living structures. We have been long wishing for unwoven, seamless, elastic and durable materials, such as a kind natural fleeces and thin shells. Further basic researches and outstanding practices are leading the development of novel resilient structures and adaptive skins, which will be able to perform a next generation of human constructions. The summary of key topics of the *Soft skins* Plenary Session is:

- **Novel aesthetics**
- **Material and light effects**
- **Designing with advanced lightweight materials**
- **Solar design and daylighting optimization**
- **Energy active skins**
- **Energy/thermal management**

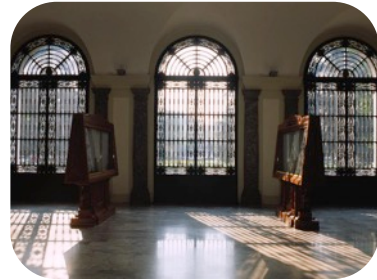
- **Sound insulation**
- **Detailing and installation**

The following main sub-topics will be explored during the third day of conference:

- AID Session: **New requirements and advanced materials**
- Parallel Session 1: **Adaptive envelopes**
- Parallel Session 2: **Extreme living structures**
- Parallel Session 3: **Large-span transparent enclosures**

## Symposium Venue

Politecnico di Milano, Piazza Leonardo da Vinci, 32, 20133 Milan, Italy



## Milan Tour

The 2019 TensiNet Symposium will allow conference attendees to explore some of the most beautiful and innovative architecture in the world through a number of expertly curated, architect-led tours that will take you to explore Milan's local architecture and tourist attractions.



## Textiles Hub technical visit

Visit the PoliMi Textile Hub to see previous, current and future contributions to lightweight research.



## Social Dinner

A social dinner gathering will take place in one of Milan's location to enjoy authentic Milanese dishes all while networking and meeting attendees from all around the world!

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For more information, please contact us at:

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The official hashtag of 2019 Tensinet symposium “Softening the Habitats” is:  
#TS19softeningthehabitats