



**THE 6TH TENSINET
SYMPOSIUM 2019
MILAN, ITALY
3-5 JUNE**

**SCIENTIFIC
PROGRAM
OF THE
CONFERENCE**

DRAFT

draft version
updated 18.5.2019



SOFTENING THE HABITATS

SUSTAINABLE INNOVATION IN MINIMAL MASS STRUCTURES AND LIGHTWEIGHT ARCHITECTURES

MORNING PLENAR SESSIONS

coffee break

10.30
10.45

lunch break

01.00
01.45

AFTERNOON PARALLEL SESSIONS

coffee break

4 pm

social
events

where: BUILDING 11, Room E.N.Rogers - 2 Ampère Street

9.00
9.20

Welcome

9.20
12.45

SOFT STRUCTURES

12.45
1.00

IN.TENSION
Exhibition Opening

PROTOTYPES IN COURTYARD'S

2 pm
3.40

DESIGN & SIMULATION
OF SOFT STRUCTURES

4 pm
5.40

DESIGN & SIMULATION
OF SOFT STRUCTURES

BUILDING 5, Beltrami Room - 32 Leonardo da Vinci Square

2 pm
3.40

AIR-SUPPORTED &
PNEUMATIC STRUCTURES

4 pm
5.40

DEMOUNTABLE
STRUCTURES

FIELD
TRIPS

6 pm
8 pm

where: BUILDING 11, Room E.N.Rogers - 2 Ampère Street

9.00
12.40

SOFTENING THE ENVIRONMENT
with JOINED IASS WG18

TEMPORATIVE PAVILLION

2 pm
4.25

PERFORMANCES
& RELIABILITY OF
SOFT MATERIALS

4.30
6 pm

Plenary OPEN TALK
Industry - Academy

BUILDING 5, Beltrami Room

2 pm
4.25

TOWARDS NEW
MATERIALITIES
& SOFT SPACES

6 pm
6.50

TensiNet Partners
Meeting

POLIMI
LABS visit

6 pm
6.50

SOCIAL
DINNER

8 pm

where: BUILDING 11, Room E.N.Rogers - 2 Ampère Street

9.00
12.45

SOFT SKINS

IN.TENSION EXHIBITION

2 pm
5.30

SOFT SKINS FOR THE BUILT ENVIRONMENT

BUILDING 5, Beltrami Room - 32 Leonardo da Vinci Square

2 pm
5.30

THERMAL, OPTICAL & ACOUSTIC COMFORT

5.30 Conclusion
6.30 Greetings

& communication
of the selected
papers for
AEDM Journal

Building 11, Rogers Room

2019 JUNE
Monday the 3rd

Building 11
E.N. Rogers Room
2 Ampère Street

9.20
12.45

Building 11
Catering Area

10.40
11.00

Courtyard Buildings 3
Leonardo Da Vinci Square

1.00
1.45

9.00-9.20 am | **Welcome**

*Stefano Della Torre, Dept. of Architecture, Built Environment
and Construction Engineering, Politecnico Milano
Laura Daglio, Italian Society of Technology of Architecture*

Introduction of the 6th TensiNet Symposium

*Alessandra Zanelli and Carol Monticelli, Scientific Committee
Marijke Mollaert and Bernd Stimpfle, TensiNet Board*

Plenary Session | Chair persons:

Marijke Mollaert, Bernd Stimpfle

9.20 - 10.00 am | **Invited Keynote speech**

**Moveable membranes - smart solutions in the
field of architecture**

Christoph Paech, Schlaich Bergermann partner

10.00 - 10.40 am | **Invited Keynote speech:**

New hybrids

Julian Liehnard, Str.ucture GmbH

| **COFFEE BREAK**

11.00 - 11.30 am

INNOCHAIN ETN project

Martin Tamke

11.30 - 11.55 am

Tension-Actuated Textiles for Architecture

*Timothy Liddell, Isabella Flore, Massimo Fontana,
Nina Romanova, Mahsa B. Zamani, Nataliia Antonenko, Haykaz
Poghosyan*

11.55-12.20 am

**Cable Erection of Adana Stadium Suspended
Roof - Turkey**

Emanuela Di Muro, Daniela Lombardini

12.20-12.45 am

Teaching Membrane Architecture

Robert Roythmair

12.45 - 1.00 pm

Opening the IN.TENSION Exhibition

Elpiza Kolo

| **LUNCH BREAK**

PARALLEL SESSION 1.1

(20 minutes of speech + 5 min. of discussion)

2019 JUNE
Monday the

3rd

PARALLEL SESSION 1.2

(20 minutes of speech + 5 min. of discussion)

Building 5 | Castigliano Room | 32 Da Vinci Square

2 pm
3.40

DESIGN AND SIMULATION OF SOFT STRUCTURES

Chair persons: Natalie Stranghöner and Martin Tamke

An algorithm to draw simulations of dynamic lightweight structural systems with schemas

Mesrop Andriasyan

Pre-stressed cable truss with stiffening girder and design clearance: development and analysis

Vitalii Vitalievich Mikhailov, Andrei Vladimirovich Chesnokov, Ivan Victorovich Dolmatov

Numerical technique for estimation of cable roof structural parameters

Andrei Vladimirovich Chesnokov, Vitalii Vitalievich Mikhailov

Pressure coefficient distributions for the design of hypar membrane roof and canopy structures

Jimmy Colliers, Marijke Mollaert, Joris Degroote, Lars De Laet

COFFEE BREAK

3.40
4 pm

Building 5 | Castigliano Room | 32 Da Vinci Square

DESIGN AND SIMULATION OF SOFT STRUCTURES

Chair persons: Natalie Stranghöner and Martin Tamke

Systems for transformative textile structures in

CNC knitted fabrics - Isoropia

Mette Ramsgaard Thomsen, Yuliya Sinke Baranovskaya, Filipa Monteiro, Julian Lienhard, Riccardo La Magna, Martin Tamke

Bending-active frame: analysis and estimation of structural parameters

Andrei Vladimirovich Chesnokov, Ivan Victorovich Dolmatov, Vitalii Vitalievich Mikhailov

Integration of form-finding, analysis process and production of a bending active textile hybrid into one model

Rens Vorstermans, Jasper Van Wijk, Patrick Teuffel, Arjan Habraken, Rogier Houtman

Lightweight structures, heavy foundations?

Ramon Sastre, Xavier Gimferrer

SOCIAL EVENTS

6 pm
8 pm

Building 5 | Beltrami Room | 32 Da Vinci Square

PNEUMATIC/ AIR-SUPPORTED STRUCTURES

Chair persons: Josep Llorens and Jean-Christophe Thomas

Powerful Tools for Formfinding, Statics and Patterning of Pneumatic Structures

Dieter Ströbel, Jürgen Holl

Inflatable beams subjected to axial forces

Anh Le Van, Jean-Christophe Thomas

Atrium Roof in the new Lilienthalhaus in Brunswick, Job Report

Bernd Stimpfle, Michael Schäffer

“Auditorium 1919 Sacmi” Evaluation of the technological performances in the design phase of the walls and roof sub-system realized with ETFE cushions

Beniamino Di Fusco, Andrea Angeleri

COFFEE BREAK

Building 5 | Beltrami Room | 32 Da Vinci Square

DEMOUNTABLE STRUCTURES

Chair persons: Josep Llorens and Jean-Christophe Thomas

Anchoring emergency lightweight shelters

Josep Ignasi De Llorens Duran, Daniel Ledesma

Finite element analysis and design optioneering of an emergency tent structure

Salvatore Viscuso, Carol Monticelli, Alessandra Zanelli

Innovation Refugee Shelter Design with Pneumatic Sandwich Structure

Nuerxiati Atawula, Alessandra Zanelli, Carol Monticelli, Carlotta Mazzola

Manta Bay, the pool in textile architecture

Alessandro Rizzo, Roberto Canobbio, Francesco Benzi

FIELD TRIP A. Historical and Modern Architecture

FIELD TRIP B. Contemporary Architecture

2019 JUNE 4th
Tuesday the

Building 11
E.N. Rogers Room
2 Ampère Street

9.00
12.55

Building 11
Catering Area

10.20
10.40

Courtyard & Porticos
of Buildings 3
Leonardo Da Vinci Square

1.00
1.45

Plenary Session | Chair persons: Carol Monticelli and Peter Gosling

9.00 - 9.40 | Invited Keynote speech:
Innovative sustainability solutions in the
Grimshaw & Partners Projects
Neven Sidor, Grimshaw London

9.40 - 10.20 am | Invited Keynote speech:
Biomimicry for regenerative built environments
Maibritt Pedersen Zari, School of Architecture, Victoria University of Wellington

| COFFEE BREAK

10.40 - 11.00 am | Introduction to the
JOINED IASS WG18 SEMINAR:
ENVIRONMENTAL COMPATIBLE MEMBRANE STRUCTURES
Chairpersons: Carol Monticelli and Petr Vegh

11.00 - 11.40 am | Invited Keynote speech (IASS WG18):
Structure and Space of Serendipity Brought by Materials for
Art
Norihide Imagawa, Surgical Architect/ Director of TIS&PARTNERS. Co., Ltd. Honorary Professor of Tokyo Denki University

11.40 - 12.05 am
Softening the environments: is there anything like
an environmentally compatible membrane?
Katja Bernert

12.05 - 12.30
Eco-design principles for a preliminary eco-efficiency
assessment in the design phase: application on membrane
envelopes
Carol Monticelli, Alessandra Zanelli

12.30 - 12.55
Development and testing of a new glass fibre reinforced
fluoropolymer membrane
Maxime Durka

| LUNCH BREAK

PARALLEL SESSION 2.1

(20 minutes of speech + 5 min. of discussion)

2019 JUNE
Tuesday the

4th

PARALLEL SESSION 2.2

(20 minutes of speech + 5 min. of discussion)

Building 5 | Castigliano Room | 32 Da Vinci Square

2 pm
4.25

PERFORMANCES AND RELIABILITY OF SOFT MATERIALS

Chairpersons: Marijke Mollaert and Peter Gosling

Increasing the safety of tensile structures

Heidrun Bögner-Balz, Jochen Köhnlein, Rainer Blum

Reliability-based analysis of a cable-net structure designed using partial factors

Elien De Smedt, Marijke Mollaert, Maarten Van Craenenbroeck, Robby Caspeelee, Lincy Pyl

Strain Rate Dependent Tensile Strength of PTFE Fabric by Strip Method

Kübra Talak

Architectural woven fabrics: Is it possible to classify stiffness values in correlation with strength values?

Jörg Uhlemann, Natalie Stranghöner

Uniaxial Strip and Grab Test Methods for Tensile Testing of Architectural Fabrics

Hastia Asadi, Jörg Uhlemann, Natalie Stranghöner

Experimental assessment and interpretation of biaxial material parameter variation of a polyester-PVC fabric

Maarten Van Craenenbroeck, Lars De Laet,

Elien De Smedt, Marijke Mollaert

COFFEE BREAK

4.30
4.45

COFFEE BREAK

Building 5 | Beltrami Room | 32 Da Vinci Square

TOWARDS NEW MATERIALITIES AND SOFT SPACES

Chairpersons: Alessandra Zanelli and Günther Filz

Soft Spaces: Hybrid systems from structural membranes and conventional building technologies

Günther H. Filz, Gerry D'Anza

TemporActive Pavillion: first loop of design and prototyping of an ultra-lightweight temporary architecture

Carlotta Mazzola, Bernd Stimpfle, Alessandra Zanelli, Roberto Canobbio

Achieving complex bending-active structures from flexible planar sheets. Hybrid structure introducing the use of spacer fabrics in architectural field

Elena Kriklenko

Computational Knitting in architecture: an Experimental Design Process for Performative Textile System

Ingrid Paoletti, Elena Brigitte Clarke, Andrea Giglio

FlexHab

Edoardo Marcandelli, Nicola Giulietti, Francesca Perego,

Eleonora Teruzzi, Eleonora Valle

PLENARY SESSION

Building 3
First Floor
Aula Magna

4.45
6 pm

OPEN TALK |

Chairpersons:
Katia Bernert and all the WG leaders

Academy / Industry open discussion dealing with the main

Working Groups themes of TensiNet Association: WG Analysis & Materials

| WG ETFE | WG Specifications & Eurocode | WG pneumatic structures |

WG sustainability & comfort | WG good practice

Building 3
First Floor
Aula Magna

6 pm
7 pm

TENSINET PARTNER MEETING

Only for TensiNet Associated Members

SOCIAL EVENTS

6 pm
7 pm

7.45

POLIMI LABS visit

SOCIAL DINNER at Castello Sforzesco, Elephant Frescoes Porticos, Ducal Courtyard (including Da Vinci room free visit, 7.45-8.15 pm)

2019 JUNE
Wednesday 5th

Building 11
E.N. Rogers Room
2 Ampère Street

9.00
12.55

Building 11
Catering Area

10.20
10.40

Courtyard & Porticos
of Buildings 3
Leonardo Da Vinci Square

1.00
1.45

Plenary Session | Chair persons:
Alessandra Zanelli, Julian Lienhard

9.00 - 9.40 am | Invited Keynote speech:
Transformative Textile Architecture
Mette Ramsgaard Thomsen, Head of Centre for IT and Architecture - CITA, Royal Academy of Fine Arts

9.40 - 10.20 am | Invited Keynote speech:
Novel Composite Building System inspired by Nature
Jan Knippers, Head of the Institute for Building Structures and Structural Design- ITKW, University of Stuttgart

| **COFFEE BREAK**

10.40 - 11.05 am
A tensile screen for the windows of Castello Sforzesco: integrating anemometric, optical and mechanical tests in the early-stage design of bespoke textile hybrid structures in historical contexts
Alessandra Zanelli, Elpiza Kolo, Carol Monticelli, Elisabetta Rosina, Tiziana Poli, Alberto Speroni, Andrea Giovanni Mainini

11.05 - 11.30 am
Textil Akademie Mönchengladbach, Job Report
Bernd Stimpfle, Jürgen Trenkle

11.30 - 11.55 am
The tailored interior skin of Nuvola, Rome
Roberto Canobbio

11.55-12.20 am
Lightweight and durable materials for thermal, acoustical and illuminance performance of building envelopes
Philippe Lussou

12.20-12.45 am
Coating of ETFE - solar shading for architectural applications
Carl Maywald

| **LUNCH BREAK**

PARALLEL SESSION 3.1

(20 minutes of speech + 5 min. of discussion)

2019 JUNE
Wednesday

5th

PARALLEL SESSION 3.2

(20 minutes of speech + 5 min. of discussion)

Building 5 | Castigliano Room | 32 Da Vinci Square

2 pm
5.40

SOFT SKINS FOR THE BUILT ENVIRONMENT

Chairpersons: Adriana Angelotti and Carol Monticelli

Optimization of a membrane structure design for existing project of children's playground in the city of Krupina
Vojtech Chmelik, Jozef Kuran, Monika Rychtáriková

Static assessment of selected transparent and translucent designs of roof over railway exposition

Eva Vojtekova, Matus Turis, Michal Vanek, Olga Ivankova

Casa Corriere - RCS Media Group pavilion for Expo 2015

Paolo Beccarelli, Monica Armani, Roberto Maffei

Textile architecture: "dressing the Aurelian walls"

Maria Federica Ottone, Alessandra Zanelli, Dajla Riera

COFFEE BREAK

3.40
4 pm

Application of Atrium Tensile Structure in Historic Building. Case study: Daylight Modeling of Atrium within Historic Building.

Beata Polomová, Peter Hanuliak, Andrea Vargová

Exploring fog harvesting nature based solution tensile membrane structures towards sustainable development in the Italian urban context

Gabriela Fernandez, Gloria Morichi, Lucas Bandeira Calixto

A lightweight textile device for urban microclimate control and thermal comfort improvement: concept project and design parameters.

Anna Cantini, Adriana Angelotti, Alessandra Zanelli

PLENARY SESSION

Building 11
E.N. Rogers
2 Ampère Street

5.30
6 pm

Building 5 | Castigliano Room | 32 Da Vinci Square

THERMAL, OPTICAL AND ACOUSTIC COMFORT

Chairpersons: Monika Rychtáriková and Giorgio Novati

Building Integrated Photovoltaic (BIPV) with ETFE-Films
Moritz Karsten

Extreme Soft Skins: Multi-layered ETFE for Challenging Environments

Nebojsa Jakica, Alessandra Zanelli

Thermal performance of pneumatic cushions: an experimental evaluation

Andrea Alongi, Adriana Angelotti, Alessandro Rizzo, A. Zanelli

Assessment of building Physical Aspects of a New Angular Selective 3D - Prototype Foil (ETFE)

Jan Cremers, Hannes Marx

COFFEE BREAK

Impact of Technical Textile Envelops on the Perception of Indoor Comfort in Minor Sports Facilities

Aldina Silvestri, Teresa Villani

Audiovisual comfort in shopping streets covered by structural skins

Monika Rychtarikova, Richard Šimek, Paulína Šujanová, Jarmila Húsenicová, Vojtech Chmelik

Energy performance of film membranes in the retrofitting of Architectural Heritage: an Italian case study

Mariangela De Vita, R. D'Antonio, Paolo Beccarelli, P. De Berardinis

CONCLUSION | Outlooks, Thanks and Greetings

Communication on the selected papers for the special issue of the International journal of Special Issue of the "Architectural Engineering and Design Management" international journal.

*Alessandra Zanelli and Carol Monticelli,
Marijke Mollaert and Bernd Stimpel*



SOFTENING THE HABITATS

SUSTAINABLE INNOVATION IN MINIMAL MASS STRUCTURES AND LIGHTWEIGHT ARCHITECTURES

SCIENTIFIC COMMITTEE

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LOCAL ORGANIZATION

Anna Cantini, Gabriela Fernandez,
Elpiza Kolo, Carlotta Mazzola,
Carol Monticelli, Alessandra Zanelli



BUILDING 11

2 Ampère Street

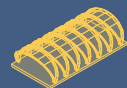
Plenary Sessions - E.N.Rogers Room
"Guido Nardi" Exhibition Room

BUILDING 1

32 Leonardo Da Vinci Square

OPEN -TALK

Aula Magna of Rectorate
first floor



TA

TEMPOR-ACTIVE Pavilion

32 Leonardo Da Vinci Square

Sponsors & Supporters Pavilion

BUILDING 3 Courtyard & Porticos

32 Leonardo Da Vinci Square

Lunch & Afternoon Coffee Breaks

BUILDING 5

32 Leonardo Da Vinci Square

Paraller Sessions Castigliano Room

Parallel Sessions Beltrami Room





THE 6TH TENSINET SYMPOSIUM
3-5 JUNE 2019
MILAN, ITALY

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