

RESEARCH

## CANOPY WOLKE MARIENFELD

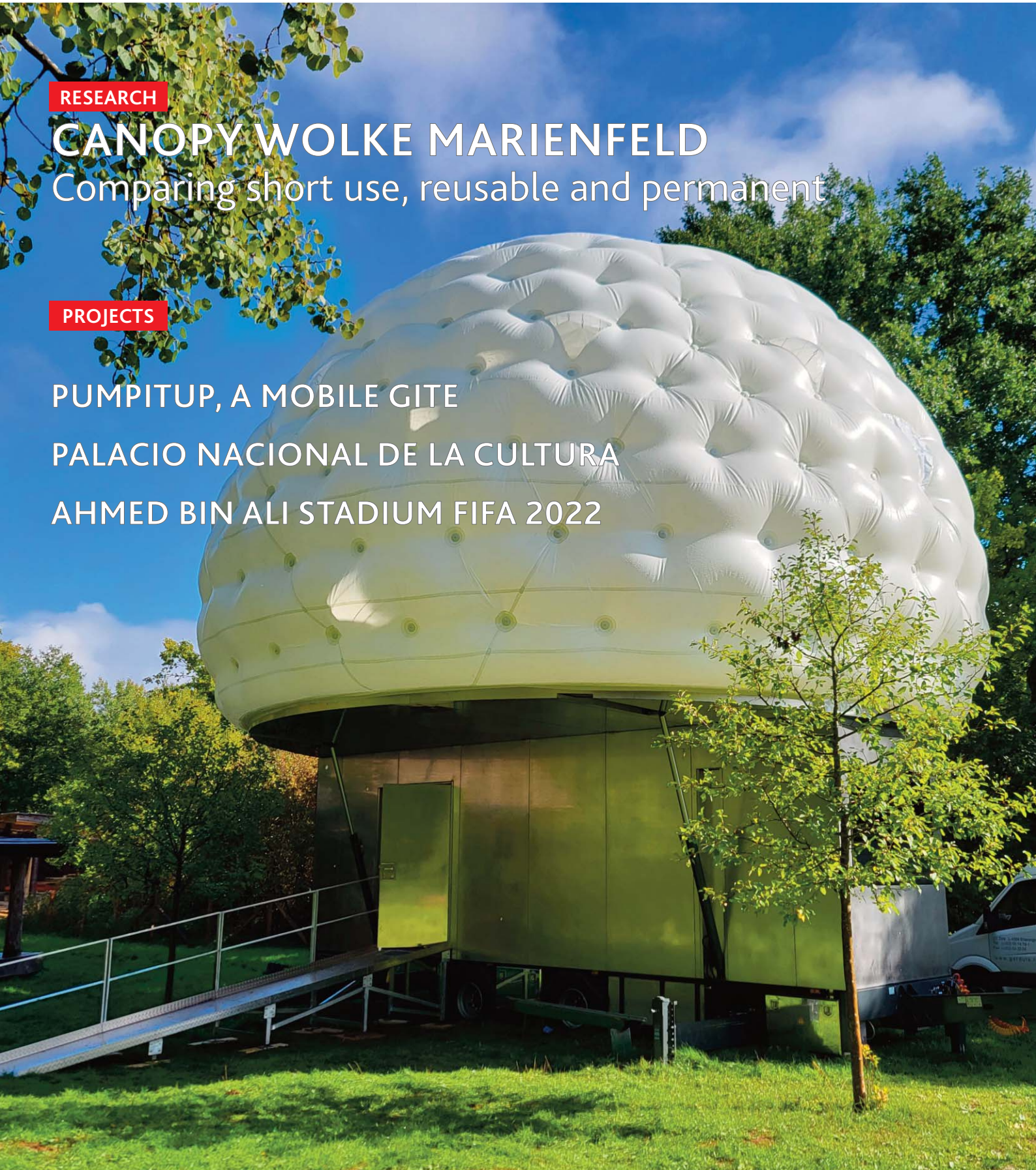
Comparing short use, reusable and permanent

PROJECTS

PUMPITUP, A MOBILE GITE

PALACIO NACIONAL DE LA CULTURA

AHMED BIN ALI STADIUM FIFA 2022



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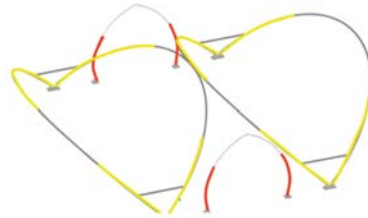
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## TENSINANTES2023

MEMBRANE ARCHITECTURE: THE SEVENTH ESTABLISHED BUILDING MATERIAL.  
DESIGNING RELIABLE AND SUSTAINABLE STRUCTURES FOR THE URBAN ENVIRONMENT.

**WEDNESDAY 7<sup>TH</sup> JUNE**

- 08.30-09.15 Registration
- 09.15-09.30 Welcome & Introduction
- 09.30-10.30 Keynote lecture  
**Bouncing Bridge: ephemeral, autonomous and self-supporting pneumatic temporary structure**  
Grégoire Zündel and Ramon Sastre
- 10.30-10.50 Coffee break
- 10.50-12.55 Lectures
- 13.00-14.00 Lunch break
- 14.00-16.05 Lectures
- 16.05-16.25 Coffee break
- 16.25-17.05 Lectures
- 17.05-18.05 Keynote lecture  
**Architecture in motion**  
Louis Ratajczak
- 18.05-20.00 **Cocktail drink**

**THURSDAY 8<sup>TH</sup> JUNE**

- 09.00-10.00 Keynote lecture **The Pathways to Zero Carbon for Tensioned Membrane Architecture: ongoing actions and next steps**  
Bruce Danziger and Carol Monticelli
- 10.00-10.20 Coffee break
- 10.20-12.25 Lectures
- 12.30-13.30 Lunch break
- 13.30-15.35 Lectures
- 15.40-16.00 Coffee break
- 16.00-17.00 Keynote lecture **Textile Architecture with or versus today challenges in built environment**  
Rosemarie Wagner
- 17.00-19.00 **Walk the green line.**  
Guided walk to the venue of the Gallerie des Machines
- 19.00-23.00 **Conference dinner** at Gallerie des Machines

**FRIDAY 9<sup>TH</sup> JUNE**

- 08.30-10.00 **General Assembly TensiNet association**
- 10.00-11.00 Keynote lecture  
**Milestones of ETFE construction methods and starting points for further developments**  
Karsten Moritz and Jean-Christophe Thomas
- 11.00-11.20 Coffee break
- 11.20-13.00 Lectures
- 13.00-14.00 Lunch break
- 14.00-15.40 Lectures
- 15.40-16.00 Outlooks & Thanks
- 16.00-17.30 **Working Group Sustainability & Comfort** Meeting with invited guest Bruce Danziger

### TensinewsINFO

**Editorial Board**

Paolo Beccarelli, Evi Corne,  
Maxime Durka, Josep Llorens,  
Marijke Mollaert & Carol Monticelli

**Coordination**

Marijke Mollaert,  
[marijke.mollaert@tensinet.com](mailto:marijke.mollaert@tensinet.com)

**Address**

Lombeekweg 26, B1740 Ternat,  
Belgium

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# Edito

Dear Reader

Only a few months from now, second week of June, our next TensiNet Symposium TENSINANTES 2023 "Membrane architecture: the seventh established building material. Designing reliable and sustainable structures for the urban environment" will take place at Nantes Université. Our organizers and the scientific committee have collected a wide range of interesting topics. You find more information in this TensiNews, on the conference website and of course on our TensiNet website. If you have not yet signed in, please take a look to our topics and program. It is worth to join, so don't hesitate. We will have our General Assembly during the symposium in Nantes, and our Sustainability and Comfort working group will also meet there.

This issue of TensiNews is again full of inspiring projects and contributions. Two research projects are presented, a floating membrane roof for storage tanks, and an LCA study about the environmental performance of a temporary structure partially made of reusable steel elements for short term use. You find here also articles about three membrane projects mechanically and pneumatically tensioned. The colleagues of University Duisburg-Essen were so kind to hand in a summary of the fifth Essener Membranbau Symposium, which took place last autumn.

The future Technical Specification for membrane structures prCEN/TS 19102 is now in translation in the different member states in order to be published soon for final voting. We are sure this milestone of standardisation work helps all of us. Please encourage the relevant people in your country to vote positive, or if you are in charge please vote for it.

Please enjoy this issue of TensiNews and I hope to meet you soon in Nantes, or on other occasions this year.

Yours sincerely,  
Bernd Stimpfle



## Forthcoming Events

### The Fiber Society's 2023 Spring Conference |

Fibers for a sustainable world | 15-17/05/2023 |

DITF, Denkendorf, Germany

[www.thefibersociety.org](http://www.thefibersociety.org)



### TENSINANTES2023 – TensiNet symposium at Nantes Université |

Membrane architecture: the seventh established building material. Designing reliable and sustainable structures for the urban environment. |

7-9/06/2023 | Nantes, France

<https://tensinantes2023.sciencesconf.org/>

### ITMA 2023 | Transforming the World of Textiles |

8-14/06/2023 | Milan, Italy

<https://itma.com/>

### IASS 2023 | Integration of Design and Fabrication |

10-14/07/2023 | Melbourne, Australia

<https://www.iass2023.org.au/>

### STRUCTURAL MEMBRANES 2023 |

2-4/10/2023 | Valencia, Spain

<https://structuralmembranes2023.cimne.com>

### Advanced Building Skins Conference & Expo 2023 |

30-31/10/2023 | Bern, Switzerland

<https://abs.green/home>

## TENSINET SYMPOSIUM 2023 AT NANTES UNIVERSITÉ FROM 7<sup>TH</sup> TILL 9<sup>TH</sup> JUNE 2023

### 3 MAIN TOPICS

#### STRUCTURAL MEMBRANE

contemporary, innovative, adaptive daring and impactful solutions

#### TENSIONED MEMBRANE STRUCTURES

the seventh building material

#### STRUCTURAL MEMBRANE

an answer to issues of the 21<sup>st</sup> century

#### FILM

Christo and Jeanne-Claude  
"L'Arc de Triomphe, Wrapped" backstage -  
engineering for a work of art  
by büro für leichtbau, Tritthardt+Richter

### 8 KEYNOTE SPEAKERS

Bruce Danziger - Danziger Engineering

Collaborative, Inc. (US)

Carol Monticelli - Polytechnic of Milan (Italy)

Karsten Moritz - IMS Bauhaus® Archineer®

Institutes e.V. (Germany)

Louis Ratajczak - DVVD (France)

Ramon Sastre - Universitat Politècnica Catalunya  
(Spain)

Jean-Christophe Thomas - Nantes Université  
(France)

Rosemarie Wagner - Building technology Faculty  
of Architecture KIT (Germany)

Grégoire Zündel - Atelier Zündel Cristea (France)

### 5 KEYNOTE LECTURES

- Bouncing Bridge: ephemeral, autonomous and self-supporting pneumatic temporary structure
- Architecture in motion
- The Pathways to Zero Carbon for Tensioned Membrane Architecture: ongoing actions and next steps
- Textile Architecture with or versus today challenges in built environment
- Milestones of ETFE construction methods and starting points for further developments

### 3 SOCIAL EVENTS

Cocktail drink

Walk the green line Guided walk to the "Galerie des Machines"

Conference dinner at the "Galerie des Machines"

### TensiNet General Assembly 2023

The General Assembly will take place on Friday 9 June at 08.30, before the start of the lectures.

### TensiNet Working Group Sustainability & Comfort Meeting

Invited guest Bruce Danziger  
Friday 9 June at 16.00

<https://tensinantes2023.sciencesconf.org/>

# Tensile Cover for playgrounds

## Combining curvy and straight geometry

Pamplona, Spain

During the summer of 2021, following the success of two tensile covers designed and built by Carpas Zaragoza the year before, the Pamplona City Council opened a call for tenders for the design and erection of more covers in selected playgrounds within the city. Despite the challenge of the short deadline for the preliminary design, the Carpas Zaragoza design team came up with a proposal which was awarded with four out of six of the new installations. The City Council required PES/PVC membranes supported on galvanised steel structures, with a design which would minimize the use of inner supports and vandal resistant.

### Design

The playgrounds were both fairly square, with 12mx12m in Azpilagaña and 17mx18m in Buztintxuri. The driving idea behind the design was the combination between curvy and straight geometry, evoking the outline of a white dove. This idea was adjusted to the layout, shapes and height of the existing elements in each playground. The shape in the smaller installation at Azpilagaña was solved with the use of a 13,5m span central arch and six twin legged masts, oriented according to the direction of the forces on the corner.

The philosophy behind the Buztintxuri cover was the same, but given the dimensions, a twin arch arrangement was chosen, where each arc opened to the outside as it gains in height. The supporting

structure was completed with six masts, as in its smaller sister. Each cover was given a white LED lightning installation to enhance the nocturnal aesthetics and increase the availability of the playground during the winter.

Once the preliminary design was approved by the City Council, the Design Team worked on the detail design to release the workshop drawings.

While the civil works were completed on site, manufacturing of the steel structure and the membranes were done in the Carpas Zaragoza facilities, as well as the details assembly (corner plates, etc...), final inspection, folding and packaging. The erection and final touch-ups were carried out by Carpas Zaragoza own personnel.

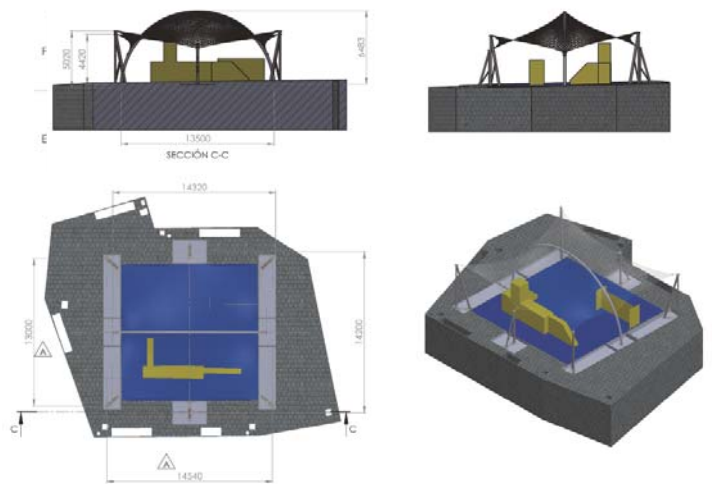


Figure 1. The tensile cover for the playground in Azpilagaña

Figure 2. The tensile cover for the playground in Buztintxuri

✍ Carlos Angulo  
✉ c.angulo@carpaszaragoza.com  
🌐 www.carpaszaragoza.com/



Name of the project:	Tensile Cover for playgrounds
Location address:	Azpilagaña and Buztintxuri neighbourhoods (Pamplona)
Client (investor):	Pamplona City Council
Function of building:	Protection from rain, snow and sunlight
Type of application of the membrane:	canopy
Year of construction:	2022
Design team:	Alex Moliner and Iñaki Ibero
Multi-disciplinary engineering, structural engineer and consulting engineer for the membrane:	Carlos Angulo
Main contractor, manufacture and installation:	Carpas Zaragoza, S.L.
Supplier of the membrane material:	Serge Ferrari
Material:	Serge Ferrari Flexlight Advanced 902 S2
Covered surface (roofed area):	150m <sup>2</sup> (Azpilagaña) + 280m <sup>2</sup> (Buztintxuri)