



Bern University  
of Applied Sciences



# 2023 INTER

## International Network on Timber Engineering and Research – 10<sup>th</sup> INTER meeting 2023

20 – 24 August 2023

Final Program  
Participant Information

## Welcome to Bern University of Applied Sciences in Biel

Dear INTER-Participants,

We are pleased to welcome you to the 10<sup>th</sup> INTER - International Network on Timber Engineering Research meeting. The scope of this annual meeting is presentation, discussion, and documentation of research results in timber engineering and development of application rules for timber design codes or standards related to timber engineering. Following the meeting, in which the theoretical foundations are highlighted, a technical excursion to timber constructions will provide the opportunity to new and old impressions in timber engineering.

## Hosts of 10<sup>th</sup> INTER 2023

Bettina Franke & Steffen Franke

Bern University of Applied Sciences, Biel, Switzerland

## Meeting venue

Bern University of Applied Sciences  
Department of Architecture, Wood and Civil Engineering  
Solithurnstrasse 102, 2504 Biel/Bienne  
Auditorium A0.01

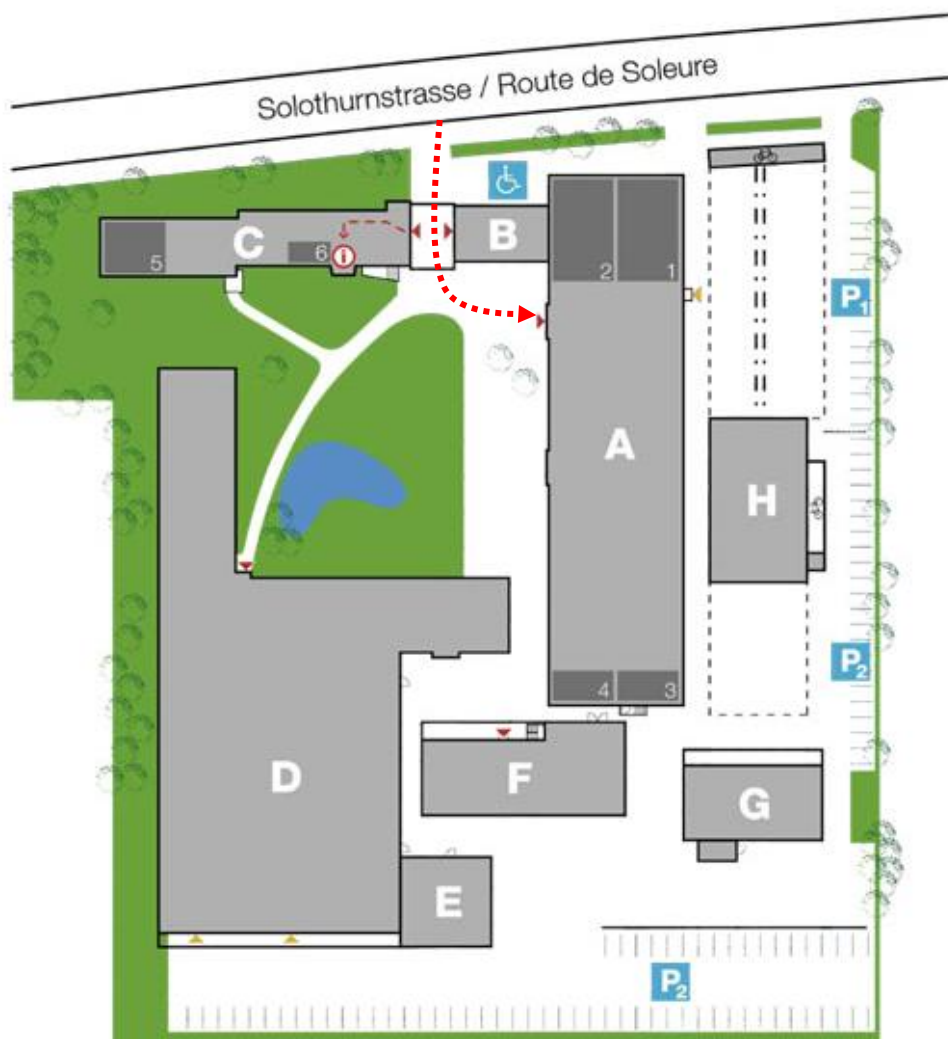
- ▶ Biel/Bienne can be reached easily by direct trains from the three international airports Zurich, Geneva, and Basel within about 1 hour.
- ▶ Limited public parking places are available at the meeting venue (parking fee will apply, see P1 on situation plan). Alternatively, there are parking places available at Tissot Arena. Exit tickets can be purchased at the registration desk. Reduced daily rate CHF 10.-.
- ▶ Public transport is recommended from main station or city centre Biel/Bienne, take bus no. 2 direction "Orpundplatz" (every 10 min) until stop "Zollhaus/Octroi". It takes about 15 minutes + 3 min walk to the meeting venue.

## Information at the venue

- ▶ The registration desk is open during the meeting and will help you with further queries.
- ▶ Please respect, that there is ongoing research work at the campus and the laboratories.
- ▶ Pictures/Movies at the laboratory are not permitted.
- ▶ There is a non-smoking policy within the buildings and laboratories.
- ▶ WLAN access is provided by EDUROAM or using the following Guest login:  
Network: "bfh-open" *after an SMS verification, temporary internet access can be used free of charge*



## Situation Plan, Bern University of Applied Sciences, Biel/Bienne



### A Lecture building

1. Auditorium A0.01
2. Foyer

### B Cafeteria

### C Administration building

- i. Reception
5. Aula
6. Meeting room C (first floor)

### Technology park (D, E & F)

### D Testing laboratory

### E Laboratory and energy centre

### F Laboratory and grinding shop

### G Wood yard

### H Sawmill

## Accommodation

If you have not yet booked your accommodation, we recommend making a reservation at one of the hotels listed below, where we have blocked some rooms:

### MERCURE HOTEL PLAZA BIEL/BIENNE

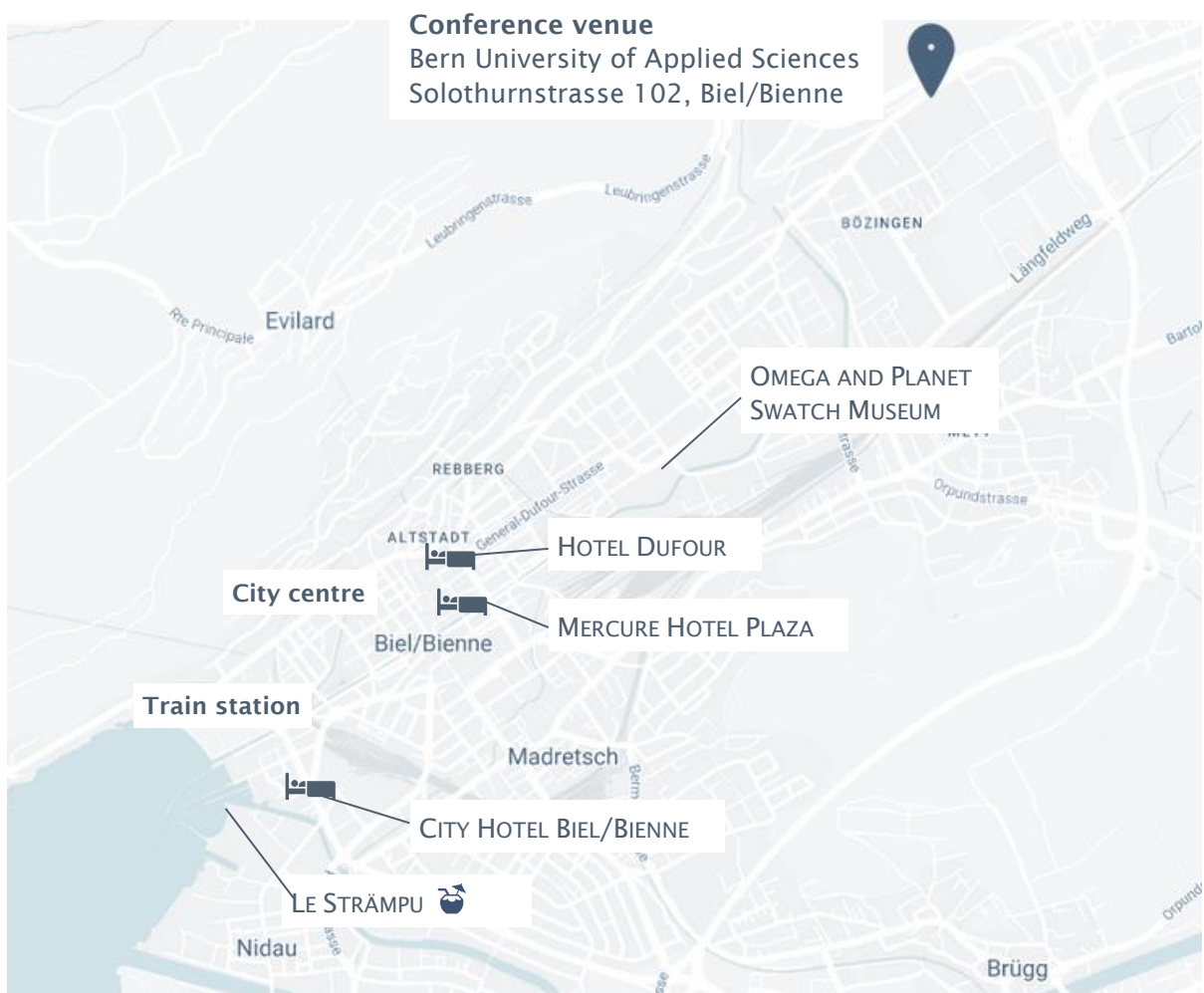
You may book directly with the hotel ([www.accorhotels.com](http://www.accorhotels.com), E-Mail: [H6166-FO@accor.com](mailto:H6166-FO@accor.com)) at the cost of CHF 145 (single room) and CHF 148 (double room) per night, CHF 26 for breakfast. Please refer to the key word INTER Biel 2023.

### CITY HOTEL BIEL BIENNE

You may book directly with the hotel ([www.cityhotel-biel.ch](http://www.cityhotel-biel.ch), E-Mail: [info@cityhotel-biel.ch](mailto:info@cityhotel-biel.ch)) at the cost of CHF 125 per room per night. Please refer to the key word INTER Biel 2023.

### HOTEL DUFOUR

You may book directly with the hotel ([www.hoteldufour.ch](http://www.hoteldufour.ch), E-Mail: [hoteldufour@swissonline.ch](mailto:hoteldufour@swissonline.ch)) at the cost of CHF 95 (Single Room, incl. breakfast) / CHF 150 (Double Room, incl. breakfast) per night. Please refer to the key word INTER Biel 2023.



## Program INTER 2023

- ▶ All times refer to Zurich time (CEST)

### Sunday, 20<sup>th</sup> August 2023

- ▶ Welcome reception, 5.00 to 7.30 pm,  
*Le Strämpu, Lake front, Uferweg 40, 2560 Nidau*

### Monday, 21<sup>st</sup> August 2023

- ▶ 8:30 am INTER Meeting, registration, opening, technical sessions  
*Venue, Bern University of Applied Sciences, Solothurnstrasse 102, Biel/Bienne*

### Tuesday, 22<sup>nd</sup> August 2023

- ▶ 9:00 am INTER Meeting, Technical sessions  
*Venue, Bern University of Applied Sciences, Solothurnstrasse 102, Biel/Bienne*
- ▶ 6:00 to 9.00 pm Technical visit and Apéro  
Omega Museum and Planet Swatch Museum, *Nicolas G. Hayek Strasse 2, Biel/Bienne*

### Wednesday, 23<sup>rd</sup> August 2023

- ▶ 7:30 am Technical Tour
  - Light lunch and coffee breaks will be included during the day
  - Departure Train Station Biel/Bienne, return directly to Meeting dinner
- ▶ 6:00 pm Apéro and Meeting dinner, Swiss Olympic House, Magglingen

### Thursday, 24<sup>th</sup> August 2023

- ▶ 9:00 am INTER Meeting, Technical sessions  
*Venue, Bern University of Applied Sciences, Solothurnstrasse 102, Biel/Bienne*

Recommendations for accompanying person and children are provided on the website.



Source: BFH | [www.omegawatches.com](http://www.omegawatches.com) | [www.biel-seeland.ch](http://www.biel-seeland.ch)

## Welcome reception

Time: Sunday, 20<sup>th</sup> August 2023, 5.00 to 7.30 pm,

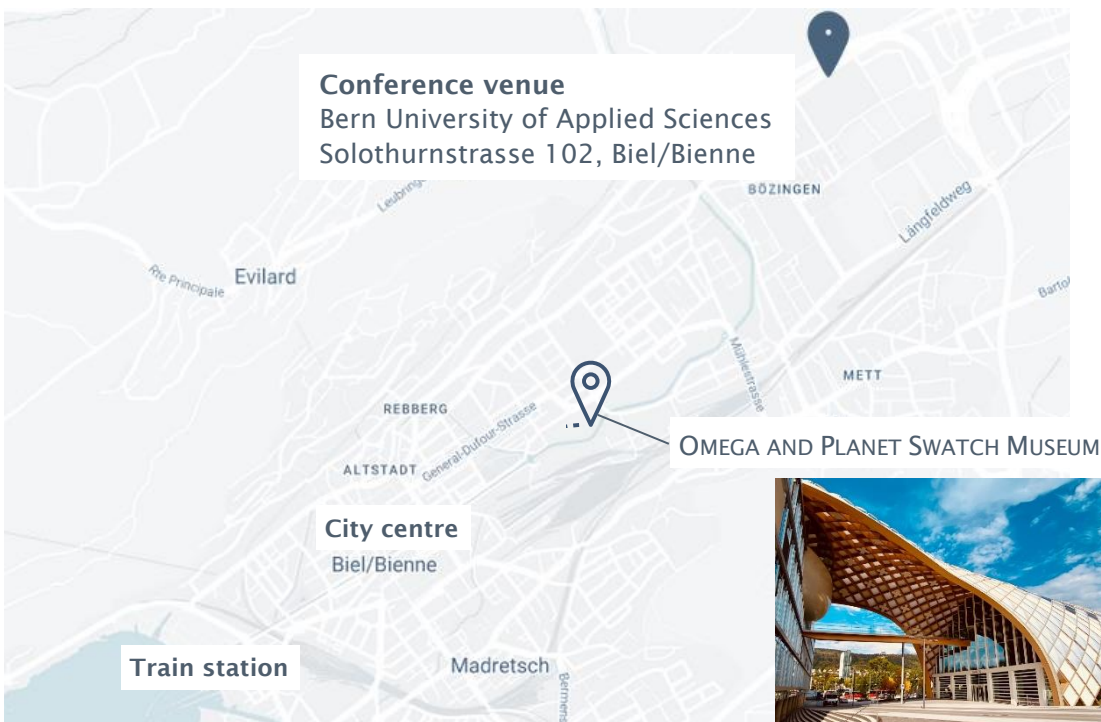
Location: Le Strämpu, Lake front, Uferweg 40, 2560 Nidau



## Visit Omega and Planet Swatch Museum plus Apéro

Time: Tuesday, 22<sup>nd</sup> August 2023, 6.00 to 9.00 pm,

Location: Omega Museum and Planet Swatch Museum, Nicolas G. Hayek Strasse 2, Biel/Bienne







## List of papers

### INTER/CIB POLICY AND MEETINGS

56 - 105 - 1 50 Years INTER/CIB-W18 - **H Blass**

### TIMBER COLUMNS

56 - 2 - 1 Comparison of CLT Buckling Strength Criteria with Experimental Results - **A Narcy, D T Pham, G Forêt, A Lebée**

### STRESSES FOR SOLID TIMBER

56 - 6 - 1 Material Properties of Medium and Dense (Tropical) Hardwoods - **G Ravenshorst, J-W van de Kuilen, A Kovriga**

### TIMBER JOINTS AND FASTENERS

56 - 7 - 1 Withdrawal Properties of Self-Tapping Screws - **C Sandhaas, H Blass**

56 - 7 - 2 Low-cycle Fatigue of Self-Tapping Screws - **S Schwendner, D Kattenbach, W Seim**

56 - 7 - 3 Overstrength of CLT-to-CLT Connections with Inclined Screws - **A Aloisio, D P Pasca, Y De Santis, R Tomasi, M Fragiaco**

56 - 7 - 4 Capacity Model of Inclined Screw Connections with Interlayer - **Y De Santis, A Aloisio, I Gavrić, I Šušteršič, M Fragiaco**

56 - 7 - 5 Adhesive-Bonded Timber-Concrete Composites: Specific Design Aspects - **P Grönquist, K Müller, J Frohnmüller**

56 - 7 - 6 Bonding Behaviour of Grouting Systems and Bending Behaviour of Post-Tensioned Glulam Beams with and without Bonding - **M Muster, T Ehrhart, M Althaus, H-U Küng, P Rogenmoser, K Rahner, A Gnägi, A Frangi**

### DURATION OF LOAD

56 - 9 - 1 Reliability-Based Investigation on the Duration of Load Effect in Timber Structures Under Wind Loads - **X Zheng, C Zhang, F Lam**

### LAMINATED MEMBERS

56 - 12 - 1 A Design Model for Out of Plane Bending of CLT with Consideration of Properties of Lamellas and Finger Joints - **A Olsson, T K Bader**

56 - 12 - 2 Bending Properties out-of-Plane of Cross Laminated Timber (CLT): Test Experience, Model Refinement and Validation - **R Brandner, A Ringhofer, R Sieder, G Schickhofer**

56 - 12 - 3 Punching-shear Strength of Point-Supported CLT Panels - **H Ganjali, T Tannert, Md Shahnewaz, C Dickof, C Slotboom, M Popovski**

56 - 12 - 4 Glulam and LVL Members with Holes – Elevated Shear Stresses at Corners and Condensation of Multiple Close Holes - **S Aicher, S Siby, C Tapia-Camu**

56 - 12 - 5 Improvement of Design Rules in EC5 for Tapered Beams - A Matter of Mechanical Consistency and Competitiveness - **G Hochreiner**

56 - 12 - 6 Lateral Torsional Buckling of Glulam Beams - **J Töpler, U Kuhlmann**

56 - 12 - 7 Dynamic Strength Increase of Glued Laminated Timber Beams Subjected to Impact Loading - **A S Cao, A Frangi**



## STRUCTURAL STABILITY

- 56 - 15 - 1 Design Implications for CLT Shearwalls with Openings - **D Casagrande, G Doudak, R Fanti, A Polastri**
- 56 - 15 - 2 A new method for designing multi-storey segmented CLT walls - **A Smith, S Edvardsen, A Lawrence, R Tomasi**
- 56 - 15 - 3 Cyclic performance of balloon-type CLT shear walls with high-capacity hold-downs - **K Krauss, B Moerman, T Wright, Minghao Li, F Lam**
- 56 - 15 - 4 Enhanced Seismic Performance of Resilient Timber Wall Structures with Innovative Low Damage Floor Connections - **S Assadi, A Hashemi, P Quenneville**

## Fire

- 56 - 16 - 1 Eurocode 5 Revision – Fire Design of Timber Structures - **A Frangi, A Just, J Hakkarainen, J Schmid, N Werther**
- 56 - 16 - 2 Clay and Lime Plaster as Fire Protection for Timber Structures - **J Liblik, A Just**

## Test Methods

- 56 - 21 - 1 Evaluation of Test Methods for CLT Shear Stiffness at Out-of-plane Loading - **E Serrano, H Danielsson**

## Robustness

- 56 - 22 - 1 Experimental and Numerical Analyses of Full-Span and Component Level Subassemblies for Robust Design of CLT Floors - **A Przystup, T Reynolds, T Tannert**

## Structural Design Codes

- 56 - 102 - 1 Finite Element Based Design of Timber Structures - **J Töpler, M Schweigler, R Lemaître, P Palma, M Schenk, P Grönquist, C Tapia, U Kuhlmann**

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