



**XIII  
INTERNATIONAL  
CONFERENCE  
ON METAL STRUCTURES**

**ICMS'2016  
ZIELONA GÓRA  
POLAND**

**CONFERENCE  
PROGRAMME**



Zielona Góra, 15-17 June, 2016

Conference programme ICMS' 2016

Time	Tuesday 14.06.2016	Wednesday 15.06.2016		Thursday 16.06.2016		Friday 17.06.2016	
	A2/A10 Buildings	Room H044 A10 Building	Room 102 A2 Building	Room H044 A10 Building	Room 102 A2 Building	Room H044 A10 Building	Room 102 A2 Building
08:00		REGISTRATION					
09:00		OPENING CEREMONY (Room H044, A10 Building)		KEYNOTE LECTURE (K3) (Room H044, A10 Building)		KEYNOTE LECTURE (K5) (Room H044, A10 Building)	
09:30		KEYNOTE LECTURE (K1) (Room H044, A10 Building)		COFFEE BREAK		COFFEE BREAK	
10:00							
10:15		COFFEE BREAK		SESSION S5		SESSION S6	
10:30							
10:45		SESSION S1		SESSION S9		SESSION S10	
11:00							
11:15		SESSION S2		G. BEUCHELT - EXHIBITION (Room H044, A10 Building)		CLOSING CEREMONY (Room H044, A10 Building)	
11:30							
11:45				PRESENTATIONS OF SPONSORS (Room H044)		LUNCH AND FAREWELL TOAST	
12:00							
12:15		LUNCH		LUNCH			
12:30							
12:45		KEYNOTE LECTURE (K2) (Room H044, A10 Building)		KEYNOTE LECTURE (K4) (Room H044, A10 Building)			
13:00							
13:15		SESSION S3		SESSION S7			
13:30							
13:45		SESSION S4		SESSION S8			
14:00							
14:15		COFFEE BREAK		SESSION S7 cont.		SESSION S8 cont.	
14:30							
14:45		TECHNICAL TRIP 16:45 (Meeting point: Palm House Parking)					
15:00							
15:15		SESSION S3		SESSION S7 cont.		SESSION S8 cont.	
15:30							
15:45		SESSION S4					
16:00							
16:15		COFFEE BREAK		SESSION S7 cont.		SESSION S8 cont.	
16:30							
16:45		TECHNICAL TRIP 16:45 (Meeting point: Palm House Parking)					
17:00							
17:15		SESSION S3		SESSION S7 cont.		SESSION S8 cont.	
17:30							
18:00		SESSION S4					
18:30							
19:00	GET-TOGETHER SUPPER + REGISTRATION	SUPPER IN ETHNOGRAPHIC MUSEUM in OCHLA		BANQUET IN THE PALM HOUSE			
19:30							
20:00		SUPPER IN ETHNOGRAPHIC MUSEUM in OCHLA		BANQUET IN THE PALM HOUSE			
21:00							
22:00		SUPPER IN ETHNOGRAPHIC MUSEUM in OCHLA		BANQUET IN THE PALM HOUSE			



## Organisation and Committees

Organized by

Polish Academy of Sciences, Committee for Civil Engineering, Section of Metal Structures

University of Zielona Góra, Faculty of Civil Engineering, Architecture and Environmental Engineering, Institute of Civil Engineering

President of Committee for Civil Engineering of Polish Academy of Sciences

## Conference is organized under auspices of



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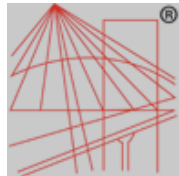


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## **General Information**

### **Reception and Conference Rooms Location**

Conference Registration Desk  
will be located at ground floor of A-2 Building, Szafrana 2 street.

The conference secretariat will be open:  
on Tuesday 14.06, from 18.00 to 21.00  
on Wednesday 15.06, from 8.15 to 16.00  
on Thursday 16.06, from 8.45 to 16.00  
on Friday 17.06, from 8.45 to 13.30

### **Conference rooms**

Room H044 (Aula), A10 Building, Szafrana 4 street.  
At this room opening and closing ceremonies will be held.  
All general lectures will be presented at this room and sessions S1, S3, S5, S7 and S9  
will be held at this room as well.

Room 102, A2 Building, Szafrana 2 street.  
At this room sessions S2, S4, S6, S8 and S10 will be held.

### **Lunches and coffee breaks**

will be served in the hall of A10 Building beside the H044 room.

### **Internet access**

Free wireless Internet access is available in all buildings of University of Zielona Góra.  
The username and the password are not required.

## **Presentations**

The time for General Lecture is 45 minutes plus 15 minutes predicted for a discussion.

Time for regular oral presentations is 10 minutes plus 5 for a discussion.

Participants are asked to send their presentations earlier as an attachment to the E-mail, if possible. Presentations can be uploaded and checked during the registration as well and during breaks in conference rooms.

## **Exhibition**

The exhibition presenting the history of a famous steel company of Georg Beuchelt acting in Zielona Góra (Grünberg, Niederschlesien) will be presented during the conference. Also archival bridge projects will be shown to conference participants.

## **Social events**

### **Get-together party**

All participants who will arrive on Tuesday afternoon are invited to get-together party which will take place in the hall of A10 Building beside the H044 room. The party starts at 18.00 and will continue till 21.30.

## **Technical trip**

(Tourist clothes is recommended)

Participants will take part in a technical trip on Wednesday afternoon. We will start at 16.45 at parking area near the Palm House. The old steel bridge on the Oder river in Cigacice will be visited. The bridge was manufactured in the Buechelt's company nearly hundred years ago. We will see also the other steel-concrete composite bridge and the new one under erection.

## **Supper in the Ethnographic Museum in Ochla**

The supper will start after the technical trip about 19.00. Regional meals will be served and a folk orchestra will play. There will be occasion to see folk art objects during the creation by craftsmen.

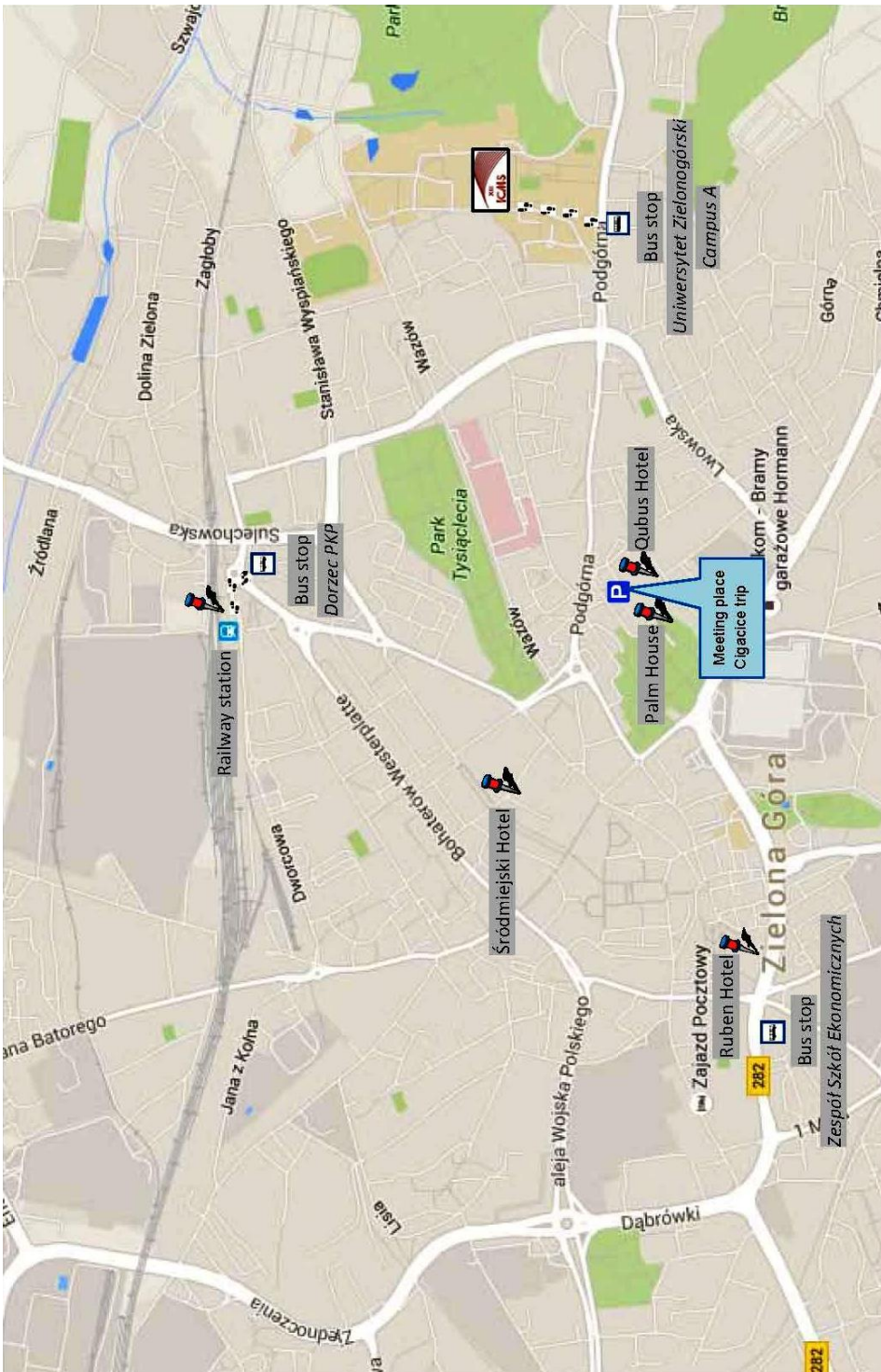
## **Concert and Banquet in the Palm House**

(Formal evening dress is recommended)

This particular evening will begin on Thursday at 19.00 in the Palm House with the 45 minutes concert of a well known performer Krzysztof Kiliański.

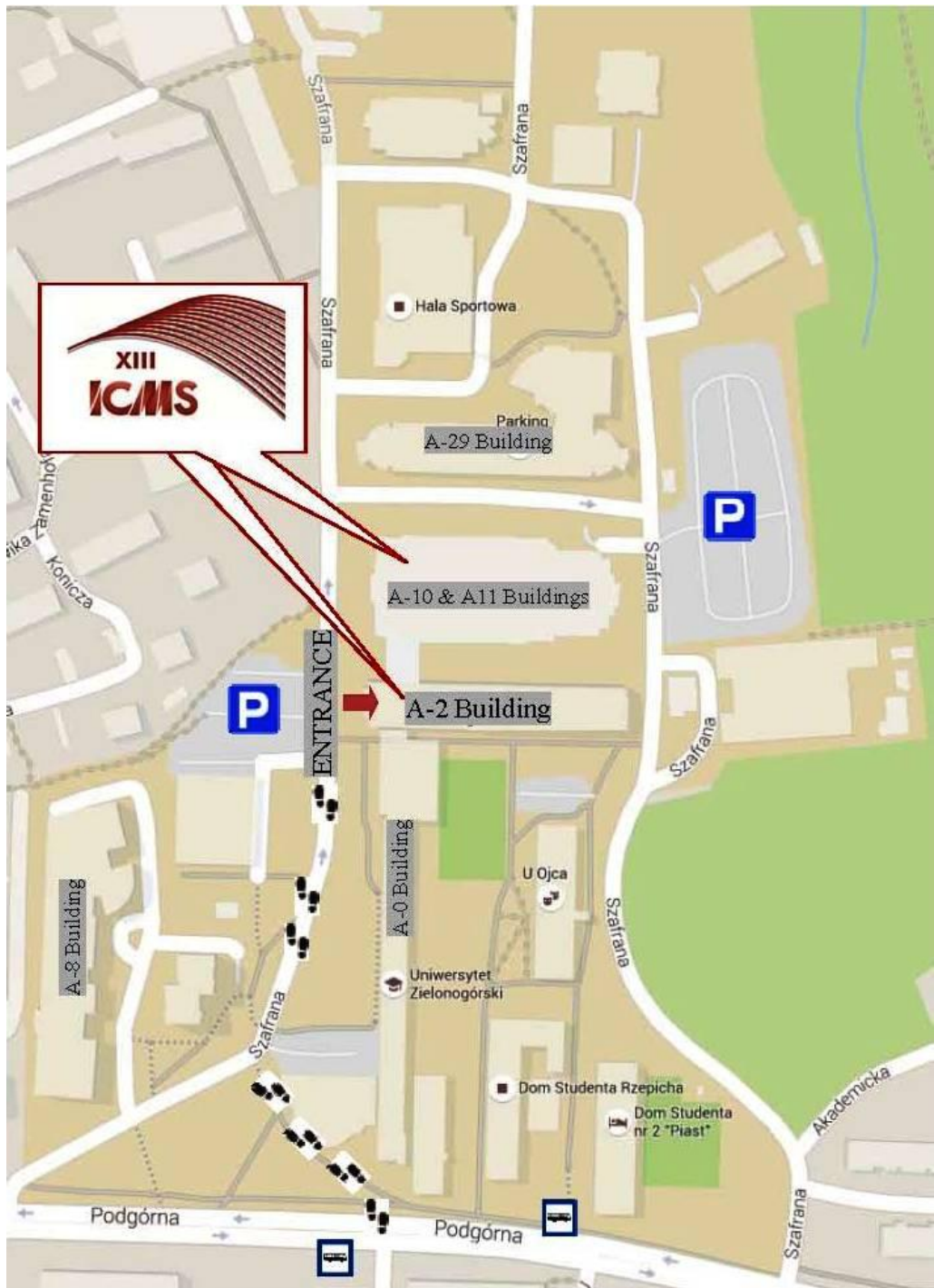


### Map of Zielona Góra



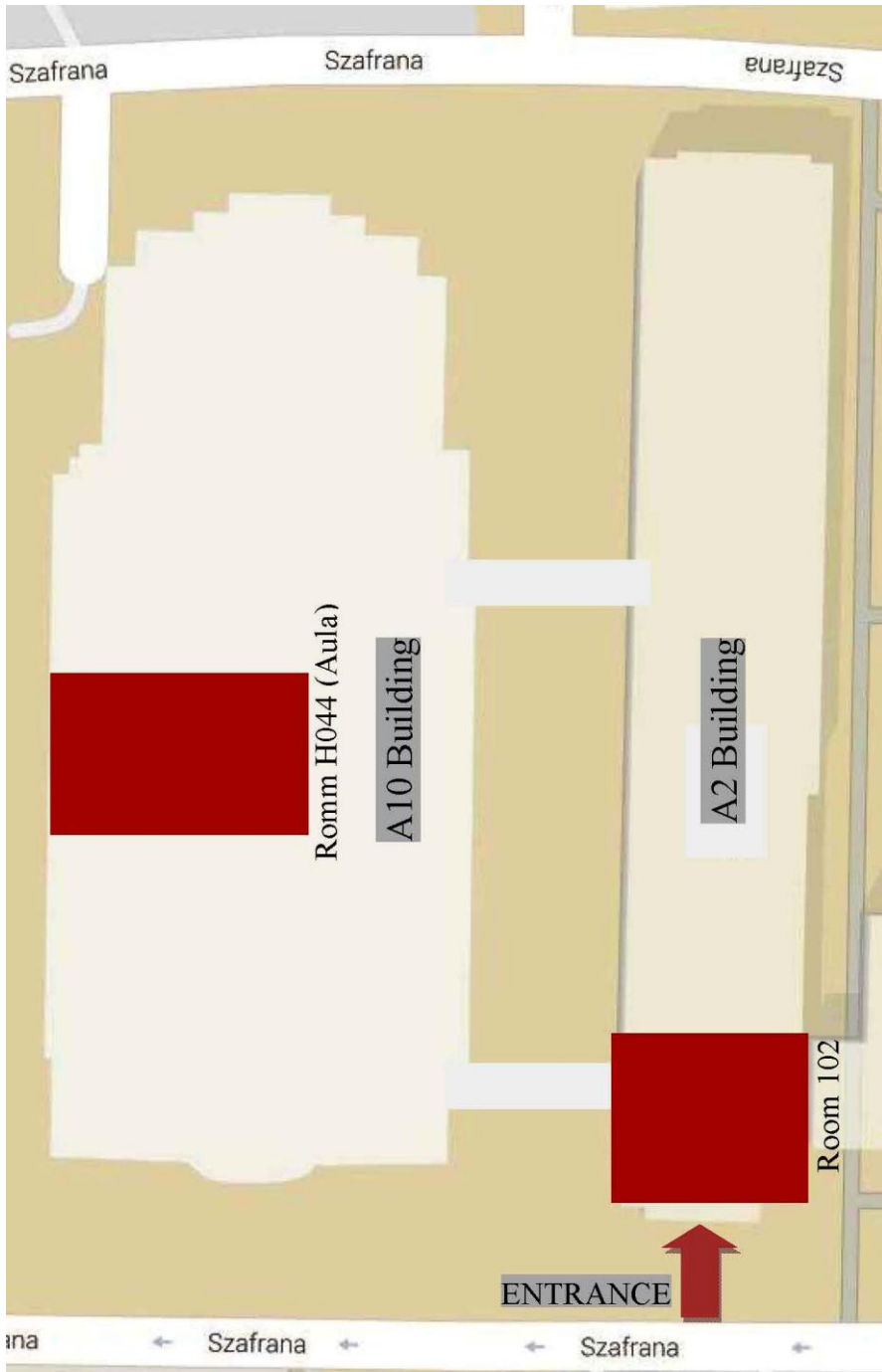
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Map of Campus A – University of Zielona Góra



Source: Google Maps

University of Zielona Góra – A2 & A10 Buildings



Source: Google Maps

**Tuesday 14.06.2016**

6 p.m. till 9 p.m. Get-together supper and registration of participants - Building A2/A10

**Wednesday 15.06.2016**

8.00 a.m. Registration of participants - Building A2

9.00-9.30 Opening ceremony - Room H044, Building A10

**Keynote lecture K1**

Room H044 (Aula), A10 Building

Chair: J. Marcinowski

9.30-10.30 *J. M. Rotter*  
Advances in understanding shell buckling phenomena and their characterisation for practical design

10.30-10.45 Coffee break

**10.45-12.15 - Sessions S1//S2**

**Session 1**

**Cold-formed sections and profiled sheeting**

Room H044 (Aula), A10 Building

Chair: A. Biegus & J. Żmuda

10.45-11.00 *M. Gajdzicki & W. Perlinski*  
Shear strength of trapezoidal and sinusoidal corrugated steel webs

11.00-11.15 *L. C. Prola, T. F. R. Lopes, J. R. Baptista & P. A. L. Fernandes*  
Curved cold formed steel roofing: numerical and experimental analysis

11.15-11.30 *K. Mitsui, A. Sato, H. Okada & T. Ono*  
Flexural elastic buckling stress of light gauge built-up member

- 11.30-11.45 *M. Gryniewicz & J.K. Szlendak*  
FEM model of the steel building roof includes stressed skin diaphragm action effects
- 11.45-12.00 *R. Studziński & K. Ciesielczyk*  
Experimental investigation of the stabilization of the C-section purlins by sandwich panels
- 12.00-12.15 *A. Łukowicz, P. Deniziak, W. Migda, M. Gordziej-Zagórowska & M. Szczepański*  
Innovative cold-formed GEB section under compression

**Session 2**  
**Steel-concrete composite structures**  
Room 102, A2 Building

Chair: *E. Szmigiera & W. Lorenc*

- 10.45-11.00 *E. Szmigiera, B. Grzeszykowski & M. Szadkowska*  
Concrete confinement estimation in composite steel-concrete columns
- 11.00-11.15 *D. Partov & V. Kantchev*  
AAEM method against Volterra integral analysis of composite beam
- 11.15-11.30 *Ł. Polus & M. Szumigala*  
Tests of shear connectors used in aluminium-concrete composite structures
- 11.30-11.45 *P. Kozioł, M. Kożuch, W. Lorenc & S. Rowiński*  
Innovative solution of transition zone in steel-concrete hybrid beam
- 11.45-12.00 *J. Chen, W.L. Jin & W. Xue*  
Composite structural electronic transmission tower
- 12.00-12.15 *G. Bertagnoli, D. Gino & E. Martinelli*  
Prestressing of simply supported composite bridges: a cost-benefit analysis

12.30-13.30 Lunch



**Keynote lecture K2**  
Room H044 (Aula), A10 Building

Chair: L. Ślęczka

- 13.30-14.30 *J. Qian, Z. Zhou & X. Wu*  
Advances in seismic assessment of steel-concrete composite high-rise buildings and engineering practices

**14.45-16.15 - Sessions S3//S4**

**Session 3**  
**Buckling and effect of bracings**  
Room H044 (Aula), A10 Building

Chair: A. Wysokowski & P. Alawdin

- 14.45-15.00 *J. Szafran & K. Rykaluk*  
Diagonal bracing members of lattice towers – analytical versus experimental studies
- 15.00-15.15 *M. A. Gizejowski, R. B. Szczerba & M. D. Gajewski*  
A unified resistance verification of beam-columns not susceptible to LT-buckling
- 15.15-15.30 *J. Kuś*  
Lateral-torsional buckling of steel beams with simultaneously tapered flanges and web
- 15.30-15.45 *A. Biegus & D. Czepiżak*  
Global geometrical imperfections for refined analysis of lateral roof bracing systems
- 15.45-16.00 *M.A. Gizejowski, Z. Stachura, M.D. Gajewski & R. B. Szczerba*  
A new method of buckling resistance evaluation of laterally restrained beam-columns
- 16.00-16.15 *R. Studziński & M. Czaja*  
Distortional lateral torsional buckling of open and closed steel cross-sections

**Session 4**  
**Dynamics, fatigue and seismic analyses**  
Room 102, A2 Building

Chair: *J. Qian & R. Jankowski*

- 14.45-15.00 *N. Lasowicz & R. Jankowski*  
Experimental and numerical study on polymer element used for reduction of temporary steel grandstand vibrations
- 15.00-15.15 *A. Sato & K. Mitsui*  
The effect of steel properties on deformation capacity of HSS columns
- 15.15-15.30 *P. Alawdin & G.V. Bulanov*  
Shakedown seismic analysis of composite steel-concrete frames systems
- 15.30-15.45 *A. M. Şenilă, A. Şigăuan & I. Petran*  
Comparison between behavior of steel and composite eccentrically braced frames with long links
- 15.45-16.00 *S. Shimizu*  
Collapse behaviour of steel box columns under seismic effect of the combined earthquakes
- 16.00-16.15 *K. Pawłowski, R. Świerzko & A. Włóka*  
Determination reserve of bearing capacity for steel, with influence of long-term fatigue load, used in structures in case of a fire
- 16.45-20.00 Technical trip
- 20.00-22.00 Supper in the ethnographic museum

**Thursday 16.06.2016**

**Keynote lecture K3**  
Room H044 (Aula), A10 Building

Chair: *M. Gizejowski*

9.00-10.00 *J. V. Retief*  
Harmonization of structural standards on the reliability basis of design

10.00-10.15 Coffee break

**10.15-11.45 - Sessions S5//S6**

**Session 5**  
**Bridges**  
Room H044 (Aula), A10 Building

Chair: *T. Siwowski & W. Radomski*

10.15-10.30 *V. Krivy, V. Urban & K. Kreislova*  
Atmospheric corrosion tests on weathering steel bridges in the Czech Republic

10.30-10.45 *D. Partov, R. Ivanov & D. Dinev*  
The history of the first orthotropic bridge in Bulgaria

10.45-11.00 *D. Beben*  
Finite element analysis of metal-soil bridge under static loads

11.00-11.15 *G. Bertagnoli, D. Gino & G. Mancini*  
Effect of endogenous deformations in composite bridges

11.15-11.30 *B. Wichtowski & J. Hołowaty*  
Quality of butt welds in bridges and fatigue classes according to European Codes and testing

11.30-11.45 *A. Wysokowski*  
Fatigue of structural elements in steel bridges – theory and practice

**Session 6**  
**Structural steel, metallurgy and behaviour in fire**  
Room 102, A2 Building

Chair: *J. Chen & M. Maślak*

- 10.15-10.30 *M. Maslak, M. Pazdanowski & M. Snela*  
Redistribution of internal forces generated in a steel frame structure with flexible joints when exposed to a fire
- 10.30-10.45 *M. Maslak, M. Pazdanowski & A. Tkaczyk*  
Fire resistance evaluation of a steel sway frame load-bearing structure using the linear programming
- 10.45-11.00 *T. Lehnert & F. Schröter*  
Recent developments in heavy plate production for modern steel bridges
- 11.00-11.15 *J. Jiang, C. K. Lee & S. P. Chiew*  
Modelling for the effect of welding process on buckling of built-up high strength steel box column
- 11.15-11.30 *A. Łukowicz & D. Kowalski*  
Application of Barkhausen method to determine internal stresses in cold-rolled and hot-rolled sheets
- 11.30-11.45 *D. Kowalski*  
Application of Barkhausen effect in the impact assessment of welding to internal stress distribution in steel

- 12.00-12.15 G. Beuchelt – Exhibition - Room H044 (Aula), A10 Building
- 12.15-12.30 Presentations of sponsors - Room H044 (Aula), A10 Building
- 13.00-14.00 Lunch

**Keynote lecture K4**  
Room H044 (Aula), A10 Building

Chair: *S. Shimizu*

- 14.00-15.00 *T. W. Siwowski & K. Żółtowski*  
Recent steel structures in Poland – the selected projects

**15.00-16.00 - Sessions S7//S8**

**Session 7**  
**Strength, stability and postbuckling behaviour**  
Room H044 (Aula), A10 Building

Chair: Z. Kowal & D. Bęben

- 15.00-15.15 *P. Lorkowski & B. Gosowski*  
Experimental investigations on non-uniform torsion of the two-chord members laced at a single plane
- 15.15-15.30 *J. Szafran, K. Juszczyk & M. Kamiński*  
Computer FVM-FEM analysis of the large span grid shell roof
- 15.30-15.45 *M. A. Gizejowski & Z. Stachura*  
Buckling strength of a steel multi-storey framework according to Eurocode's general method
- 15.45-16.00 *P. Alawdin & L. Liepa*  
Shakedown optimization of the thin-wall metal structures under strength and stiffness constraints

16.00-16.15 Coffee break

**16.15-17.15 - Sessions S7//S8 cont.**

**Session 7 cont.**  
**Strength, stability and postbuckling behaviour**  
Room H044 (Aula), A10 Building

Chair: Z. Kowal & D. Bęben

- 16.15-16.30 *P. Błażejowski & J. Marcinowski*  
Buckling capacity curves for pressurized spherical shells
- 16.30-16.45 *H. Coelho, A. Torres, C. Moreira, R. Silva, J.M. Soares, D. Pinto & P. Pacheco*  
An integrated approach for fatigue prevention in Movable Scaffolding System
- 16.45-17.00 *M. Krajewski & P. Iwicki*  
Stability of a truss under upward wind loading



- 17.00-17.15 *M. Gordziej-Zagórska, E. Urbańska-Galewska, Ł. Pyrzowski, P. Deniziak & A. Łukowicz*  
Preliminary experimental research on stability of truss' joint with positive eccentricity

**Session 8**  
**Joints and connections**  
Room 102, A2 Building

Chair: *J. Retief & E. Urbańska-Galewska*

- 15.00-15.15 *M. Górski & A. Kozłowski*  
Durability assessment of connections between sandwich panels and purlins
- 15.15-15.30 *P. Kawecki, J. Łaguna & A. Kozłowski*  
FEM analysis of the extended end-plate splice of welded I-girders with multiple bolt rows and bolts per row
- 15.30-15.45 *P. Krystosik*  
Equivalent model of semi-rigid supporting node in the calculations of steel frames
- 15.45-16.00 *L. Ślęczka*  
Component-based modelling of beam-to-column joints subjected to variable actions

16.00-16.15 Coffee break

**16.15-17.15 - Sessions S7//S8 cont.**

**Session 8 cont.**  
**Joints and connections**  
Room 102, A2 Building

Chair: *J. Retief & E. Urbańska-Galewska*

- 16.15-16.30 *A. Floricel, S. Benzar, V. Ungureanu & G. Zagari*  
Steel column-base solutions for over-roofing of existing buildings. A numerical study
- 16.30-16.45 *A. Silveira, W. Barbosa, P. Vellasco, A. Silva & L. Lima*  
Numerical analysis of stainless steel bolted lap joints
- 16.45-17.00 *A. Kozłowski & K. Ostrowski*

17.00-17.15 FEM based assessment of the rotation capacity of bolted joints  
*J. Bródka & M. Broniewicz*  
Truss design with one-membered elements and N-joints

19.00-22.00 Banquet in the Palm House

**Friday 17.06.2016**

**Keynote lecture K5**  
Room H044 (Aula), A10 Building

Chair: *A. Kozłowski*

9.00-10.00 *M. Veljkovic, C. Rebelo & M. Pavlovic*  
Land-based supporting structures for wind converters

10.00-10.15 Coffee break

**10.15-11.30 - Sessions S9//S10**

**Session 9**  
**Silos, tanks and vessels**  
Room H044 (Aula), A10 Building

Chair: *M. Rotter & E. Hotała*

10.15-10.30 *E. Hotała, Ł. Skotny, M. Kuśnierek & J. Boniecka*  
Experimental investigations on the resistance of vertical stiffeners of steel silos shells made of corrugated sheets

10.30-10.45 *Ł. Skotny, E. Hotała & J. Boniecka*  
Load-bearing capacity of discretely supported steel silos shells with skirts

10.45-11.00 *N. Stranghöner & S. Stehr*  
Postbucklingbehaviour of open thin-walled shells made of stainless steel

- 11.00-11.15 *K. Rejowski & P. Iwicki*  
Simplified stability analysis of steel cylindrical silos with corrugated walls and vertical columns
- 11.15-11.30 *J. Dudkiewicz & R. Ignatowicz*  
Problems of designing tubular shell galleries

**Session 10**  
**Reliability, masts and towers**  
Room 102, A2 Building

Chair: *M. Veljkovic & J. Szlendak*

- 10.15-10.30 *J. Kaliszuk, J. Marcinowski & Z. Waszczyszyn*  
Searching for significant basic variables of experimentally tested steel, cylindrical shells
- 10.30-10.45 *S. Pichugin, O. Zyma & P. Vynnykov*  
Reliability level of the buried main pipelines linear part
- 10.45-11.00 *Z. Kowal*  
Influence of bearing capacity and reliability of connections and nodes on bearing capacity and reliability of complex bar structures
- 11.00-11.15 *M. Just*  
Deformation of steel lattice towers for overhead lines – Case study
- 11.15-11.30 *M. Matuszkiewicz*  
Influence of the initial guy forces on the static computations of mast taking into account the mast shaft buckling form

- 11.45-12.15 Closing ceremony – Room H044 (Aula), A10 Building
- 12.30-13.30 Lunch and farewell toast