



**THE INTERNATIONAL  
COLLOQUIUM ON  
STABILITY AND DUCTILITY  
OF STEEL STRUCTURES**

**PROGRAMME BOOK**

**11-13 September 2019,  
Prague, Czech Republic**

## Table of Contents

Organizers & Partners .....	2
Exhibitors .....	2
Welcome Note.....	3
Conference Venue .....	4
Scientific Programme .....	5
Tomáš Vraný SDSS Award.....	6
Social Programme.....	8
General Information .....	10
Programme .....	12

## Organizers & Partners



**Auletris**  
event management services



**FACULTY OF CIVIL  
ENGINEERING  
CTU IN PRAGUE**

## Exhibitors

**IDEA StatiCa®**

*Calculate yesterday's estimates*

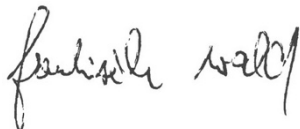
## Welcome Note

The series of International Colloquia on Stability and Ductility of Steel Structures have been supported by the Structural Stability Research Council (SSRC) for more than forty years and its objective is to present the progress in theoretical, numerical and experimental research in the field of stability and ductility of steel and steel-concrete composite structures. Special emphasis is laid on new concepts and procedures concerning the analysis and design of steel structures and on the background, development and application of rules and recommendations either appearing in recently published Codes or Specifications or about to be included in their upcoming versions. This International Colloquium series started in 1972 in Paris and its subsequent editions took place in different cities with the last five being held in: Timisoara, Romania (1999), Budapest, Hungary (2002), Lisbon, Portugal (2006), Rio de Janeiro, Brazil (2010) and Timisoara, Romania (2016).

The 2019 edition of SDSS is organized by the Czech Technical University in Prague.

It is our pleasure to welcome you in Prague for the SDSS 2019. We wish you to spend inspiring days in Prague with presentations on various topics with friends and your fellow colleagues.

**František Wald, Chairman & Michal Jandera, Scientific Secretary**



## Conference Venue

### Faculty of Civil Engineering, CTU in Prague

#### Address

Thákurova 7/2077, 166 29 Prague 6 Dejvice

Nearby the faculty there is a metro station Dejvická, tram station Thákurova and Vítězné náměstí, bus station Studentský dům and Národní technická knihovna.

#### The Faculty

The Faculty of Civil Engineering of the Czech Technical University in Prague is one of the largest schools providing civil engineering university education world-wide.

The Faculty of Civil Engineering (FCE) is one of the largest colleges of the Czech Technical University. The academic community comprises approximately 3 500 students and 600 teaching and research staff.

#### Venue Organization

The registration desk, posters desks, coffee breaks and lunches will take place in the atrium of the main building C.

The lecture rooms are located on the first floor of the building C, plenary sessions and keynote lectures will take place on the first floor of the building B.

## Scientific Programme

In the **Technical sessions**, 15 minutes is reserved for each speaker – 12 minutes is for the talk and 3 minutes for discussion.

The **Poster session** is scheduled on Thursday 12 September from 13:30 to 14:00, starting already during the lunch time and from 15:30 to 16:00 during the afternoon coffee break. All the posters are to be properly displayed on Thursday morning and respective authors are asked to be present at their posters during the whole period of the poster session.

There will be 2 **Keynote lectures** and 1 **Plenary session** during the conference. The first Keynote lecture, scheduled after the Opening session, is dedicated to *Structural steel design by advanced analysis with strain limits* that will be presented by **Leroy Gardner** from Imperial College of London, United Kingdom. It will be followed by another lecture on *Advancements in the stability design of steel frames considering general nonprismatic members and general bracing conditions* presented by **Donald White** from Georgia Institute of Technology, USA.

The second Keynote lecture will take place in the Thursday morning with three presenters. **Ronald Ziemian** from Bucknell University, Pennsylvania, USA with *Design by Advanced Analysis – 2016 AISC Specification*, **Luís Simões da Silva** from ISE, Department of Civil Engineering, University of Coimbra, Portugal with *Stability design of steel structures: From members to plates and shells* and **Ben Young** from The Hong Kong Polytechnic University, Hong Kong (China) with *Cold-formed high strength steel RHS under combined bending and web crippling*.

The Plenary session will be in the morning on the last day of the conference, 13 September. You will have the opportunity to hear **Sandor Adany, Thomas Misiak, Jurgen Becque, Kim Rasmussen** and **Esther Real**.

## Tomáš Vraný SDSS Award

The conference organising committee together with the Steel Construction journal (Ernst & Sohn) honor the best colloquium paper with the Tomáš Vraný SDSS Award and publish it also in the journal. The award commemorates Czech Technical University Prague expert on stability of steel structures Tomáš Vraný (1965 – 2010).

### Tomáš Vraný (1965 – 2010)



Tomáš Vraný graduated at the Czech Technical University in Prague in 1988. After his graduation, he became a research student with the thesis "Behaviour of trapezoidal sheeting connected to non-structural floorboards" under supervision of Professor Jiří Studnička. In 1992, he became an assistant professor at the university. In 2002 he finished his research in "Rotational restraint of thin-walled Z-purlins" and became an associate professor. His findings were included in Eurocode 3 -1-3. He has translated several Eurocodes into Czech and was

a National Technical Contact for Eurocode 3 - 6: Crane supporting structures. In ECCS TC7 "Cold-formed thin-walled sheet steel in buildings" he was very active in the sub committee "Practical Improvement of Design Procedures". His contributions were always very well developed and his kind and friendly manner was positive to all discussions. Tomáš Vraný was one of the key persons at the Department of steel and timber structures at CTU Prague and a favoured lecturer among students. He was a fair-minded, hard-working and modest person, an expert, always ready to help, and mainly and excellent friend.

**Steel Construction**



## Social Programme

### Welcome Reception

**11/9 2019, 19:00 – National Technical Museum**

The first day will be concluded by a Welcome Reception taking place in the National Technical Museum (address: Kostelní 42, 170 78 Prague 7) from 19:00 on Wednesday 11 September. Come to meet your friends and colleagues to wrap up the first day with a drink and some tasty treats of local cuisine. You are also welcome to explore some of the exhibition in the Technical Museum. Section of architecture and other parts will be open for the attendants of the Welcome Reception.

### Conference Banquet

**12/9 2019, 19:00 – Malostranský Palace**

The Conference Banquet will take place on 12 September in the Malostranský Palace (address: Malostranské náměstí 25, 110 00 Prague 1).

Enjoy the special atmosphere of the late baroque building in the heart of the city.

Malostranský Palace is located near the tram station Malostranské náměstí. The Dinner is open to all participants.

### Optional Trip to Kutná Hora

**14/9 2019, 08:30 – Meeting point: Faculty of Civil Engineering**

**95 EUR per person**

This gem of Bohemian history lies just an hour outside of Prague and is home to much more than pyramids of skulls and bones. The city center has been a UNESCO World Heritage Site since 1995. Enjoy the trip back in time in the town that once became a wealthy enclave and competed with Prague in the Middle Ages for political and economic power.

This 1-day trip is scheduled on Saturday 14 September with the departure at 8:30.

Price includes lunch in the traditional Czech restaurant, entrance to the Cathedral of St. Barbara and to the Ossuary.

For the sightseeing tour you can register via ConfTool system or at the registration desk during the conference.



## General Information

### Registration & Information desk

The registration and information desk will be open daily from 8:00 (on Wednesday from 7:30). In case of any questions, contact us on +420607786670.

### Prague Public Transport

All pre-registered participants will receive public transport ticket valid throughout the conference for all sorts of public transport.

Prague provides three metro lines – A, B, C. Line A is the most convenient one for travelling from and to the conference venue.

The night public transport in Prague is one of the best in the world. All night tram lines are reachable at one central transfer station. Buses and trams have their night lines between 12 pm and 4 am.

Always buy your public transport ticket at the station and do not forget to validate it on the bus or tram.

For more information about the Prague public transport, please have a look at <http://www.dpp.cz/en/>.

### Tourist Information

Prague.eu – The Official Tourist Website for Prague.

Honest Guide – YouTube channel with tips&tricks for your stay in Prague.

### Wi-fi

Free wi-fi – SSID: SDSS2019, Password: konfsdss

If you use Eduroam, you can connect to the Eduroam network with the username and password of your home institution.

### ATM and Currency

ATM is located out of the building of Faculty of Civil Engineering.

Currency of the Czech Republic is the Czech Crown (CZK). However, Euro is accepted in many restaurants, hotels and shops. Payment with credit card is always a solution. Exchange rates are approximately 26 CZK/EUR and 24 CZK/USD.

### Emergency Calls

General Emergency: 112, Fire Department: 150, Medical Services: 155, Police: 158.

## Programme

Wednesday 11/9			
07:30 - 08:30	<b>Registration</b> Location: Atrium		
08:30 - 09:00	<b>Opening Session</b> Location: B286		
09:00 - 10:00	<b>K1: Keynote Lectures</b> Location: B286		
10:00 - 10:30	<b>Coffee Break</b> Location: Atrium		
10:30 - 12:15	<b>Composite: Steel and concrete composite structures, material</b> Location: C204	<b>Connections 1: Connections</b> Location: C206	<b>Members 1: Columns</b> Location: C202
12:15 - 13:45	<b>Lunch</b> Location: Atrium		
13:45 - 15:30	<b>CFS1: Cold formed steel</b> Location: C204	<b>Connections 2: Connections</b> Location: C206	<b>Members 2: Beams</b> Location: C202
15:30 - 16:00	<b>Coffee Break</b> Location: Atrium		
16:00 - 17:30	<b>CFS2: Cold formed steel, sandwich panels</b> Location: C204	<b>Connections 3: Connections, welds</b> Location: C206	<b>Members 3: Beams, beam-columns</b> Location: C202
19:00 - 21:00	<b>Welcome Reception</b> National Technical Museum		



08:30-09:00 • B286

### Opening session

Session Chair: František Wald, Czech Technical University in Prague

Session Chair: Michal Jandera, Czech Technical University in Prague

---

**8:30 am - 9:00 am**

Welcome and introduction



09:00-10:00 • B286

### K1: Keynote lectures

Session Chair: Todd Helwig, University of Texas at Austin

Session Chair: Dinar Camotim, Instituto Superior Técnico, University of Lisbon

---

**9:00 am - 9:30 am**

Structural steel design by advanced analysis with strain limits

Gardner, Leroy

*Imperial College London, United Kingdom*

**9:30 am - 10:00 am**

Advancements in the stability design of steel frames considering  
general nonprismatic members and general bracing conditions

White, Donald W.

*Georgia Institute of Technology, United States of America*



10:30-12:15 • C204

## Composite: Steel and concrete composite structures, material

Session Chair: Ben Young, The Hong Kong Polytechnic University

Session Chair: Jakub Dolejš, CTU in Prague

---

**10:30 am - 10:45 am**

Ductility of Different Types of Shear Connectors - Experimental and Numerical Analysis

Spremić, Milan

*University of Belgrade Faculty of Civil Engineering, Serbia*

**10:45 am - 11:00 am**

Experimental study on the shear connections of composite girders with trapezoidally corrugated web

Németh, Gábor

*BME Department of Structural Engineering, Hungary*

**11:00 am - 11:15 am**

Slim-floor beam bending moment resistance considering partial shear connection

Zhang, Qingjie

*University of Luxembourg, Luxembourg*

**11:15 am - 11:30 am**

Composite floor system with cold-formed trussed beams and prefabricated concrete slab

Batista, Eduardo de Miranda

*Federal University of Rio de Janeiro, Brazil*

**11:30 am - 11:45 am**

Behaviour of a concrete slab in compression in composite steel-concrete frame joints

Červenka, Petr

*Czech Technical University in Prague, Czech Republic*

**11:45 am - 12:00 pm**

A reexamination of high strength steel Q690 plasticity model

Wang, Yuanzuo

*Tongji University, People's Republic of China*

**12:00 pm - 12:15 pm**

**Calibration of parameters of combined hardening model using tensile tests**

Zub, Ciprian Ionut

*Politehnica University of Timisoara*

**11/9**

**10:30-12:15 • C206**

## **Connections 1: Connections**

Session Chair: Jean-Pierre Jaspart, Liège University

Session Chair: Martina Eliášová, Faculty of Civil Engineering, CTU in Prague

---

**10:30 am - 10:45 am**

**Numerical Study of End-Plate Steel Connections with Two and Four Bolts-per-Row**

Nunes, Daniel Luís

*University Politehnica of Timisoara, Romania*

**10:45 am - 11:00 am**

**Experimental Study of Beam-to-Column Connection with Bolted Joints**

Koyama, Yohei

*Nagoya Institute of Technology, Japan*

**11:00 am - 11:15 am**

**Comparison of two different Innovative Solutions for IPE Beam to CHS Column Connections**

Das, Rajarshi

*Construction Engineering Research Group, Universiteit Hasselt, Belgium*

**11:15 am - 11:30 am**

**Modelling of one-sided unstiffened beam-to-column joint**

Gremza, Grzegorz

*Silesian University of Technology, Poland*

**11:30 am - 11:45 am**

**Experimental tests on bolted end-plate connections using thermal insulation layer attached to steel structures**

Couchaux, Maël

*INSA Rennes, France*

**11:45 am - 12:00 pm**

**Influence of geometrical imperfection of rib stiffeners on beam-to-column joint behaviour**

Tartaglia, Roberto

*University of Naples Federico II, Italy*

**12:00 pm - 12:15 pm**

**Behavior of extended end-plate connections under cyclic alternate loading**

Tomăscu, Ioana Cristina

*Technical University of Cluj-Napoca, Civil Engineering Faculty, Romania*



**10:30-12:15 • C202**

### **Members 1: Columns**

Session Chair: Luís Simões da Silva, University of Coimbra

Session Chair: Mark Andrew Bradford, UNSW Sydney

---

**10:30 am - 10:45 am**

**Buckling behavior and strength of corroded steel shapes under axial compression**

Kanno, Ryoichi

*Nippon Steel Corporation, Japan; Kanazawa University, Japan*

**10:45 am - 11:00 am**

**Explanatory notes to buckling design of longitudinally welded aluminium compression members**

Misiek, Thomas

*Breinlinger Ingenieure, Germany*

**11:00 am - 11:15 am**

**Experimental Calibration of Centrally Loaded Built-up Battened Compression Members**

El-Mahdy, Ghada

*The British University in Egypt (BUE), Egypt*

**11:15 am - 11:30 am**

**Simulation based imperfections and their effects on stability resistance**

Vigh, László Gergely

*Budapest University of Technology and Economics, Hungary*

**11:30 am - 11:45 am**

**Experimental Investigation of Compressed Stainless Steel Angle Columns**

Filipović, Aljoša

*University of Belgrade Faculty of Civil Engineering, Serbia*

**11:45 am - 12:00 pm**

**Buckling of columns during welding**

Vild, Martin

*FAST VUT, Czech Republic*

**12:00 pm - 12:15 pm**

**Study on the Out-of-Plane Stability of Steel Portal Frames**

Rangelov, Nikolaj

*Department of Steel and Timber Structures, UACEG, Sofia, Bulgaria*

## **11/9**

**13:45-15:30 • C204**

### **CFS1: Cold formed steel**

Session Chair: Viorel Ungureanu, Politehnica University of Timisoara

Session Chair: Ivan Balázs, Brno University of Technology, Faculty of Civil Engineering

---

**1:45 pm - 2:00 pm**

**FEM analysis of the buckling behaviour of thin-walled CFS columns. Part I - Channel (C) and Double Channel (I) cross-sections**

Craveiro, Helder D.

*ISISE - Institute for Sustainability and Innovation in Structural Engineering, University of Coimbra Portugal*

**2:00 pm - 2:15 pm**

**FEM analysis of the buckling behaviour of thin-walled CFS columns. Part II - Monosymmetric (R) and doubly symmetric built-up box cross-sections.**

Henriques, José

*CERG – Construction Engineering Research Group, Faculty of Engineering Technology, University Hasselt, Belgium*

**2:15 pm - 2:30 pm**

**On the Incorporation of Cross-Section Restraints in Generalised Beam Theory**

Basaglia, Cilmar

*Department of Structural Engineering, School of Civil Engineering, Architecture and Urban Design, University of Campinas, Brazil*

**2:30 pm - 2:45 pm**

**Local-distortional buckling interaction of cold-formed steel columns design approach**

Batista, Eduardo de Miranda

*Federal University of Rio de Janeiro, Brazil*

**2:45 pm - 3:00 pm**

**Direct Strength Method (DSM) design of end-bolted cold-formed steel columns failing in distortional modes**

Landesmann, Alexandre

*Civil Engineering Program, COPPE, Federal University of Rio de Janeiro, Brazil*

**3:00 pm - 3:15 pm**

**Experimental and numerical analysis of the local and interactive buckling behaviour of hollow sections**

Toffolon, Andrea

*Bundeswehr University Munich, Institute of Structural Engineering, Germany*

**3:15 pm - 3:30 pm**

**Progressive collapse assessment of storage racks due to localized failures. Explicit consideration of dynamic effects**

Marginean, Ioan

*Politehnica University Timisoara, Romania*





13:45-15:30 • C206

## Connections 2: Connections

Session Chair: Atsushi Sato, Nagoya Institute of Technology

Session Chair: Adrian Ciutina, Politehnica University of Timisoara

---

**1:45 pm - 2:00 pm**

**Tests of gusset plate connection under compression**

Vesecký, Jan

*Czech Technical University in Prague, Czech Republic*

**2:00 pm - 2:15 pm**

**Numerical modelling of gusset plate connections under eccentric compression**

Vesecký, Jan

*Czech Technical University in Prague, Czech Republic*

**2:15 pm - 2:30 pm**

**Design of gusset plate connection with single-sided splice member by component based finite element method**

Wald, František

*Czech Technical University in Prague, Czech Republic*

**2:30 pm - 2:45 pm**

**Design of slender compressed plates in structural steel joints by component based finite element method**

Wald, František

*Czech Technical University in Prague, Czech Republic*

**2:45 pm - 3:00 pm**

**Experimental investigation on the instability phenomenon in stainless steel connections – Plate Curling**

Tenchini, André

*Structural Engineering Department, UERJ – State University of Rio de Janeiro, Brazil*

**3:00 pm - 3:15 pm**

**Ductility assessment of structural steel and composite joints**

Jaspart, Jean-Pierre

*Liege University, Belgium*

**3:15 pm - 3:30 pm**

**Behaviour of column base plates under bi-axial bending moment**

Seco, Laura

*Institut National des Sciences Appliquées de Rennes, France*



**13:45-15:30 • C202**

## **Members 2: Beams**

Session Chair: Harald Unterweger, Graz University of Technology

Session Chair: Jurgen Becque, The University of Sheffield

---

**1:45 pm - 2:00 pm**

**Elastic Buckling Strength of H-shaped Beams Subjected to End Moment and Uniformly Distributed Load**

Shinohara, Daiki

*Tokyo Institute of Technology, Japan*

**2:00 pm - 2:15 pm**

**Local Buckling Strength of Vertical Haunch H-Shaped Beam Under Shear Bending**

Ishida, Wataru

*Tokyo Institute of Technology, Japan*

**2:15 pm - 2:30 pm**

**Buckling of web-tapered high strength steel beams**

Bradford, Mark Andrew

*UNSW Sydney, Australia*

**2:30 pm - 2:45 pm**

**Lateral torsional buckling of hybrid steel-glass beam**

Eliášová, Martina

*Faculty of Civil Engineering, CTU in Prague, Czech Republic*

**2:45 pm - 3:00 pm**

**Imperfection sensitivity of corrugated web girders subjected to lateral-torsional buckling**

Jáger, Bence

*Department of Structural Engineering, Faculty of Civil Engineering, Budapest University of Technology and Economics, Hungary;*

**3:00 pm - 3:15 pm**

**Lateral-torsional buckling of stainless steel beams with slender cross section**

Šorf, Marek

*Czech Technical University in Prague, Czech Republic*

**3:15 pm - 3:30 pm**

**Effect of Stiffener Position on Buckling Behavior of H-Shaped Steel Beam with Upper Flange Restraint**

Igawa, Naoki

*Tokyo Institute of Technology, Japan*



**16:00-17:30 • C204**

**CFS2: Cold formed steel, sandwich panels**

Session Chair: Thomas Misiak, Breinlinger Ingenieure

Session Chair: Nikolaj Rangelov, UACEG Sofia

---

**4:00 pm - 4:15 pm**

**Experimental investigation of flexural buckling of sandwich panels with steel facings**

Balázs, Ivan

*Brno University of Technology, Faculty of Civil Engineering, Czech Republic*

**4:15 pm - 4:30 pm**

**Experimental investigation of stability behaviour of members supported by sandwich panels at elevated temperature**

Lendvai, Anita

*Budapest University of Technology and Economics, Hungary*

**4:30 pm - 4:45 pm**

**Shear behaviour of sandwich panel fasteners in fire**

Arha, Tesfamariam

*Czech Technical University in Prague, Czech Republic*

**4:45 pm - 5:00 pm**

**Numerical modelling of a two storey LWS building braced with gypsum-based panels**

Shakeel, Sarmad

*University of Naples "Federico II", Italy*

**5:00 pm - 5:15 pm**

**Quantifying the seismic ductility of lightweight steel lateral force resisting systems through procedures of FEMA P695**

Shakeel, Sarmad

*University of Naples "Federico II", Italy*

**11/9**

**16:00-17:30 • C206**

### **Connections 3: Connections, welds**

Session Chair: Aurel Stratan, Politehnica University of Timisoara

Session Chair: Eduardo de Miranda Batista, Federal University of Rio de Janeiro

---

**4:00 pm - 4:15 pm**

**U-shaped steel plate dissipative connection for concentrically braced frames**

Henriques, José

*CERG – Construction Engineering Research Group, Faculty of Engineering Technology, University Hasselt, Belgium*

**4:15 pm - 4:30 pm**

**Warping transfer superelement model for bolted endplate connections subject to 3D loads**

Vaszilievits-Sömjén, Bálint

*KÉSZ Holding Zrt, Hungary*

**4:30 pm - 4:45 pm**

**Experimental study on SCFs of empty SHS-SHS T-joints subjected to static out-of-plane bending**

Matti, Feleb N.

*Western Sydney University, Australia*

**4:45 pm - 5:00 pm**

**Analysis of Mechanical Properties of Cold-Formed High Strength Steels at the Weld Area**

Werunský, Martin

*CTU in Prague, Czech Republic*

**5:00 pm - 5:15 pm**

**Welds on high-strength steels – Influence of the welding process and the number of layers**

Stroetmann, Richard

*Technical University of Dresden, Germany*

**5:15 pm - 5:30 pm**

**Stainless steel fillet weld tests**

Feber, Nina

*ČVUT, Czech Republic*



**16:00-17:30 • C202**

### **Members 3: Beams, beam-columns**

Session Chair: Ryoichi Kanno, Nippon Steel Corporation

Session Chair: Donald White, Georgia Tech

---

**4:00 pm - 4:15 pm**

**The use of inclinometers and DIC to measure the rotation in full-scale tests on construction elements**

Lauwens, Kathleen

*KU Leuven, Department of Civil Engineering, Belgium; Research Foundation Flanders, Belgium*

**4:15 pm - 4:30 pm**

**Stainless steel SHS and RHS beam-columns**

Židlický, Břetislav

*CTU in Prague, Czech Republic*

**4:30 pm - 4:45 pm**

**Experimental Study on Square Steel Tubular Columns under Compressive Force with Biaxial Bending Moment**

Onogi, Takeshi

*Nagoya Institute of Technology, Japan*

**4:45 pm - 5:00 pm**

**Design Limitations for the Steel Beam-Column to Ensure Full Plastic Moment**

Sato, Atsushi

*Nagoya Institute of Technology, Japan*

**5:00 pm - 5:15 pm**

**Study on the deformation and rotation capacity of HSS beams and beam-columns**

Müller, Andreas

*Bundeswehr University Munich, Germany*

**5:15 pm - 5:30 pm**

**The stability of semi-braced steel frames containing members with stepped segments**

Xu, Lei

*University of Waterloo, Canada*

Thursday 12/9			
08:30 - 10:00	<b>K2: Keynote Lectures</b> Location: B286		
10:00 - 10:30	<b>Coffee Break</b> Location: Atrium		
10:30 - 12:15	<b>Fire 1: Fire</b> Location: C204	<b>PI1: Plates</b> Location: C206	<b>TC8_1: Session of ECCS TC8 – 1</b> Location: C202
12:15 - 13:45	<b>Lunch</b> Location: Atrium		
13:30 - 14:00	<b>Poster Session</b> Location: Atrium		
14:00 - 15:30	<b>Fire 2: Fire</b> Location: C204	<b>PI2: Plates: shear, patch loading; Shells</b> Location: C206	<b>TC8_2: Session of ECCS TC8 – 2</b> Location: C202
15:30 - 16:00	<b>Coffee Break / Poster Session</b> Location: Atrium		
16:00 - 17:30	<b>PI3: Shells</b> Location: C206	<b>TC8_3: Session of ECCS TC8 – 3</b> Location: C202	
19:00 - 21:00	<b>Conference Banquet</b> Location: Malostranský Palace		

**12/9**

**08:30-10:00 • B286**

## **K2: Keynote lectures**

Session Chair: Esther Real, Universitat Politècnica de Catalunya

Session Chair: Josef Machacek, Czech Technical University in Prague

---

**8:30 am - 9:00 am**

### **Design by Advanced Analysis – 2016 AISC Specification**

Ziemian, Ronald

*Bucknell University, Lewisburg, Pennsylvania, USA*

**9:00 am - 9:30 am**

### **Stability design of steel structures: From members to plates and shells**

Simões da Silva, Luís

*ISISE, Department of Civil Engineering, University of Coimbra, Portugal*

**9:30 am - 10:00 am**

### **Cold-formed high strength steel RHS under combined bending and web crippling**

Young, Ben

*The Hong Kong Polytechnic University, Hong Kong (China)*

**12/9**

**10:30-12:15 • C204**

## **Fire 1: Fire**

Session Chair: Nuno Lopes, University of Aveiro

Session Chair: Sheida Afshan, Southampton University

---

**10:30 am - 10:45 am**

### **Fire design of class 4 tapered steel beams with the General Method – a proposal**

Maia, Élio

*University of Aveiro, Portugal*

**10:45 am - 11:00 am**

### **Behaviour of slender plates in case of fire of different stainless steel grades**

Arrais, Flávio

*RISCO - Civil Engineering Department, University of Aveiro, Portugal*



**11:00 am - 11:15 am**

**Critical loads of semi-rigid columns subjected to non-linear temperature distributions**

Xu, Lei

*University of Waterloo, Canada*

**11:15 am - 11:30 am**

**Numerical investigation of thin-walled CFS columns in fire**

Craveiro, Helder D.

*ISISE – Institute for Sustainability and Innovation in Structural Engineering, Department of Civil Engineering, University of Coimbra, Portugal*

**11:30 am - 11:45 am**

**Numerical modelling of cold formed steel members at elevated temperatures**

Arrais, Flávio

*University of Aveiro, Portugal*

**11:45 am - 12:00 pm**

**Assessment of Eurocode Fire Design Rules for Structural Members Made of High Strength Steels**

Couto, Carlos

*University of Aveiro, Portugal*

**12:00 pm - 12:15 pm**

**GBT-based semi-analytical solutions for the elastic/plastic stability analysis of stainless steel thin-walled columns exposed to fire**

Gonçalves, Rodrigo de Moura

*CERIS and Universidade NOVA de Lisboa, Portugal*

**12/9**

**10:30-12:15 • C206**

**PI1: Plates**

Session Chair: Ronald Ziemian, Bucknell University

Session Chair: Eiki Yamaguchi, Kyushu Institute of Technology

---

**10:30 am - 10:45 am**

**Solutions to simplified von Karman plate equations**

Becque, Jurgen

*The University of Sheffield, United Kingdom*

**10:45 am - 11:00 am**

**On the modal buckling of longitudinally stiffened plates**

Adany, Sandor

*Budapest University of Technology and Economics, Hungary*

**11:00 am - 11:15 am**

**Modal analysis of thin-walled members with transverse plate elements using the constrained finite element method**

Hoang, Trung

*Budapest University of Technology and Economics, Hungary*

**11:15 am - 11:30 am**

**An analytical solution for the compressed simply-supported plate with initial geometric imperfections**

Nedelcu, Mihai

*Technical University of Cluj-Napoca, Romania*

**11:30 am - 11:45 am**

**Plastic collapse loads of rectangular plate assemblies with constant and linear load distribution**

Stehr, Sebastian

*University of Duisburg-Essen, Germany*

**11:45 am - 12:00 pm**

**Enhanced buckling capacity of axially compressed, stiffened plates taking into account the shear-lag effect**

Jäger-Cañás, Andreas

*EHS beratende Ingenieure für Bauwesen GmbH*

**12:00 pm - 12:15 pm**

**Statistical evaluation of the bearing capacity of polygonal short columns**

Sabau, Gabriel

*Luleå University of Technology, Sweden*

**12/9**

**10:30-12:15 • C202**

**TC8\_1: Session of ECCS TC8 - 1**

Session Chair: Richard Stroetmann, Technische Universität Dresden

Session Chair: Andreas Taras, Bundeswehr University Munich

---

**10:30 am - 10:45 am**

**About ECCS and its Committee TC8 on Stability of Steel Structures**

Snijder, Bert

*Eindhoven University of Technology, The Netherlands*

**10:45 am - 11:00 am**

**Direct Strength Method (DSM) Design of Simply Supported Short-to-Intermediate Hot-Rolled Steel Equal-Leg Angle Columns**

Camotim, Dinar

*Instituto Superior Técnico, Universidade de Lisboa, Lisbon, Portugal*

**11:00 am - 11:15 am**

**Appropriate spring stiffness models for the end support of bolted single steel angle members in compression**

Kettler, Markus

*Graz University of Technology, Austria*

**11:15 am - 11:30 am**

**Stability Design of Cable-Stayed Columns**

Tankova, Trayana

*ISISE – Department of Civil Engineering, University of Coimbra, Portugal*

**11:30 am - 11:45 am**

**Buckling and Strength of Prestressed Steel Stayed Columns**

Machacek, Josef

*Czech Technical University in Prague, Czech Republic*

**11:45 am - 12:00 pm**

**Effect of the steel grade on equivalent initial imperfections for lateral-torsional buckling**

Knobloch, Markus

*Ruhr-Universität Bochum, Institute of Steel, Lightweight and Composite Construction, Germany*

**12:00 pm - 12:15 pm**

**Experimental study of cold-formed high strength steel circular hollow sections**

Meng, Xin

*Imperial College London, United Kingdom*

**12/9**

**13:30-14:00 • Atrium**

**Poster Session**

---

**Buckling length assessment with finite element approach**

Tiainen, Teemu

*Tampere university of technology, Finland*

**Development of an innovative multi-performance system for LWS structures**

Campiche, Alessia

*University of Naples "Federico II", Italy*

**Experimental verification of lateral-torsional buckling of steel I beam with tapered flanges**

Kuś, Juliusz

*Opole University of Technology, Poland*

**Seismic design of two-storey X-bracings**

Costanzo, Silvia

*Univeristy of Naples Federico II, Italy, Department of Structures for Engineering and Architecture*

**Laser technology for innovative connections in steel construction – an overview of the project LASTEICON**

Degée, Hervé

*Hasselt University, Belgium*

**Proposal for improving the consistency between Eurocode 3-1-8 and Eurocode 8-1**

Stratan, Aurel

*Politehnica University of Timisoara, Romania*

**Studying bolt force distribution in ultra-large capacity end-plate connections**

El Aghoury, Ihab

*ASU, Egypt*

**Experimental verification of shear connection of thin-walled steel built up members**

Horáček, Martin

*Brno University of Technology - Faculty of Civil Engineering, Czech Republic*

**Fatigue failure of skew beam grid steel bridges – causes and assessment**

El Aghoury, Mohamed

*Structural Engineering & Construction Management Dept., Future University in Egypt, Cairo, Egypt*

**Numerical investigation of steel Built-up Columns Composed of Track and Channel Cold-Formed Sections**

El Aghoury, Mohamed

*Structural Engineering & Construction Management Dept., Future University in Egypt, Cairo, Egypt*

**12/9**

**14:00-15:30 • C204**

## **Fire 2: Fire**

Session Chair: Hervé Degée, Hasselt University

Session Chair: Carlos Couto, University of Aveiro

---

**2:00 pm - 2:15 pm**

**Numerical simulation and analysis of axially restrained stainless steel beams in fire**

Afshan, Sheida

*Brunel University London, London, United Kingdom*

**2:15 pm - 2:30 pm**

**Buckling of Circular Hollow Section Stainless Steel Columns in Fire**

Mohammed, Asif

*Brunel University London, United Kingdom*

**2:30 pm - 2:45 pm**

**Ultimate Strength Analysis of Steel-Concrete Cross-Sections at Elevated Temperatures**

Chiorean, Cosmin-Gruia

*Technical University of Cluj-Napoca, Romania*

**2:45 pm - 3:00 pm**

**Numerical advanced analysis of steel-concrete composite beams and columns under fire**

Silveira, Ricardo

*Federal University of Ouro Preto*

**3:00 pm - 3:15 pm**

**The Fire Behavior of Extended Stiffened Joint Designed for Seismic Actions**

Tartaglia, Roberto

*University of Naples Federico II, Italy*

**3:15 pm - 3:30 pm**

**A quasi-static nonlinear analysis for assessing the fire resistance of steel 3D frames exploiting time-dependent yield surfaces**

Magisano, Domenico

*UNICAL, Italy*



14:00-15:30 • C206

**PI2: Plates: shear, patch loading; Shells**

Session Chair: Rolando Chacón, Universitat Politècnica de Catalunya

Session Chair: M. Kotelko, Lodz University of Technology

---

**2:00 pm - 2:15 pm**

**Nonlinear finite element analysis of delta girders subjected to patch loading**

Graciano, Carlos

*Universidad Nacional de Colombia, Facultad de Minas, Sede Medellín, Departamento de Ingeniería Civil, A.A. 75267, Medellín, Colombia;*

**2:15 pm - 2:30 pm**

**Critical buckling load on transversally and longitudinally stiffened steel plate girders subjected to patch loading**

Herrera, Juan

*Universitat Politècnica de Catalunya, Spain*

**2:30 pm - 2:45 pm**

**Experimental and numerical studies on shear behaviour of stainless steel plate girders with inclined stiffeners**

Chen, Xiaowan

*Wuhan University, People's Republic of China;*

**2:45 pm - 3:00 pm**

**Experimental and numerical investigations of unstiffened steel girders with non-rectangular panels subjected to bending and shear**

Pourostad, Vahid

*Institut of Structural and Design, University of Stuttgart*

**3:00 pm - 3:15 pm**

**Plastic buckling of moderately thick circular rings under uniform lateral loading**

Guarracino, Federico

*University of Naples "Federico II", Italy*

**3:15 pm - 3:30 pm**

**Considering Realistic Weld Imperfections in Bearing Capacity Calculations of Ring-Stiffened Shells using the Analytical Numerical Hybrid Model**

Li, Zheng

*Brandenburg University of Technology, Germany*

**12/9****14:00-15:30 • C202****TC8\_2: Session of ECCS TC8 - 2**

Session Chair: Markus Knobloch, Ruhr-Universität Bochum

Session Chair: Leroy Gardner, Imperial College London

**2:00 pm - 2:15 pm****Stability of double symmetric sections subjected to axial force, bending moments and torsion**

Jörg, Fabian

*University of Stuttgart, Germany***2:15 pm - 2:30 pm****Experimental study on LTB behaviour and residual stresses of welded I-section members**

Schaper, Lukas

*Ruhr-Universität Bochum, Germany***2:30 pm - 2:45 pm****Buckling resistance of mono-symmetric I-/H-section members in biaxial bending, axial compression, and torsion**

Bours, Anna-Lena

*Ruhr-Universität Bochum, Institute of Steel, Lightweight and Composite Construction, Germany***2:45 pm - 3:00 pm****Assumption of imperfections for the LTB-design of members based on EN 1993-1-1**

Stroetmann, Richard

*Technical University of Dresden, Germany***3:00 pm - 3:15 pm****Stability interaction effects in 3D steel frames – a case study**

Snijder, Bert

*Eindhoven University of Technology, The Netherlands***3:15 pm - 3:30 pm****Simplified method for lateral torsional buckling of beams with lateral restraints**

Bureau, Alain

*CTICM, France*



**12/9**

**16:00-17:30 • C206**

**PI3: Shells**

Session Chair: Rodrigo de Moura Gonçalves, NOVA University Lisbon

Session Chair: Kikuo Ikarashi, Tokyo Institute of Technology

---

**4:00 pm - 4:15 pm**

**Stability of axially compressed cylindrical shells made of stainless steel for different imperfection patterns**

Azizi, Esmaeil

*University of Duisburg-Essen, Germany*

**4:15 pm - 4:30 pm**

**Axial buckling behavior of welded ring-stiffened shells**

Jäger-Cañás, Andreas

*EHS beratende Ingenieure für Bauwesen GmbH*

**4:30 pm - 4:45 pm**

**Buckling Assessment of Cylindrical Steel Tanks with Top Stiffening Ring under Wind Loading**

Zeybek, Özer

*Department of Civil Engineering, Middle East Technical University, Ankara, Turkey*

**4:45 pm - 5:00 pm**

**Stability of ring stiffened steel liners under external pressure – Comparison of the existing design concept with 3D-FEM analysis**

Ecker, Alexander

*Graz University of Technology, Austria*

**5:00 pm - 5:15 pm**

**Ultimate shear resistance of cylindrically curved steel panels**

Ljubinkovic, Filip

*ISISE, Portugal*

**5:15 pm - 5:30 pm**

**Accurate and efficient a-posteriori account of geometrical imperfections in Koiter for elastic solid-like shells**

Magisano, Domenico

*UNICAL, Italy*

**12/9**

**16:00-17:30 • C202**

**TC8\_3: Session of ECCS TC8 - 3**

Session Chair: Bert Snijder, Eindhoven University of Technology

Session Chair: Dinar Camotim, Instituto Superior Técnico, University of Lisbon

---

**4:00 pm - 4:15 pm**

**Proposal of a design curve for the overall resistance of hollow section members**

Taras, Andreas

*Bundeswehr University Munich, Germany*

**4:15 pm - 4:30 pm**

**A Comparative Analysis on the Stability and Ultimate Strength of Steel Plated Girders with Planar and Corrugated Webs**

Serna, Miguel Ángel

*University of Cantabria, Spain*

**4:30 pm - 4:45 pm**

**Validation of the Overall Stability Design Methods (OSDM) for tapered members**

Szalai, József

*ConSteel Solutions Ltd., Hungary*

**4:45 pm - 5:00 pm**

**Sensitivity of the Stiffness Reduction Model Used to Analyze the Ultimate Load Condition of Steel Frames**

Rosson, Barry

*Florida Atlantic University, United States of America*

**5:00 pm - 5:15 pm**

**Improve load capacity calculations by considering realistic weld imperfections for plates and shells**

Stapelfeld, Christoph

*Brandenburg University of Technology, Germany*

**5:15 pm - 5:30 pm**

**Buckling Analysis of Circular Arches with Trapezoidal Corrugated Web**

Serna, Miguel Ángel

*University of Cantabria, Spain*

<b>Friday 13/9</b>			
<b>08:30 - 10:00</b>	<b>Plenary Session + Tomáš Vraný SDSS Award</b> Location: B286		
<b>10:00 - 10:30</b>	<b>Coffee Break</b> Location: Atrium		
<b>10:30 - 12:15</b>	<b>CFS3: Cold formed steel, built-up members</b> Location: C202	<b>Seismicity: Seismic design</b> Location: C206	<b>Structures 1: Structures</b> Location: C204
<b>12:15 - 13:45</b>	<b>Lunch</b> Location: Atrium		
<b>13:45 - 15:00</b>	<b>CFS4: Cold formed steel</b> Location: C202	<b>Structures 2: Bridges</b> Location: C204	
<b>15:00 - 15:30</b>	<b>Closing Session</b> Location: C202		
<b>15:30 - 16:00</b>	<b>Conference Close and Farewell Drink</b> Location: Atrium		

**T3/9**

**08:30-10:00 • B286**

**Pn: Plenary session**

Session Chair: E. Mirambell, Universitat Politècnica de Catalunya-BarcelonaTech

Session Chair: P. Vila Real, University of Aveiro

---

**8:30 am - 8:45 am**

**On the GNI analysis of simple thin-walled beams with using linear buckling mode as geometric imperfection**

Adany, Sandor

*Budapest University of Technology and Economics, Hungary*

**8:45 am - 9:00 am**

**Calibration of European web-crippling equations for cross-sections with one web**

Misiek, Thomas

*Breinlinger Ingenieure, Germany*

**9:00 am - 9:15 am**

**The capacity of bolted cold-formed steel connections in bending**

Becque, Jurgen

*The University of Sheffield, United Kingdom*

**9:15 am - 9:30 am**

**Tests and Design of Built-up Section Columns**

Rasmussen, Kim J.R.

*The University of Sydney, Australia*

**9:30 am - 9:45 am**

**Experimental study on the general behaviour of stainless steel frames**

Real, Esther

*Universitat Politècnica de Catalunya, Spain*

**9:45 am – 10:00 am**

**Tomáš Vraný SDSS Award**

# 13/9

10:30-12:15 • C202

## CFS3: Cold formed steel, built-up members

Session Chair: Kim J.R. Rasmussen, University of Sydney

Session Chair: Jelena Dobrić, University of Belgrade Faculty of Civil Engineering

---

**10:30 am - 10:45 am**

### Buckling of Spatial Laced Columns Composed of Built-Up Cold-Formed Steel Channel Members

Bastos, Cristiane Cruzen Daemon d Oliveira

*Federal University of Rio de Janeiro - COPPE, Brazil*

**10:45 am - 11:00 am**

### The influence of stiffeners width on buckling modes of steel LC-beams subjected to bending

Kubiak, Tomasz

*Lodz University of Technology, Poland*

**11:00 am - 11:15 am**

### Numerical investigation of built-up cold-formed steel beams with corrugated web

Ungureanu, Viorel

*Politehnica University of Timisoara, Romania*

**11:15 am - 11:30 am**

### Global buckling strength of built-up cold formed steel columns under compression

Kobashi, Tomoki

*Nippon Steel Corporation, Japan*

**11:30 am - 11:45 am**

### Built-up cold-formed steel beams with web openings

Both, Ioan

*Politehnica University of Timisoara, Romania*

**11:45 am - 12:00 pm**

### Coupled buckling of steel LC-beams under bending

Kubiak, Tomasz

*Lodz University of Technology, Poland*

**12:00 pm - 12:15 pm**

### Distortional buckling of stiffeners in stainless steel profiled sheeting

Jůza, Jan

*Czech Technical University in Prague, Czech Republic*

**13/9****10:30-12:15 • C206****Seismicity: Seismic design**

Session Chair: Luis Calado, ist

Session Chair: Mario D'Aniello, University of Naples Federico II

**10:30 am - 10:45 am****Seismic Response of Steel Dual Eccentrically Braced Frames with Equal-Strength Joints**

Rangelov, Nikolaj

*Department of Steel and Timber Structures, UACEG, Sofia, Bulgaria***10:45 am - 11:00 am****Performances of moment resisting frames with slender steel and composite sections in low and moderate seismic areas**

Degée, Hervé

*Hasselt University, Belgium***11:00 am - 11:15 am****Beam-to-column joints for slim-floor systems in seismic zones: numerical investigations and experimental program**

Ciutina, Adrian

*Politehnica University of Timisoara, Romania***11:15 am - 11:30 am****Seismic design criteria for CFS steel-sheathed shear walls**

Campiche, Alessia

*University of Naples "Federico II", Italy***11:30 am - 11:45 am****A Yielding Criterion for Seismic Gusset Plates in Tension**

Teh, Lip H.

*University of Wollongong, Australia***11:45 am - 12:00 pm****Cyclic plastic behavior of steel material under uniaxial load paths**

Budaházy, Viktor

*Budapest University of Technology and Economics, Hungary***12:00 pm - 12:15 pm****Study on the influence of Reduced Beam Sections on the seismic behaviour of a Moment Resisting Frame**

Jiménez, Adrià

*Universitat Politècnica de Catalunya, Spain*

# 13/9

10:30-12:15 • C204

## Structures 1: Structures

Session Chair: Trayana Tankova, ISISE – Department of Civil Engineering, University of Coimbra

Session Chair: Federico Guarracino, University of Naples "Federico II"

---

**10:30 am - 10:45 am**

**Modelling of the roof bracing system in single-storey industrial buildings**

Gremza, Grzegorz

*Silesian University of Technology, Poland*

**10:45 am - 11:00 am**

**Ultimate bending resistance of pipes: testing arrangements and nonlinear effects**

Guarracino, Federico

*University of Naples "Federico II", Italy*

**11:00 am - 11:15 am**

**Towards automated Identification of Structural Steel Components from 3D-Point Clouds to subsequent GMNA-Stability-Analysis**

Merkl, Christian

*Bundeswehr University Munich, Institute of Structural Engineering, Germany*

**11:15 am - 11:30 am**

**Degradation processes in normalised mild- and low-alloy steel building structures in service**

Hołowaty, Janusz

*West Pomeranian University of Technology Szczecin, Poland*

**11:30 am - 11:45 am**

**Crashworthiness performance of tubular energy absorbing structures with triggers**

Kotełko, Maria

*Lodz University of Technology, Poland*

**11:45 am - 12:00 pm**

**Nonlinear behavior and instability of deployable arches**

Goncalves, Paulo Batista

*Pontifical Catholic University, PUC-Rio, Brazil*

**12:00 pm - 12:15 pm**

**Static effects of modular structures made of containers**

Miller, Ondřej

*Fakulta stavební VŠB-TU Ostrava*

**13/9**

**13:45-15:00 • C202**

**CFS4: Cold formed steel**

Session Chair: Michal Jandera, Czech Technical University in Prague

Session Chair: Ioan Both, University Politehnica of Timisoara

---

**1:45 pm - 2:00 pm**

**Failure plastic mechanisms in TWCFS columns under eccentric compression**

Kotełko, Maria

*Romanian Academy - Timisoara Branch*

**2:00 pm - 2:15 pm**

**Strength characterisation of a CFS section with initial geometric imperfections**

Hashmi, Syed Suhel Ahmed Syed Iqbal

*Marathwada Institute of Technology, Aurangabad, India*

**2:15 pm - 2:30 pm**

**Elastic buckling strength of lipped channel section beams restrained on upper flange subjected to bending**

Masuda, Hiroto

*Tokyo Institute of Technology, Japan*

**2:30 pm - 2:45 pm**

**Experimental and analytical study of Cold-Formed Steel (CFS) single-stud walls sheathed with FCB, CSB and MgO under compression**

Dewangan, Abhinav

*National Institute of Technology, Raipur, India*

**2:45 pm - 3:00 pm**

**Analytical Assessment of CFS Wall-Panels Sheathed with MgO Board**

Dewangan, Abhinav

*National Institute of Technology, Raipur, C.G., India*



# 13/9

13:45-15:00 • C204

## Structures 2: Bridges

Session Chair: Pavel Ryjáček, Czech Technical University in Prague

---

**1:45 pm - 2:00 pm**

**Influence of collision damage on load-carrying capacity of steel girder**

Yamaguchi, Eiki

*Kyushu Institute of Technology, Japan*

**2:00 pm - 2:15 pm**

**On the development of IoT platforms for the detection of damage in steel railway bridges**

Chacón, Rolando

*Department of Civil and Environmental Engineering, Universitat Politècnica de Catalunya, Spain*

**2:15 pm - 2:30 pm**

**Bracing Details for Trapezoidal Steel Box Girders**

Helwig, Todd

*University of Texas at Austin*

**2:30 pm - 2:45 pm**

**Material Strength Statistics and Reliability Aspects for the Reassessment of End-of-Service-Life Steel Bridges**

Kroyer, Robert

*Bundeswehr University Munich, Institute of Structural Engineering, Germany*

**2:45 pm - 3:00 pm**

**Thermorheological Testing and Modelling of Seismic Bearing Elastomers**

Treib, Caroline

*University of German Armed Forces Munich, Germany, Germany*

## Saturday 14/9

08:30 - 17:00

**Optional Trip to Kutná Hora**

Location: Kutná Hora

**sdss2019.cz**