Tuesday, June 14, 2016

8.30/9.00 Welcome – Registration
9.00/9.30 Opening Ceremony

**Session 1: Snow drift I**
*Chair: P. Irwin, T. Fukuhara*

**09.30**  
*Keynote Lecture - Numerical simulation of snowdrift around buildings: past achievements and future perspectives*  
Yoshihide Tominaga  
Niigata Institute of Technology, Department of Architecture and Building Engineering, Japan

**10.00**  
*Improvements of the viscous treatment of the snow phase in two-way coupled Eulerian-Eulerian simulations of drifting snow*  
Ziad Boutanios 1,2 and Hrvoje Jasak 2  
1 Binkz Incorporated, Canada  
2 CFD Lab, FSB, University of Zagreb, Croatia

**10.20**  
*CFD prediction of snowdrift in a building array*  
Tsubasa Okaze 1,2, Saeka Kato 2, Yoshihide Tominaga 3, Akashi Mochida 4  
1 Tokyo Institute of Technology, Japan  
2 Takenaka Corporation, Japan  
3 Niigata Institute of Technology, Japan  
4 Tohoku University, Japan

**10.40**  
Coffee break

**11.10**  
*Outdoors experiments of snowdrift on typical cubes based on axial flow fan matrix in Harbin*  
Mengmeng Liu 1,2, Qingwen Zhang 1,2, and Feng Fan 1,2  
1 School of Civil Engineering, Harbin Institute of Technology, China  
2 Key Lab of Structures Dynamic Behavior and Control of China Ministry of Education, Harbin Institute of Technology, China

**11.30**  
*Numerical simulation of snowdrift on a membrane roof and wind-induced response analysis under coupled wind and snow loads*  
Sun Xiaoying, He Rijin, Wu Yue  
Key Lab of Structure Dynamic Behaviour and Control of the Ministry of Education, Harbin Institute of Technology, China

**11.50**  
*Developing experimental method for investigating snow deposition around buildings using snow substitutes*  
Jennifer Fiebig, Hans Holger Hundborg Koss  
Technical University of Denmark (DTU), Dep. of Civil Engineering, Denmark

**12.10**  
*Use of numerical simulations of snow drift in planning of infrastructure – A case study from Northern Norway*  
Thomas Kringlebotn Thiis 1,2  
1 Norwegian University of Life Sciences, Norway  
2 Multiconsult ASA, Norway

**12.30**  
Lunch
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Presenter(s)</th>
</tr>
</thead>
</table>
| 13.50 | **Keynote Lecture** - Probabilistic concepts in snow engineering - from observations to the specification of consistent design values including climate change | Michael Kasperski  
Ruhr-Universität Bochum, Research Team EKIB, Germany                                                                 |
| 14.20 | **Climate Change: impact on snow loads on structures**                                            | Pietro Croce, Paolo Formichi, Filippo Landi and Francesca Marsili  
University of Pisa, Department of Civil and Industrial Engineering-Structural Division, Italy |
| 14.40 | **European snow load map – past and present**                                                     | Jerzy Antoni Żurański and Grzegorz Kimbar  
Instytut Techniki Budowlanej, ul. Filtrowa 1, 00-611 Warszawa, Poland                                                 |
| 15.00 | **Some ongoing researches to improve codified structural design under snow loads in China**       | Feng Fan¹,² Huamei Mo¹, Qingwen Zhang¹,², Guolong Zhang¹ and Mengmeng Liu¹  
¹ School of Civil Engineering, Harbin Institute of Technology, Harbin, 150090, China  
² Key Lab of Structures Dynamics Behavior and Control of the Ministry of Education (Harbin Inst. of Tech.), Harbin, 150090, China |
| 15.20 | Coffee break                                                                                        |                                                                                                                        |
| 15.40 | **Poster session**                                                                                  | Chair: T. Thiis, P. Delpech                                                                                           |
| 16.00 | **Specification of the design value of the ground snow load considering measurements of the snow height – part 1: single stations** | Benjamin Czwikla, Michael Kasperski  
Ruhr-Universität Bochum, Research Team EKIB, Germany                                                                   |
| 16.20 | **Research on reliability of roof structures designed by Chinese codes**                          | Shengguan Qiang, Xuanyi Zhou, Ming Gu  
State Key Laboratory of Disaster Reduction in Civil Engineering, Tongji University, China                               |
| 16.40 | **Correction Of The Snow Load Design Values In The Places Of Height Discontinuity**              | Sergey Pichugin¹, Yuriy Dryzhryuk²  
¹ Department of Metal, Wooden and Plastic Structures, Poltava National Technical Yuri Kondratyuk University, 36000, Poltava, Ukraine  
² Department of Engineering Management and Technology and Occupation Safety, Poltava National Technical Yuri Kondratyuk University, 36000, Poltava, Ukraine |
| 17.00 | End day 1                                                                                            |                                                                                                                        |
Wednesday, June 15, 2016

08.30 Welcome

Session 3 : Avalanche / Snow physics
Chair : S. Margreth, A. Klein-Paste

08.50 Keynote Lecture - Importance of field measurements and observation systems in snow engineering: from avalanches dynamics to drifting snow
Florence Naaïm
Institut national de recherche en sciences et technologies pour l'environnement et l'agriculture, France

09.20 Effect of reporting rate on vulnerability with an example for snow avalanche risk to backcountry recreationists in Canada
Bruce Jamieson 1,2 and Alan S.T. Jones 3
1 Snowline Associates Ltd., Canada
2 Dept. of Civil Engineering, University of Calgary, Canada
3 Dynamic Avalanche Consulting Ltd., Canada

9.40 Seismic responses of snowpack on a slope in a vibration experiment
Yusuke Harada 1, Wataru Takahashi 1, Satoshi Omiya 1, Hiroki Matsushita 2, Takahiro Chiba 3 and Masaru Matsuzawa 1
1 PWRI, Civil Engineering Research Institute for Cold Region, Japan
2 PWRI, Snow Avalanche and Land Slide Research Center, Japan
3 Hokkaido University of Science, Japan

10.00 Friction along a slider on snow
Werner Nachbauer 1, Sebastian Rohm 1, Christoph Knoflach 1, Joost van Putten 2, Michael Hasler 2
1 Centre of Technology of Ski and Alpine Sports, University of Innsbruck, Austria
2 Department of Sports Science, University of Innsbruck, Austria

10.20 Gliding friction of back country climbing skins
Michael Hasler 1, Sebastian Rohm 1, Christoph Knoflach 1, Joost van Putten 2 and Werner Nachbauer 1,2
1 Centre of Technology of Ski and Alpine Sports, University of Innsbruck, Austria
2 Department of Sports Science, University of Innsbruck, Austria

10.40 Coffee break

Session 4 : Snow Physics / Snow drift II
Chair : K. Szilder, Y. Tominaga

11.10 Characterizing the snowpack stratigraphy and its mechanical stability with hardness profiles measured by the Avatech SPI
Pascal Hagenmuller, Thibault Pilloix
Météo-France/CNRS, CNRM-GAME/CEN, France

11.30 Improvement of requirements for modeling snowdrifts in wind tunnels based on the measurements at Harbin
Qingwen Zhang 1,2, Guolong Zhang 1,2 and Feng Fan 1,2
1 School of Civil Engineering, Harbin Institute of Technology, China
2 Key Lab of Structures Dynamic Behavior and Control of China Ministry of Education, Harbin Institute of Technology, China

11.50 A new method for predicting snowdrift on flat roofs
Luyang Kang, Xuanyi Zhou and Ming Gu
State Key Lab of Disaster Reduction in Civil Engineering, Tongji University, China
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<th>Time</th>
<th>Session Title</th>
<th>Speaker(s)</th>
<th>Institution(s)</th>
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<tbody>
<tr>
<td>12.10</td>
<td>Improved Design Relations for Roof Snow Drifts</td>
<td>Michael O'Rourke(^1) and John Cocca(^2)</td>
<td>(^1) Rensselaer Polytechnic Institute, USA (^2) Wiss, Janney, Elstner Associates, Inc., USA</td>
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<td>12.30</td>
<td>Lunch</td>
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<td></td>
<td><strong>Session 5 : Structural Loading II</strong></td>
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<td><strong>Chair : A. Flaga, A. Aldea</strong></td>
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<tr>
<td>14.00</td>
<td>Specification of the design value of the ground snow load considering measurements of the snow height – part 2: regional approach</td>
<td>Michael Kasperski, Benjamin Czwikla</td>
<td>Ruhr-Universität Bochum, Research Team EKIB, Germany</td>
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<tr>
<td>14.20</td>
<td>Collapse process of pipe-framed greenhouses under snow loading</td>
<td>Kazuya Takahashi, Yasushi Uematsu</td>
<td>Department of Architecture and Building Science, Tohoku University, Japan</td>
</tr>
<tr>
<td>14.40</td>
<td>Study on evaluation of roof snow load considering rain-on-snow surcharge: Statistical evaluation of snow cover and precipitation in winter in Japan</td>
<td>Masaya Otsuki(^1), Toru Takahashi(^2), Yoshihiko Saito(^1), Takuya Tsutsumi(^3) and Kikitsu Hitomitsu(^4)</td>
<td>(^1) Yukiken Snow Eaters Co., Ltd., Japan (^2) Department of Architecture, Chiba University, Japan (^3) Northern Regional Building Research Institute, Japan (^4) National Institute for Land and Infrastructure Management, Japan</td>
</tr>
<tr>
<td>15.00</td>
<td>Structural Damage Caused by Rain-on-snow Load in Japan</td>
<td>Toru Takahashi(^1), Takahiro Chiba(^2) and Kazuki Nakamura(^3)</td>
<td>(^1) Department of Architecture, Chiba University, Japan (^2) Department of Architecture, Hokkaido University of Science, Japan (^3) National Research Institute for Earth Science and Disaster Prevention, Japan</td>
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<td>15.20</td>
<td>Coffee break</td>
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<td>Poster session</td>
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<td><strong>Chair : T. Thiis, P. Delpech</strong></td>
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<tr>
<td>16.00</td>
<td>A new method of predicting slide snow load for sloped roofs</td>
<td>Xuanyi Zhou, Jiuliang Li, Peng Huang, Ming Gu and Lulu Sun</td>
<td>State Key Laboratory of Disaster Reduction in Civil Engineering, Tongji University, China</td>
</tr>
<tr>
<td>16.20</td>
<td>Experimental study of the distribution of snow deposits on the surface of structures with complex three-dimensional shape of the roof</td>
<td>Poddaeva Olga(^1), Pavel Churin(^2)</td>
<td>(^1) Moscow State University Of Civil Engineering (Mgsu), Russian Federation (^2) Moscow State University Of Civil Engineering (Mgsu) Russian Federation</td>
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<tr>
<td>16.40</td>
<td>Theoretical and experimental study of ice accretion due to freezing rain on an inclined cylinder</td>
<td>Krzysztof Szilder</td>
<td>Aerospace, National Research Council, Canada</td>
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<tr>
<td>17.00</td>
<td>Parametric approach for assessing risks due to falling ice and snow</td>
<td>Jan Dale, Scott Gamble, Albert Brooks and Jill Bond</td>
<td>Rowan Williams Davies &amp; Irwin Inc., Canada</td>
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<td>17.30</td>
<td>Technical tour: Ecole Centrale de Nantes</td>
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<td>Time</td>
<td>Session 6: Building / Simulation</td>
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<tr>
<td>08.30</td>
<td>Welcome</td>
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</table>
| 08.50 | **Keynote Lecture** - Prediction of snow loads: past, present and future  
  Peter A. Irwin  
  Rowan Williams Davies and Irwin Inc., Canada. |
| 09.20 | **CFD simulation of drift snow loads for an isolated gable-roof building**  
  Yoshihide Tominaga¹, Tsubasa Okaze² and Akashi Mochida³  
  ¹Niigata Institute of Technology, Japan  
  ²Tokyo Institute of Technology, Japan  
  ³Tohoku University, Japan |
| 09.40 | **Analysis of Snow Drifts on Arch Roofs**  
  Michael O’Rourke¹, Jan Potac² and Thomas Thiis³  
  ¹Rensselaer Polytechnic Institute, USA  
  ²Multiconsult ASA, Norway  
  ³Norwegian University of Life Sciences, Norway |
| 10.00 | **Falling snow and ice from buildings and structures: risk assessment and mitigation – two case studies**  
  Stefan Margreth  
  WSL Institute for Snow and Avalanche Research SLF, 7260 Davos Dorf, Switzerland |
| 10.20 | **Capture of windward drift snow**  
  Jan Potac¹, Michael O’Rourke² and Thomas K. Thiis³  
  ¹Multiconsult AS, Norway  
  ²Rensselaer Polytechnic Institute, USA  
  ³Norwegian University of Life Sciences, Norway |
| 10.40 | Coffee break |

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<tr>
<th>Time</th>
<th>Session 6: Building / Simulation (continued)</th>
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| 11.10 | **Wind tunnel tests and analysis of snow load distribution on three different large size stadium roofs**  
  Andrzej Flaga¹, Łukasz Flaga²  
  ¹Prof.D.Sc.Eng. Andrzej Flaga, Wind Engineering Laboratory, Faculty of Civil Engineering,  
  Cracow University of Technology, Poland  
  ²Ph.D.Eng Arch. Łukasz Flaga, Faculty of Civil Engineering, Department of Technology of Building and Materials Processes, Częstochowa University of Technology, Poland |
11.30  **Comparison of Physical Snow Accumulation Simulation Techniques**  
*Albert Brooks, Scott Gamble, Jan Dale and Jill Bond*  
*Rowan Williams Davies and Irwin (RWDI), Guelph, Ontario, CA*

11.50  **Snowdrifts on two-level building roofs and modeling of snow density at Harbin**  
*Guolong Zhang¹ ², Yu Zhang¹ ² and Feng Fan¹ ²*  
¹School of Civil Engineering, Harbin Institute of Technology, China  
²Key Lab of Structures Dynamic Behavior and Control of China Ministry of Education, Harbin Institute of Technology, China

12.10  **Advantages and Features of Four Different Snow Utilizing Facilities**  
*Seiji Kamimura¹, Yoshiomi Ito² and Junki Zen³*  
¹Nagaoka University of Technology, Department of Mechanical Engineering, Japan  
²Yuki-daruma (snowman) Foundation, Japan  
³Nagaoka University of Technology, Graduate School of Engineering, Japan

12.30  Lunch

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<tr>
<th>Time</th>
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| 13.30 | Technical tour: CSTB Wind tunnels: Boundary layer Wind tunnels  
         Climatic Wind tunnel: snow test demonstration |
| 16.00 | Social program  
         Bus transfer to Les Machines de l’île and guided walking tour of Nantes Downtown |
| 20.00 | Gala Dinner at O’Deck Restaurant |
Friday, June 17, 2016

**Session 7 : Transport**

**Chair : P. Hagenmuller, A. Mc Callum**

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<tr>
<th>Time</th>
<th>Title</th>
<th>Authors and Affiliations</th>
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</table>
| 9.00  | Modelling the thermal conductivity of melting snow layers on heated pavements | Anne Nuijten¹, Knut Vilhelm Høyland²,², Cor Kasbergen¹ and Tom Scarpas³  
¹NTNU, Department of Civil and Transport Engineering, Norway  
²Sustainable Arctic Marine and Coastal Technology (SAMCoT), Centre for Research-based Innovation (CRI), Norwegian University of Science and Technology, Norway  
³TU Delft, Department of Structural Engineering, the Netherlands |
| 9.20  | Snow engineering questions related to road and rail vehicles         | Jean-Paul Bouchet, Sylvain Aguinaga, Pierre Palier and Philippe Delpech, Centre Scientifique et Technique du Bâtiment, CAPE Department, France |
| 9.40  | Appreciation of road surface temperature in an urban context to appreciate the possibility of snow accumulation and ice occurrence on pavement | Abderrahmen Khalifa¹,²,³ Mario Marchetti², Ludovic Bouillard², Eric Martin⁴, Michel Bues⁵ and Katia. Chancibaut⁴  
¹IFSTTAR, Centre de Nantes, France  
²Cerema - DTer Est - LR Nancy, France  
³Météo France, Direction de la Production, France  
⁴CNRM-GAME (Météo-France, CNRS), France  
⁵Université de Lorraine, UMR 7359-GeoRessources CNRS/UL/CREGU, ENSG, France |
| 10.00 | Anti- and de-icing of walking and cycle paths – Field trials of new follow-up techniques for quantifying salt amount and resulting ice quality | Göran Blomqvist, Bengt Lindström, Ida Järskog, Emelie Karlsson and Anna Niska  
Swedish National Road and Transport Research Institute (VTI), Sweden |
| 10.20 | Shallow Geothermal Switch Point Heating System                       | Lars Staudacher¹, Damian Schink², Dr. Roman Zorn³, Dr. Hagen Steger⁴  
¹Bavarian Center for Applied Energy Research, Germany  
²Pintsch Abeng geotherm GmbH, Germany  
³European Institute f. Energy Research (EIFER), Germany  
⁴Karlsruher Institut für Technologie (KIT) Institut für Angewandte Geowissenschaften, Germany |
| 10.40 | Coffee break                                                         |                                                                                                           |

**Session 7 : Transport (continued)**

**Chair : G. Blomqvist, B. Jamieson**

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<tr>
<th>Time</th>
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</table>
| 11.10 | A Method for Estimating Road Friction Coefficients with Ice Film Subjected to Melting by De-icing Agents | Akihiro Fujimoto¹, Shunsuke Tanaka¹, Kenji Sato¹, Roberto Tokunaga¹, Naoto Takahashi¹, Tateki Ishida¹ and Kiyoshi Takeichi²  
¹PWRI, CERI, Japan  
²Hokkai-Gakuen University, Japan |
| 11.30 | Airplane braking friction on dry snow, wet snow or slush contaminated runways | Alex Klein-Paste  
NTNU, dept. of Civil and Transport Engineering, Winter Maintenance Research Group, Norway |
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<tr>
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<tr>
<td>11.50</td>
<td><strong>Engineered Pavements of Snow and Ice</strong></td>
<td>Adrian McCallum and Greg White</td>
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<td>University of the Sunshine Coast, Australia</td>
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<tr>
<td>12.10</td>
<td><strong>Performance of remote road surface sensor on different pavement types</strong></td>
<td>Naoto Takahashi, Kenji Sato and Roberto Tokunaga</td>
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<td>Civil Engineering Research Institute for Cold Region, Traffic Engineering Research Team, Japan</td>
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<td>12.30</td>
<td><strong>Concluding Remark</strong></td>
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<td>12.30</td>
<td>Lunch</td>
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</table>
Poster session

The Protection of Roads from Blizzards
Tatiana Samodurova, Olga Gladysheva, Jurij Baklanov and Konstantin Panferov
Voronezh State University of Architecture and Civil Engineering, Russia

Influence of sunshine hours in fine weather on the rate of Wintry Accidents
Akira Saida, Masayuki Hirase, Naoto Takahashi and Tateki Ishida
Civil Engineering Research Institute for Cold Region, Public Works Research Institute, National Research and Development Agency, Japan

Roof Snow Slide-off Experiments Using Membrane Deformation
Hiroaki Terasaki and Teruyuki Fukuhara
University of Fukui, faculty of engineering, Japan.

Accuracy of Snow Depth Measurements on Roads measured with Photogrammetry
Takahiro Chiba1 and Thomas This2
1Department of Architecture, Faculty of Engineering, Hokkaido University of Science, Japan
2Department of Mathematical Science and Technology, Norwegian University of Life Science, Ås, Norway

A new ring-shaped wind tunnel facility to study wind-packing of snow
Christian G. Sommer1,2, Michael Lehning1,2 and Charles Fierz1
1WSL Institute for Snow and Avalanche Research SLF, Switzerland
2CRYOS, School of Architecture, Civil and Environmental Engineering, EPFL, Switzerland

The use of sheet piles as measures against rapid mass flows
Árni Jónsson1, Guðmundur Heiðreksson2, Torfi B. Jóhannsson3, Magnús Steinarsson1
1Norwegian Geotechnical Institute (NGI), Norway
2Icelandic Road and Coastal Administration (IRCA) Iceland
3MogT Engineering, Iceland

The usage of ratio of geographical height to determine the snow loads in mountain districts in transcarpathian region
Roman Kinasz1,3, Jaroslav Huck2 and Roman Tkach1
1Faculty of Mining and Geoenineering, AGH University of Science and Technology, Poland
2Uzhgorod National University, Ukraine
3National University „Lviv Polytechnic”, Ukraine

In flight wet snow particles characterisation
Philippe Delpech1, Guy Febvre2, Christophe Gourbeyre2, Dominique Lenoir1 and Fabrice De Oliveira1
1Centre Scientifique et Technique du Bâtiment, France
2Laboratoire de Météorologie physique, UMR 6016, France

CR 1-1-3/2012 - the snow loads code in Romania
Alexandru Aldea, Sorin Demetriu, Dan Lungu, Cristian Neagu, Radu Vacareanu and Cristian Arion
Technical University of Civil Engineering Bucharest, Romania
Sponsors
### Technical and Social Program

#### Wednesday, June 15, 2016

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<tr>
<td>17.40 to 18.30</td>
<td><strong>Ecole Centrale de Nantes</strong>&lt;br&gt;One specialty of the Nantes region is ocean engineering.&lt;br&gt;ICSE participants have the opportunity to visit unique facilities operated by Ecole Centrale de Nantes: Towing tank and Wave tank.&lt;br&gt;(Next door to the conference hall)</td>
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#### Thursday, June 16, 2016

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<th>Time</th>
<th>Event</th>
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<tr>
<td>14.00 to 16.00</td>
<td><strong>CSTB, Centre Scientifique et Technique du Bâtiment</strong>&lt;br&gt;Centre Scientifique et Technique du Bâtiment (CSTB) is a public research establishment in the construction sector in France. CSTB core activity covers four major fields: research, technical consultancy, quality assessment and knowledge dissemination.&lt;br&gt;Visit of CSTB wind tunnels: atmospheric boundary layer wind tunnel, climatic wind tunnel (snow test demonstration).</td>
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<td>16.30 to 18.00</td>
<td><strong>Visit of the Galerie des Machines de l’île (transfer by bus)</strong>&lt;br&gt;The Machines de l'île is an unprecedented artistic project. Born from the imagination of François Delarozière and Pierre Orefice, it is located at the crossroads of “invented worlds” of Jules Verne, the mechanical universe of Leonardo da Vinci and the industrial history of Nantes, on the exceptional site of former shipyards.</td>
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<tr>
<td>18.00 to 19.30</td>
<td><strong>Guided walking tour of Nantes Downtown</strong></td>
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<tr>
<td>20.00 to 22.00</td>
<td><strong>Gala Dinner at O’Deck restaurant</strong>&lt;br&gt;O’Deck restaurant offers gourmet cuisine changing with the seasons, drawing inspiration both from the French tradition and the world.</td>
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