



# PROCEEDINGS OF THE 6<sup>TH</sup> INTERNATIONAL CONFERENCE ON CIVIL, STRUCTURAL AND TRANSPORTATION ENGINEERING (ICCSTE'21)

May 17, 2021 - May 19, 2021 | ~~Niagara Falls, Canada~~ | Virtual Conference

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# WELCOME MESSAGE FROM THE CONFERENCE CHAIR

**On behalf of the International Academy of Science, Engineering and Technology (International ASET Inc.), the organizing committee would like to welcome you to the 6<sup>th</sup> International Conference on Civil, Structural and Transportation Engineering (ICCSTE'21).**

ICCSTE'21 is aimed to become one of the leading international annual conferences in the fields related to civil, structural, and transportation engineering. This conference will provide excellent opportunities to the scientists, researchers, industrial engineers, and university students to present their research achievements and to develop new collaborations and partnerships with experts in the field.

ICCSTE is a series of international conferences held annually. These conferences focus on all aspects of civil, structural and transportation engineering. Due to COVID-19, we have made the decision to hold the 6<sup>th</sup> International Conference on Civil, Structural and Transportation Engineering (ICCSTE'21) virtually this year.

In the sixth meeting of this conference, three keynote speakers will share their expertise with the aim of exposing participants to a wide spectrum of applications, and to foster crosspollination of ideas and develop new research interests. In addition, approximately 40 papers will be presented from professors, students, and researchers across the world.

We thank you for your participation and contribution to the 6<sup>th</sup> International Conference of Civil, Structural and Transportation Engineering (ICCSTE'21). We wish you a very successful and enjoyable experience.

**Dr. Khaled Sennah**

*Conference Chair and Proceedings Editor  
ICCSTE'21*

# ABOUT ICCSTE'21

**The 6th International Conference on Civil, Structural and Transportation Engineering (ICCSTE'21) aims to become the leading annual conference in fields related to civil, structural and transportation engineering.** The goal of ICCSTE'21 is to gather scholars from all over the world to present advances in the fields of civil, structural and transportation engineering and to foster an environment conducive to exchanging ideas and information. This conference will also provide an ideal environment to develop new collaborations and meet experts on the fundamentals, applications, and products of the mentioned fields.

ICCSTE is a series of international conferences held annually. These conferences focus on all aspects of civil, structural and transportation engineering. Due to COVID-19, we have made the decision to hold the 6th International Conference on Civil, Structural and Transportation Engineering (ICCSTE'21) virtually this year.

**ICCSTE** is an acronym for **I**nternational **C**onference on **C**ivil, **S**tructural and **T**ransportation **E**ngineering.

The proceedings is published in Niagara Falls, Canada.

All papers were peer-reviewed

The conference proceedings are published under an ISSN and ISBN number

Each paper is assigned a unique DOI number by [Crossref](#)

The conference proceedings are indexed by [Scopus](#) and [Google Scholar](#)

The proceedings are permanently archived in [Portico](#) (one of the largest community-supported digital archives in the world)

Google Scholar

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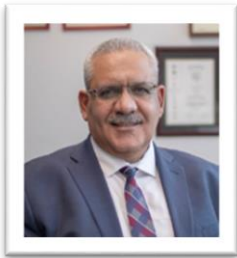
  
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# SCIENTIFIC COMMITTEE

We would like to thank the following for accepting to act as a member of the Scientific Committee for the ICCSTE'21 Congress:

## Scientific Committee Chairs



**Dr. Khaled Sennah**  
**Ryerson University, Canada**  
Conference Chair

## Scientific Committee Members

- Dr. Shahria Alam, The University of British Columbia, Canada
- Dr. Francis Au, University of Hong Kong, Hong Kong
- Dr. Bruno Briseghella, Fuzhou University, China
- Dr. Muntasir Billah, Lakehead University, Canada
- Dr. Said Easa, Ryerson University, Canada
- Dr. Rajeshwar Goodary, Université des Mascareignes, Mauritius
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- Dr. Ayman M. Okeil, Louisiana State University, USA
- Dr. Gianluca Ranzi, University of Sydney, Australia
- Dr. Peter Sebaaly, University of Nevada, Reno, USA
- Dr. Shamim A. Sheikh, University of Toronto, Canada
- Dr. Alp Caner, Middle East Technical University, Turkey
- Dr. Iraj H.P. Mamaghani, University of North Dakota, USA

# KEYNOTE SPEAKERS

The keynote information for the 6<sup>th</sup> International Conference on Civil, Structural and Transportation Engineering (ICCSTE'21) is as follows:



[Dr. Peter E. Sebaaly](#)  
University of Nevada, USA



[Dr. Shamim A. Sheikh](#)  
University of Toronto,  
Canada



[Dr. Shahria Alam](#)  
The University of British  
Columbia, Canada

# ICCSTE'21 KEYNOTE SPEAKERS



**Titles:** High Performance Asphalt Pavements  
Dr. Peter E. Sebaaly, University of Nevada, USA

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Dr. Peter E. Sebaaly is a Professor of Civil Engineering and Director of the Western Regional Superpave Center (WRSC) and the Pavement Engineering & Science (PES) Program at the University of Nevada, Reno (UNR). He is a registered Professional Engineer in the states of Nevada & Arizona, USA. He earned his B.S.C.E. (1982) and M.S.C.E. (1983) from the State University of New York at Buffalo and his Ph.D. (1987) from Arizona State University, specializing in pavements/materials engineering. In 1990, Dr. Sebaaly joined the faculty of the University of Nevada, Reno (UNR). Dr. Sebaaly is currently working on several research projects on the development of new engineered materials to enhance the durability and sustainability of asphalt pavements and the incorporation of these materials into design methods and specifications for maintenance, rehabilitation, and construction of pavements.

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**Titles:** Building Sustainability in New and Existing Concrete Structures with FRP  
Dr. Shamim A. Sheikh, University of Toronto, Canada

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Dr. Shamim A. Sheikh, is a Professor of Civil Engineering at the University of Toronto. He is a past Chair and member of Joint American Concrete Institute-American Society of Civil Engineers Committee 441, Reinforced Concrete Columns, and a member of ACI Committee 374, Performance-Based Seismic Design of Concrete Structures. He currently chairs Committee TSC16 on Structures with FRP for the Canadian Highway Bridge Code. His research interests include earthquake resistance and seismic upgrade of concrete structures, structural sustainability, use of fiber-reinforced polymers in concrete structures and the effects of climate change on structures. He is a recipient of several national and international awards including ACI Structural Research Award, CSCE Horst Leipholz Medal, Fellowship of Canadian Academy of Engineers and Sitara-e-Imtiaz medal from the government of Pakistan.

# ICCSTE'21 KEYNOTE LECTURE



**Titles:** Utilizing Superelastic Shape Memory Alloys to Improve the Seismic Response of Bridges

Dr. Shahria Alam, The University of British Columbia, Canada

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Dr. Shahria Alam is a Professor of Civil Engineering in the School of Engineering and the Tier 1 Principal's Research Chair in Resilient & Green Infrastructure at The University of British Columbia (UBC)'s Okanagan campus. He is serving as the Director of the Green Construction Research & Training Center (GCRTC) at UBC. Dr. Alam is the Chair of the Engineering Mechanics and Materials Division of the Canadian Society for Civil Engineering (CSCE). He received his PhD in Civil Engineering from Western University in 2008. His research interests include smart and recycled materials and their structural engineering applications. He has published more than 300 peer-reviewed articles in these areas. He is the recipient of many national and international awards including CSCE Pratley Award 2015.

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# LIST OF PAPERS

## Earthquake and Structural Engineering

**Title:** Influence of Concrete Compressive Strength on Transfer Length in Pretensioned Concrete Members Using 3D Nonlinear FEM Analysis

**Authors:** Zaher Alkurdi

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**Title:** CFRP Strengthening of Beams in Reinforced Concrete Frames with Openings in Shear Zone

**Authors:** Osama A. Mohamed, Rania M. Khattab

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**Title:** Experience on Earthquake Safety of Large Embankment Dams constructed in Turkey

**Authors:** Hasan Tosun

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**Title:** A Study for immerge VR Applied in RC Building Earthquake Damage Assessment

**Authors:** Ren-Jwo Tsay

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**Title:** Total Risk and Seismic Stability of Existing Large CFRD's in Turkey

**Authors:** Hasan Tosun

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## Earthquake and Structural Engineering

**Title:** Use of Non-Woven Polyethylene Terephthalate (PET) Tissue to improve Certain Properties of Concrete

**Authors:** Sifatullah Bahij, Safiullah Omary, Francoise Feugeas, Amanullah Faqiri

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**Title:** Seismic Response of LNG Storage Tanks under Earthquake Excitations

**Authors:** Iraj H.P. Mamaghani, Wiryachai RoopKumdee

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**Title:** Seismic Resistance and Buckling Strength of Cylindrical Steel Liquid Storage Tanks

**Authors:** Wiriachai Roopkumdee, Iraj H.P. Mamaghani

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**Title:** Investigation on Teardrop Connection of Rack Clad Building

**Authors:** Radin Md Mahirul Hoque, Peng Zhang, M. Shahria Alam, Robert Tremblay

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**Title:** Dynamic Stability of Large Embankment Dams and a Case Study

**Authors:** Hasan Tosun

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## Water and Air Pollutions and Treatments

**Title:** Evaluation Of The Impact Of Pumped Groundwater On The Environment And The Socio Economic Benefits Thereof

**Authors:** Armand J. Beukes, Jeffrey Mahachi, German K. Nkhonjera

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## Transportation Engineering

**Title:** A Methodology Proposal of an Accessible Design for an Urban Intersection to Improve Mobility of People with Physical Disabilities

**Authors:** K Fernández, C Santisteban, A Sánchez

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**Title:** Experimental Investigation on the Performance of Rail Fastening Systems

**Authors:** M. Ali Toprak, Furkan Calim, Emre Gonulcu, M. Fatih Sahin, Ahmet Gullu, Yavuz Durgun, Hakan Saruhan, Ercan Yuksel

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**Title:** Evaluation of Precast/Prestressed Concrete Girder Transport Vehicle Stability

**Authors:** Iraj H.P. Mamaghani, Njiru, Mwaura, Alexander Hasbargen, Arya Alishahi, Barry McAndrews, and Eric Schneider

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**Title:** Assessment of Railway Transport Safety in Bangladesh: A Before-After Study of COVID-19 Case

**Authors:** Armana Huq, Hamim Tasin, Syeda Manila Jannat

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**Title:** Analysis of selected parking characteristics in the Paid Parking Zone - a Case Study Based on City in Poland

**Authors:** Agata Kurek, Elżbieta Macioszek

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**Title:** Analysis of the Variability of Parking Characteristics in A Weekly Distribution in the Conditions of PPZ and DPI Functioning

**Authors:** Agata Kurek , Elżbieta Macioszek

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## Transportation Engineering

**Title:** The Evidence of Critical Issues in Transportation Infrastructures of Bangladesh to Introduce Connected and Autonomous Vehicles

**Authors:** Armana Huq, Kamol Debnath Dip, Nadia Binte Mohammad, Nazmus Sakib

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**Title:** A Bayesian Structural Time Series Model for Assessing Road Traffic Accidents During COVID-19 Period

**Authors:** Armana Huq, Shahrin Islam

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## Environmental Risk Assessments

**Title:** Identifying and Ranking Environmental Risks of Oil and Gas Projects Using the VIKOR Method for Multi-Criteria Decision Making

**Authors:** Sasan Aryaee, Mahdi Ravanshadnia

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**Title:** Ranking Environmental Risks for Promoting HSE Management, Case Study: Oil and Gas Projects

**Authors:** : Sasan Aryaee, Mahdi Ravanshadnia

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**Title:** Georisks and Sustainability Resource of The Mascarene Islands Territories to External Impacts

**Authors:** Viacheslav Iegupov, Rajeshwar Goodary, Yeshvin Goodary

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## Building Materials

**Title:** Aggregate Moisture Content and Fresh Property Control Measures in Cementitious Mortars

**Authors:** Morgan C. Jenkins, Alexander S. Brand

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**Title:** A Preliminary Digital Image Correlation Study of the Anisotropic Mechanical Properties of a 3D-Printed Mortar

**Authors:** Morgan C. Jenkins, Alexander S. Brand, T. Trevor Painter, Samuel T. Sherry

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**Title:** Impact of Dynamic Thermal Conductivity Change of EPS Insulation on Temperature Variation through a Wall Assembly

**Authors:** Maatouk Khoukhi

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**Title:** Interaction between Internal and External Shear Reinforcement for Strengthened RC Deep Beams

**Authors:** Mohamed Ibrahim, Qusai Aborahmeh, Usama Ebead

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**Titles:** A Reliability-Based Comparison of EC3 & SANS 10162-1

**Authors:** Gerald Musa Nkosi, Jeffery Mahachi, Stephen Adeyemi Alabi

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## Concrete Technology

**Titles:** Testing Post Tensioned Slabs with Bonded and Unbonded Tendons

**Authors:** Jasmin Osama Abdelhalim, Ezzeldin Yazeed Sayed-Ahmed

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**Titles:** Utilization of Sewage Sludge Ash in Self-Compacted Concrete

**Authors:** Siham Al Shanti1 Amr El-Dieb, Munjed A. Maraqa

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**Titles:** Experimental Investigations of Eccentrically Loaded Circular Concrete Filled Double Steel Tubular Short Columns

**Authors:** Junchang Ci, Mizan Ahmed, Shicai Chen, Ahmed Hamoda, Khaled Sennah

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## New Technologies, Methods and Techniques in Civil Engineering

**Titles:** Assessment of Civil Engineering Students' Exposure Levels to Active Learning Strategies in the UAE

**Authors:** Melinda J. B. Albuquerque, Francisco Daniel B. Albuquerque

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## Structural Mechanics

**Titles:** A Comparison Investigation into Analysis Methods to Determine the Buckling Capacity of South African Cold-Formed Steel Lipped Channel Sections

**Authors:** Johan van Vuuren, Jeffrey Mahachi

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**Titles:** Strength Properties of Hardwood Timber Species Exposed to Decay and Marine Borer Attack in Tidal Zones

**Authors:** Jeffrey Lynes, Iraj H.P. Mamaghani

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**Titles:** Performance of Roof Anchor Systems for Low-Income Housing in South Africa

**Authors:** Ruben van der Merwe, Jeffrey Mahachi

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**Titles:** Conceptual Framework for a Decision-Making Model to Select the Public-Private Partnership (PPP) Structure for Urban Rail Transit in Jakarta

**Authors:** Retno Ambarsari, Sutanto Soehodho, R Jachrizal Sumabrata

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**Titles:** Glass as a Structural Material: Post-tensioned Glass T-Beam

**Authors:** Emrullah Koca , Ahmet Türer

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**Titles:** Analytical and Experimental Investigation of Post-tensioned Tempered Glass T-Beams

**Authors:** Ahmet Turer , Emrullah Koca

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# JOURNAL PUBLICATION

**Selected articles from the conference will be published in the [International Journal of Civil Infrastructure \(IJCI\)](#) after a secondary review process.**

**The publication fee will be waived for papers that win the best paper award. Other attendees will receive a 25% discount towards the publication fee of the journal.**

This journal has adopted to the open-access model, meaning all free access to the journal's articles and content with no need for subscription. This ensures larger audience and therefore higher citations.

Users are allowed to read, download, copy, distribute, print, search, or link to the full texts of the articles in this journal without asking prior permission from the publisher or the author. This is in accordance with the BOAI definition of open access.

All published papers of IJCI will be submitted to Google Scholar, Microsoft Academic Search, Open J-Gate, Mendeley, Index Copernicus International, Academic Index, Mendeley, Primo Central, and Genomics JournalSeek for possible indexing. Additionally, they will be permanently archived in Portico (one of the largest community-supported digital archives in the world) and will be assigned unique DOIs.

# ICCSTE'22

The 7th International Conference on Civil, Structural and Transportation Engineering (ICCSTE'22) will be held June 5, 2022 - June 7, 2022 | Niagara Falls, Canada.



For inquiries and to obtain further information on the congress,  
please visit the [website](http://www.2022.iccste.com)

You can also email [info@iccste.com](mailto:info@iccste.com) or call us at: +1-613-834-9999

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# ETHICS & MALPRACTICE

## Publication Ethics and Publication Malpractice Statement

The following statement is mainly based on the [Code of Conduct and Best-Practice Guidelines for Journal Editors](#) (Committee on Publication Ethics, 2011).

### Scientific Committee

#### ***Scientific Committee***

Scientific committees consisting of experts in the fields are established. The committees oversee the peer-review and publication process. To see the scientific committee members, please follow the link below.

#### [Scientific Committee](#)

#### ***Equality and Decisions***

One or more reviewer, scientific committee member, or chair, (internal or external), are responsible for evaluating the relevance of the submitted manuscripts to the proceedings, technical and scientific merit, originally, and impact. These evaluations are to be carried out regardless of ethnicity, religion, gender, sexual orientation, political beliefs, and institutions. Successive to peer-review, the Chair has full authority and is solely responsible for the published content and the process thereof.

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#### ***Conflicts of Interest***

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# ETHICS & MALPRACTICE

## Reviewers

### ***Contribution to Decisions***

In order for final decisions to be made regarding acceptance or rejection of papers, we rely on peer-review. Peer-review is the process of experts in the field reading, understanding, and objectively commenting on submitted papers. Through peer-review, scholars give back to the academic and scientific community by helping the chair(s) make decisions regarding manuscripts.

### ***Promptness***

Reviewers should promptly notify the chair(s) if they are unable or unqualified to carry out their reviewing duties. Reviewers should do their best to provide the reviews to the chair(s) as promptly as possible, and within the designated time-frame.

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### ***Thoroughness***

Reviewers should thoroughly read, understand, and provide constructive feedback with the aim of improving the manuscript. Reviewers should aim to identify and report technical issues, irregularities, mistakes, missing citations, and similarity to other published work.

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Invited reviewers should immediately inform the chair(s) in case of a conflict of interest based on competitive, collaborative, personal, family, and other relationships with the authors or people involved in the work.

# ETHICS & MALPRACTICE

## Authors

### ***Authorship***

Only persons who have significantly contributed to the work and the manuscript can be named authors on a paper. These contributions include the idea/concept, design, experiments, evaluation, analysis, drafting or revision of the manuscript, and others. Authors must all have agreed to be named as such and for the manuscript to be submitted. Anyone who has contributed based on the above, but the level of contribution is not significant, may appear in the acknowledgement section of the manuscript.

### ***Accuracy, Originality, and Plagiarism***

Authors should describe their work and the results of their work accurately and in full. The level of provided accuracy and detail should be such that a reader can replicate the work independently. Inaccurate, incomplete, fraudulent, and misleading statements are considered unacceptable and unethical. Direct or indirect use of other people's work is not allowed, unless properly cited. Previous works that have influenced the current work should also be cited. Presenting someone else's work as one's own is strictly prohibited and is considered plagiarism.

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# ETHICS & MALPRACTICE

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Authors must notify the chair(s) at the time of submission, if any factor outside the scope of the research has influenced any step of the work and manuscript writing. Examples of such factors include but are not limited to funding, grants, advisory and consultancy, stock ownership, current or past employment, and memberships, among others. All funding sources should be disclosed in the manuscript.

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Works involving human and/or animal subjects must ensure that the work has abided by institutional guidelines, and pre-approved by required bodies. Moreover, consent must be acquired from participants, and privacy of subjects must be ensured. All of the above must be specified with clear statements in the manuscript.

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Unethical/plagiarism issues mostly result in a retraction, while unintended mistakes will mostly result in the publication of an erratum.

# ETHICS & MALPRACTICE

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### ***Schedule***

This conference proceeding accompanies the conference, meaning a new proceedings will be published every year for the corresponding annual conference of this series.



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