International Symposium of Climatic Effects on Pavement and Geotechnical Infrastructure
## Schedule at a Glance

### August 4th, Sunday
- Ice Breaker Reception, 4:30 -7:30 pm, Akasofu Building, Lobby

### August 5th, Monday
- Breakfast (8:30-9:00 am)
- Welcome Remarks, 9:15 -9:45 am, 501 Akasofu Building
- Keynote Speeches, 9:45 am -12:00 pm, 501 Akasofu Building
- Lunch (12:00-1:00 pm)
- Session 1-1: Climatic Effects - International Perspective (1:15-3:15 pm), 501 Akasofu Building
- Session 1-2: Preservation, Maintenance, and Operations I (3:30-5:00 pm), 501 Akasofu Building

### August 6th, Tuesday
- Breakfast (8:00-8:30 am)
- Session 2-1: Preservation, Maintenance, and Operations II (8:30 -10:15 am), 501 Akasofu Building
- Session 2-2: Infrastructural Materials and Performance I (10:30 am-12:00 pm), 501 Akasofu Building
- Lunch (12:00-1:00 pm)
- Permafrost Tunnel and Trans-Alaska Pipeline System Tour, 1:00 pm-5:00 pm
- Symposium Banquet, 6:30 – 9:00 pm, Pump House Restaurant

### August 7th, Wednesday
- Breakfast (8:00-8:30 am)
- Session 3-1: Infrastructural Materials and Performance II (8:45 -10:15 am), 501 Akasofu Building
- Session 3-2: Analysis and Evaluation Approaches (10:30 am -12:00 pm), 501 Akasofu Building
- Lunch (12:00-1:00 pm)
- Geothermal Renewable Energy Tour, 1:00-5:00pm, Chena Hot Springs Resort

### August 8th, Thursday
- Beaver Slide Field Site Trip, 8:00 am-10:00 pm
Dear Friends and Colleagues:

On behalf of the Organizing Committee, it is my great pleasure to welcome each of you to the International Symposium of Climatic Effects on Pavement and Geotechnical Infrastructure (ISCEPGI) at the University of Alaska Fairbanks, the flagship research campus for the University of Alaska System. We are pleased to have this opportunity to invite researchers and engineers from all over the world to Fairbanks, Alaska. Climate change is affecting transportation infrastructure across the world. We expect this symposium as an international forum to discuss Climatic Effects on Pavement and Geotechnical Infrastructure and a showcase of recent developments and advances in these fields of studies.

We thank all the symposium sponsors for their contributions. We thank you for your active participation.

Welcome again to the International Symposium of Climatic Effects on Pavement and Geotechnical Infrastructure. We hope this symposium will be rewarding and enjoyable for all.

Jenny Liu, Ph.D., P.E., M.ASCE
Chair, Organizing Committee

Symposium Steering Committee

Organizing Committee

- Jenny Liu, Chair (University of Alaska Fairbanks)
- Yiqiu Tan, Co-Chair (Harbin Institute of Technology)

Technical Committee

- Xiong Zhang, Chair (University of Alaska Fairbanks)
- Billy Connor (Alaska University Transportation Center)
- Jie Han (University of Kansas)
- Baoshan Huang (University of Tennessee)
- Tao Liu (Xinjiang institute of Transportation Science)
- Jianming Ling (Tongji University)
- Steve Saboundjian (Alaska Department of Transportation and Public Facilities)
- Aimin Sha (Chang’An University)
- Zhaohui Yang (University of Alaska Anchorage)
- Hannele Zubeck (University of Alaska Anchorage)
**SPECIAL EVENTS**

**August 4th, Sunday**

Ice Breaker Reception, 4:30 -8:00 pm, Akasofu Building, Lobby

This is a great forum to network, mingle with friends and colleagues, and visit our sponsors’ tables.

**August 5th, Monday**

Welcome Remarks, 9:15 -9:45 am, 501 Akasofu Building

Jenny Liu, Chair, Symposium Organizing Committee
Brian Rogers, Chancellor, University of Alaska Fairbanks
Doug Goering, Dean, College of Engineering and Mines
Billy Connor, Director, Alaska University Transportation Center

Keynote Speeches, 9:45 am -12:00 pm, 501 Akasofu Building

Mitigation of Permafrost Impacts on Linear Structures in a Warming Climate, Doug Goering, University of Alaska Fairbanks

How Vulnerable Is Alaska's Transportation to Climate Change? Billy Connor, Alaska University Transportation Center

Seasonal Moisture Influence on Subgrade Performance, Jianmin Ling, Tongji University

**August 6th, Tuesday**

Permafrost Tunnel and Trans-Alaska Pipeline System Tour, 1:00 pm-5:00 pm

Researchers at the U.S. Army's Cold Regions Research and Engineering Laboratory (CRREL) Alaska Research Office maintain and manage the Permafrost Tunnel Research Facility and offer support for scientific research projects. The Permafrost Tunnel is situated near the valley floor of Goldstream Creek, 16 miles north of Fairbanks in Fox, Alaska. The Permafrost Tunnel was excavated from 1963–1969 for the study of permafrost, geology, ice science, and the mining and construction techniques specific to permafrost environments. It offers a unique research platform for scientists and engineers who wish to study a frozen environment over 40,000 years old.

The Trans-Alaska Pipeline System (TAPS) includes the trans-Alaska crude-oil pipeline, 12 pump stations, several hundred miles of feeder pipelines, and the Valdez Marine Terminal. TAPS is one of the world's largest pipeline systems. The crude oil pipeline is privately owned by the Alyeska Pipeline Service Company.

Symposium Banquet, 6:30 – 9:00 pm, Pump House Restaurant

Don’t miss this symposium highlight — another opportunity to meet and reconnect with friends and colleagues from around the world, and enjoy fine dining in an historic atmosphere overlooking the Chena River in Fairbanks, Alaska.

**August 7th, Wednesday**

Geothermal Renewable Energy Tour, 1:00-5:00pm, Chena Hot Springs Resort

This tour will bring you to Chena Hot Springs, the lowest temperature geothermal resource to be used for commercial power production in the world, to learn more about their energy saving projects. You will also have an opportunity to enjoy relaxing hot springs, ice museum, and ‘Chena fresh’ greenhouses, etc.

**August 8th, Thursday**

Beaver Slide Field Site Trip, 8:00 am-10:00 pm

Many roads in Alaska, such as the Dalton Highway, experience degradation during spring thaw due to the downslope running of shallow groundwater. The water flow down the slope and pools up in the road embankments, where it freezes, causing frost boils and subsequent road damage. One good example of this damage occurred at Beaver Slide, near mile 110.5 of the Dalton Highway. This trip will take you to the field site of one research project funded by AUTC and industry on the way up to the arctic circle with information on reliable and economic design of roads in arctic environments. You will also enjoy this Article Circle adventure with remarkable 800-mile long Trans Alaska Pipeline, the Arctic Circle Trading Post situated in the rural community of Joy, the rugged Dalton Highway and the mighty Yukon River at much lower group rate we offer.
August 5th, Monday (8:30 am – 5:00 pm)

Breakfast (8:30-9:00 am)
Welcome Remarks (9:15-9:45 am)
Keynote Speeches (9:45-12:00 pm)
Lunch (12:00-1:00 pm)

Session 1-1: Climatic Effects - International Perspective (1:15-3:15 pm)
Session Chair: Steve Saboundjian, Ph.D., P.E., M.ASCE, Alaska DOT&PF

- Lessons Learned through Development of the Infrastructure and Climate Network (ICNET), Jo Sias Daniel, University of New Hampshire, U.S.A.
- Test and Analysis of Energy Harvesting Oriented Vibration Characteristic of Asphalt Pavement, Hongduo Zhao, Luyao Qing, and Yinghui Liang, Tongji University, China
- Damage Classification and Management Measures of Highway Lifeline of Yunnan Earthquake in China, Benmin Liu, Donglana Su, Zhongyin Guo, Tongji University, China
- Impacts of Winter Temperature Extremes on Asphalt Pavement Temperature Distribution, Dejun Wang, Huining Xu, Yiqiu Tan, Liyan shan, Rui Zhang, Harbin Institute of Technology, China
- Analysis of Road Surface Heat Flux Based on Energy Balance Theory, Xiaoling Zou, Chongqing Jiaotong University, China; Zhiming Tan, Tongji University, China; Danny X. Xiao, Louisiana Transportation Research Center, U.S.A

Coffee Break (3:15-3:30 pm)

Session 1-2: Preservation, Maintenance, and Operations I (3:30-5:00 pm)
Session Chair: Bob McHattie, P.E., GZR

- Sustainable Curing and Inspection Practices for Concrete Paving, Dan Zollinger, Texas A&M University, U.S.A
- A Field Study of Sealing Thermal Cracks in Alaska’s Asphalt Concrete Pavements, Antony Mullin, University of Alaska Fairbanks, U.S.A; Bob McHattie, GZR, U.S.A; Jenny Liu, University of Alaska Fairbanks, U.S.A
- Enabling Sustainability in Highway Winter Maintenance Operations: Seven Best Practices and a Look to the Future, Xianming Shi, Jiang Huang, Ning Xie, Montana State University, U.S.A.
- Field Monitoring Performance of H2Ri at the Beaver Slide Test Section, Xiong Zhang, University of Alaska Fairbanks, U.S.A

August 6th, Tuesday (8:00 am-12:00 pm)

Breakfast (8:00-8:30 am)

Session 2-1: Preservation, Maintenance, and Operations II (8:30 -10:15 am)
Session Chair: Prof. Baoshan Huang, Ph.D., P.E., M.ASCE, University of Tennessee

- Evaluation of Pavement Preservation Treatments Used in Alaska, Antony Mullin, Jenny Liu, University of Alaska Fairbanks, U.S.A; Hannele Zubeck, University of Alaska Anchorage, U.S.A.
- Gravel Runway Surface Maintenance and Environmental Impact, David Justus, Midwest Industrial Supply, Inc. U.S.A.
- Understanding the Effects of Chloride Deicer Exposure on Concrete Bridge Decks: Some New Insights, Xianming Shi, Montana State University, U.S.A.
- Measuring Fatigue Damage from an Instrumented Pavement Section due to Day-Night and Yearly Temperature Rise and Fall in Desert Land of the West, Rafiqul A. Tarefder, Md Rashadul Islam, University of New Mexico, U.S.A.

Coffee Break (10:15-10.30 am)
### Technical Program (all held at 501 Akasofu Building)

#### Session 2-2: Infrastructural Materials and Performance I (10:30 am-12:00 pm)
**Session Chair:** Prof. Zhaohui Yang, Ph.D., P.E., M.ASCE, University of Alaska Anchorage

- Shake Table Modeling of Laterally Loaded Piles in Liquefiable Soils with a Frozen Crust Xiaoyu Zhang, **Zhaohui Yang**, Runlin Yang, University of Alaska Anchorage, U.S.A
- Climatic Parameter TMI in Subgrade Soils, Er Yue, Lizhou Chen, **Rifat Bulut**, Qi Cheng, *Oklahoma State University, U.S.A*
- Pavement Performance of Superflex Modified Asphalt Mixture’s on Thin Overlay, Xudong Hu, **Qisen Zhang**, Wei Chen, Yan Sun, Liangyun Tao, *Changsha University of Science and Technology, China*

#### August 7th, Wednesday (8:00 am-12:00 pm)

**Breakfast (8:00-8:30 am)

**Session 3-1: Infrastructural Materials and Performance II (8:45 -10:15am)
**
**Session Chair:** Prof. Yiqiu Tan, Ph.D., Harbin Institute of Technology

- Performance of Paving Fabric Reinforced Asphalt Mixture, **Peng Li** and Jenny Liu, *University of Alaska Fairbanks, Mike Samueloff and David Jones, Tencate Geosynthetics & Industrial Fabrics, U.S.A*
- Physico-Chemical Characteristics of Oil-sand Asphalts, Namjun Cho, **Namho Kim**, Suil Song, Neiri Nader, *Korea University of Technology and Education, Korea*
- Using Statistical Method and Viscoelasticity to Control Low Temperature Performance of Asphalt Mixtures during Construction, **Chun-Hisng Ho**, *Northern Arizona University, U.S.A*
- Field and Lab Evaluation of Winter Pothole Patching Materials, **Baoshan Huang**, *University of Tennessee, U.S.A.*

**Coffee Break (10:15-10:30 am)

**Session 3-2: Analysis and Evaluation Approaches (10:30 am -12:00pm)
**
**Session Chair:** Prof. Chun-Hisng Ho, Ph.D., Northern Arizona University

- Using Two-Parameter Weibull Distribution Model to Predict Damage Degree of Hot Mix Asphalt Included Freeze-Thaw Cycles **Zejiao Dong**, Xiangbing Gong, Yiqiu Tan, *Harbin Institute of Technology, China*
- A Photogrammetric Method to Evaluate the Erosiveness of Fairbanks Silt with Different Treatments, **Lin Li**, *University of Alaska Fairbanks, U.S.A*; Rodney Collins, *University of Oklahoma, U.S.A*; Xiong Zhang, *University of Alaska Fairbanks, U.S.A*; Huayi Wei, *Xiangtan University, China*
Campus Map

Due to the summer construction, part of Tanana Loop is closed. Please use the red routes (Thompson Dr. or Tanana Loop E → roundabout → Tanana Loop W → N Koyukuk Dr) on the map to Akasofu building (also named IARC, International Arctic Research Center). During the symposium period, there will be signs on the side of the road directing you to the Akasofu building.

Parking

After 5 pm on weekdays and all day on weekends, parking is free in all lots on campus (except Handicapped and Reserved spaces). On weekdays during the day, daily parking permit can be purchased at any Parking Permit Kiosk (as show in the map). There is one at the back of Akasofu Building. Metered visitor parking spaces are available in front of the building as well. No parking pass is needed on August 4 (Sunday).

Weather

The typical summer temperature in Fairbanks is 15-25°C (59-77 °F). The temperature at Arctic Circle is much cooler (2-20°C or 35-68 °F). Please prepare to wear in layers. Rain gears are recommended.