

16  
2017

NOON TALK @ DIATI

**MERCOLEDÌ 5 LUGLIO 2017  
ore 13.00**

Politecnico di Torino  
Sala Riunioni 1° Piano  
DIATI - ingresso 3



**POLITECNICO  
DI TORINO**

Dipartimento di Ingegneria  
dell'Ambiente, del Territorio  
e delle Infrastrutture

## **“RESILIENT AND SUSTAINABLE PAVEMENTS THROUGH MESOSCALE MODELING OF ASPHAL CONCRETE”**

moderated by Dr. **Pier Paolo Riviera** (DIATI)

### **B. Shane Underwood**

Assistant Professor in the School of Sustainable Engineering and the Built Environment in the Ira A. Fulton Schools of Engineering at Arizona State University (ASU)



#### **ABSTRACT**

The need for improved infrastructure is well documented as are the historical and emerging factors and uncertainties that present barriers to meeting this need. In the future, pavement infrastructure will need to be flexible and readily adaptable to these uncertainties to remain sustainable. There are many areas in this topic, and in this seminar the focus will be on three aspects that are being studied in the Advanced Pavements Laboratory group at Arizona State University. The talk will begin with an overview of the overall approach being taken within the framework of a multiple length and time-scale domain. Then two different examples of top-down investigations, impact of autonomous vehicles and effects of climate change on pavements, will be presented. These topics will set the stage for the second part of the talk, which will focus on bottom-up and middle-out mechanistic modeling studies involving mortar, mastics, and bitumen. This modeling effort will focus largely on work completed using continuum damage principles that describe the fatigue characteristics across length scales and the application of a multivariate probabilistic assessment to understand reliability with this damage model. Discussions on these topics and their application to the investigation of sustainable and resilient pavements will follow the talk.

#### **BIOGRAPHY**

Dr. Shane Underwood is an Assistant Professor in the School of Sustainable Engineering and the Built Environment in the Ira A. Fulton Schools of Engineering at Arizona State University (ASU). Prior to joining ASU he was a Graduate Research Assistant and then Research Scientist at North Carolina State University where he received his doctorate degree in Civil Engineering with a focus on the multiscale characterization and modeling of asphalt concrete. His research and teaching focuses on pavements and asphalt material modeling using experimental mechanical techniques and then applying these methods to broadly study topics of resilience and sustainability in transportation infrastructure. He is an active member at the Transportation Research Board and the American Society of Civil Engineers where he participates in the Characteristics of Asphalt Paving Mixtures to Meet Structural Requirements committee and Engineering Mechanics Institute's Pavement Mechanics committee respectively. His work has been published in more than 54 peer reviewed journal papers including Construction and Building Materials, International Journal of Fatigue, Mechanics of Materials, ASCE Journal of Engineering Mechanics, the Transportation Research Record, and others.

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Please bring  
your own mug.  
Coffee and tea  
will be  
provided  
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Save the date for our next speaker-event, on September 13, at 13.00