



## Spring Dinner Meeting

*The Carolinas Chapter of the  
Association of Environmental & Engineering Geologists  
Presents Guest Speaker:*



**Dr. John Kemeny**  
2024-2025 Jahns Distinguished Lecturer  
Professor Emeritus, University of Arizona

Our chapter has invited the Jahns Lecturer to speak at a chapter meeting annually since 2007. We welcome the current Jahns Lecturer, Dr. John Kemeny, as speaker at our spring chapter meeting in Raleigh. During the week of his April visit, Dr. Kemeny will also present at NC State University, UNC-Chapel Hill and -Wilmington, East Carolina University, and Wake Tech.

### **Dr. Kemeny's Presentation:**

**INNOVATIVE MONITORING AND CHARACTERIZATION TECHNOLOGIES  
(With The Help Of AI) FOR COMBATting GEOLOGIC/HYDROGEOLOGIC  
HAZARDS ASSOCIATED WITH CLIMATE CHANGE**

## Meeting Details

- Place:** The “Press Box” at Tobacco Road Sports Café & Brewery, 505 W. Jones Street, Raleigh
- Date:** Thursday, April 10, 2025
- Time:** 5:30 PM socializing begins, 7:00 buffet dinner, 8:00 Jahns Lecturer’s presentation
- Cost:** AEG and ASCE members \$35; non-members \$50; public-sector employees and teachers \$20. **Students free w/ college ID. *Registration will be \$5 more at the door.***
- Reservations:** Please make reservations and prepay by 6:00 PM on Monday, March 24, 2025 at <http://aegcarolinas.org/news/>.
- Students** - register by emailing Colleen Ranieri ([colleen.ranieri@nv5.com](mailto:colleen.ranieri@nv5.com)) and Meredith Ambrose ([mparnold11@gmail.com](mailto:mparnold11@gmail.com)) by March 24, 2025.
- Continuing Education:** The NCBLG has preapproved AEG Carolinas to offer 1 CE credit.

## Dr. Kemeny’s Abstract

Monitoring and characterization of natural and manmade geologic environments are important aspects of applied geology, and can include monitoring water flow or rock movement, or characterizing the condition of a rock slope or debris flow path. I am currently involved with utilizing neural networks to develop some new monitoring and characterization strategies to help combat the increasing geologic and hydrologic hazards associated with climate change. This is particularly needed in countries worldwide, where utilizing technologies developed for the mining/petroleum/civil industries is often cost prohibitive. The lightbulb moment for me was listening to a podcast in 2021 given by Pete Warden, who was then the head of Google Brain, a deep learning artificial intelligence research division at Google. He spoke about TinyML, which is the concept of embedding sophisticated neural net routines on very small microcontrollers that are highly energy efficient and can form the basis for field sensors that not only collect data but also analyze, classify, and communicate the results (flood warning for example). The Jahns talk will cover the kinds of AI used in TinyML, the potential applications of TinyML to monitor and characterize geologic and hydrologic hazards, and hands-on examples of how easy it is to train a neural net routine and embed it on a small microcontroller. An example we are currently developing is a small sensor that only utilizes sound to characterize water flow in a stream or urban environment, with installations as simple as hanging the sensor from a tree or light pole.

## Dr. Kemeny’s Biography

Dr. John Kemeny has over 40 years of experience in the applied geoscience fields through a career that has included working at a geomechanics consulting company, post-doc at the Lawrence Berkeley National Lab, 33 years as Professor at the University of Arizona, and co-founder of a successful startup company that became a world leader in vision-based rock fragmentation measurement software and point-cloud based rock mass characterization software. He earned BS degrees in geology and math from the University of California Santa Barbara in 1977, ME and PhD degrees focusing on rock mechanics from the University of California Berkeley in 1982 and 1986. He began his career in the Department of Mining and Geological Engineering at the University of Arizona in 1989, retiring as Emeritus Professor in 2022. At the University of Arizona Dr. Kemeny published over 170 papers, gave over 80 invited technical talks and workshops, and graduated 15 PhD and over 50 masters students, with research and teaching focused on rock mechanics, slope stability, rock fracture mechanics, numerical simulation in rock mechanics, and developing 3D imaging and sensing technologies for geotechnical applications. In 1998 he co-founded Split Engineering with three students, a spinoff company focused on new technologies for measuring rock fragmentation and point cloud processing software for slope and underground stability. The company had offices in the US, Chile, Peru, South Africa and Australia and was acquired by Hexagon Mining in 2019. Since retiring from the University of Arizona, Dr. Kemeny has recently started another company involved with integrating AI into the applied geology fields, to help combat the increasing hazards due to climate change.