The Geo-Institute Geoenvironmental Engineering Technical Committee will live-stream the *session* ***"Sustainable Innovations for Geoenvironmental Engineering"*** on Thursday, December 11, at 11 AM EST. The talks include:

Talk #1: *"Beneficial Use of Off-Specification and High Organic Content Fly Ashes:"*, presented by Susan E. Burns, Ph.D., P.E., F.ASCE)

This lecture will explore the engineering behavior of weathered deposits of fly ash produced through combustion of coal for power generation. Historically, excess fly ash generated in the United States was dry disposed on land or sluiced into ponds for solid/liquid separation, while freshly generated ash was sold for application in concrete; however, recent seasonal shortages in the fly ash market have generated interest in reclamation and beneficial use of high organic content and ponded ash as a supplementary cementitious material. Understanding the behavior of these materials is critical in engineering applications because exposure to water during disposal/long-term storage alters the morphology and geochemistry of the ponded ash, which in turn impacts its engineering behavior. Trends in the chemical, morphological, and mechanical properties of fly ash will be analyzed as a function of storage conditions, along with recommendations for beneficial use applications in the field, such as construction materials.

Talk #2: *Impact of bacterial motility on the viscosity of bacterial suspensions* (Presented by Boyoung Jeong, Ph.D., A.M.ASCE)

Fluid and interfacial properties, including viscosity, displacements within porous media. Bacteria suspended in fluids communicate extensively with the surrounding environment, and their hydrodynamic interactions within suspension fluids contribute to alterations in the flow field, and consequently, the viscosity. This talk explores the effect of bacterial motility on the non-Newtonian attributes that define the rheological behavior of bacterial suspensions. The rheological properties of bacterial suspensions were studied through an experimental approach using three Escherichia coli (E. coli) strains. Each strain possesses unique shape and motion characteristics: a motile E. coli with rotating flagella, a non-motile E. coli mutant with paralyzed flagella, and another non-motile E. coli mutant completely devoid of flagella. This presentation will enhance the understanding of active suspension rheology and elaborate on the potential application of bacterial suspensions in the management of multiphase flow.

Talk #3: *Exposed Geomembrane Liner for Final Cover Systems* (Presented by Ricardo de Abreu, Ph.D., P.E., M.ASCE)

Federal standards in the United States require that owners or operators to install final cover systems for Municipal Solid Waste (MSW) landfills to minimize infiltration of liquids and soil erosion. The permeability of the final cover must be less than the underlying liner system, but no greater than 1.0 x 10-5 cm/sec. Alternative design for landfill final covers, including the utilization of exposed geomembranes, is considered by some regulatory authorities if the alternative cover is capable of providing equivalent or superior performance when compared to the traditional cover. Exposed geomembranes have been used as landfill cover in several sites throughout the United States, and as final cover, offer several advantages when compared to traditional covers, including easier installation, less maintenance, airspace maximization, and overall cost savings. Since exposed geomembranes require little maintenance compared to soil covers, they may be especially beneficial for facilities that only have access to low pH, highly erodible soils. This presentation will cover the basic principles of utilizing geomembranes as final cover systems. It will also present a real-world case study of a landfill in Louisiana where an exposed geomembrane was installed as final cover system, the design considerations, and the challenges associated with their installation.