

# Microbial Dark Matter in a Changing Environment



## Science & Mathematics Colloquium Series

### Presentation by Ryan Penton

Assistant Professor, Faculty of Science and Mathematics  
ASU College of Integrative Sciences and Arts  
Julie Ann Wrigley Global Institute of Sustainability  
Center for Fundamental & Applied Microbiomics

**Wed., Nov. 16, 3 pm**  
**Santa Catalina Hall, Room 130**  
**ASU Polytechnic campus**

The soil microbiome, composed of bacterial and fungal communities, is the most complex and diverse environment on Earth. Harboring more biomass than all other living things on the planet, its impact on the global environment is easily underestimated. Microbial ecology is the study of these interactions, with the ultimate goal of linking ecosystem-level processes with microbial dynamics.

Penton will discuss research results focused primarily on agricultural sustainability, from a microbial perspective. The work uses emerging analysis methods to answer questions about the sensitivity, resistance and resilience of the microbial community to environmental stress.

**C. Ryan Penton** studies the relationship between microbial community composition and function and ecosystem-level processes in relation to global climate change and other environmental disturbances in soil, aquifer and permafrost systems. He also focuses on the natural suppression of various crop diseases by soil fungal and bacterial communities and the impact of agricultural management practices on soil microbial-mediated nutrient cycling and crop production.



Dr. Penton couples next-generation sequencing and quantitative platforms with biogeochemistry to analyze microbial responses not only at the compositional and functional scale, but through random matrix theory-based analytics. This allows for novel insights into the sensitivity and resilience of microbial communities to external stressors and predictions into ecosystem stability.

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*Faculty and practitioners discuss their current research and field projects in the college's Science and Mathematics Colloquium Series, held throughout the academic year at the ASU Polytechnic campus. All seminars are free and open to the public.*