**Losing Gracefully:  Developing Anti-biofouling Strategies for Environments Where Nature Always Wins**

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**Abstract:**

Biofouling, the unwanted accumulation of organic matter and cells on a surface, is a considerable challenge to many industries. A mere 250 µm of slime can reduce heat transfer by a heat exchanger by 50% and a biofilm-induced surface roughness of 50 µm can increase drag on ship hulls by up to 22%. Biofouling is a leading cause of aquatic invasive species introduction and biofilms are associated with over 80% of all infections. The fundamental mechanisms of fouling accumulation, and the means of combatting it fall at the intersection of biology, chemistry, and physics. Using marine and hydrokinetic power systems (e.g., wave energy converters and tidal turbines) as a case study, this talk will provide an introduction to the biofouling process, its consequences, and the challenges of developing economically and environmentally viable coatings and materials to limit the harmful effects of biofouling. Emphasis will be placed upon current efforts to integrate composite materials and coatings in construction and the development of new methods for rapid and quantitative measurement of fouling.

**Biography:**

Dr. George Bonheyois a Senior Research Scientist in the National Security Directorate at Pacific Northwest National Laboratory in Richland, Washington. He also has a joint appointment as a Research Professor of Bioengineering in the Gene and Linda Voiland School of Chemical Engineering and Bioengineering at Washington State University in Pullman, WA. He received his Ph.D. in microbiology from the University of Illinois at Urbana-Champaign, studied geomicrobiology and polymicrobial diseases as a National Science Foundation Postdoctoral Research Fellow, and was the cofounder and CEO of GeoBiologics, Inc., which provided novel products and services for microbial detection, identification, and enumeration.  Dr. Bonheyo transferred his stake in the company in 2005 and joined the Pacific Northwest National Laboratory to develop the biotechnology program at PNNL’s Marine Science Laboratory in Sequim, WA. As a PI and project manager at PNNL, his programs span fundamental through applied research in biosecurity, the use of synthetic biology to create living sensors and control systems, biofilms and biofouling/biocorrosion, bioremediation, cybersecurity, and the transport, fate, and detection of chemical and biological signatures. As an active mentor for junior scientists, he has developed workshops and training material on writing white papers and proposals, business development, creating elevator pitches, and delivering presentations.

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