

“High value sensors in the era of Industrial Internet: Innovations in materials, transducers, and data analytics”

Dr. Radislav A. Potyrailo

Principal Scientist

GE Global Research Center, Niskayuna, NY, USA

Abstract:

Modern monitoring scenarios of gases and liquids for industrial safety and productivity, medical diagnostics, environmental surveillance, and other Industrial Internet applications demand new sensing capabilities of better accuracy, lower power consumption, and unobtrusive form factors. This talk will provide a critical overview of developments of a new generation of physical, chemical, and biological sensors based on the multivariable response principles to meet these new demanding sensing requirements. Multivariable sensors provide several partially or fully independent responses from an individual device to allow quantitation of several individual components in mixtures, rejection of interferences, and correction for environmental instabilities. Such multivariable sensors have been developed for monitoring of industrial reactions, detection of contaminants in industrial fluids, and detection of trace levels of toxic gases. We will discuss the design criteria of these sensors and the key roles of sensing materials, transducers, and data analytics to achieve desired sensor performance. These developed multivariable sensors are attractive when selectivity advantages of classic off-line analytical instruments are cancelled by requirements for no consumables, low power, low cost, and unobtrusive form factors. We will conclude with a perspective for future needs in fundamental and applied aspects of gas and liquid sensing and with the 2025 roadmaps for ubiquitous gas- and bio-monitoring.

Biography:

Dr. Radislav Potyrailo is a Principal Scientist at GE Global Research in Niskayuna, New York, leading the growth of wireless, wearable, and harsh environment sensing technologies for GE applications. He holds Optoelectronics degree from Kiev Polytechnic Institute and PhD in Analytical Chemistry from Indiana University. He has developed sensing technologies for GE Healthcare, Water, Security, Corporate Environmental, Consumer & Industrial, Energy, Transportation, and other GE businesses. Radislav has been serving as a Project Leader on numerous GE programs and as a Principal Investigator on US Government programs funded by NIH, AFRL, DARPA, TSWG, DHS, NIOSH, and NETL. Radislav has 100+ granted US Patents and 150+ publications, coauthored/coedited eight books, and serves as an editor of the Springer book series Integrated Analytical Systems. He is Senior Member of IEEE and Fellow of SPIE.