Abstract: Accurately designed, placed, and integrated instrumentation can significantly enhance situational awareness, favorably change installation costs, increase productivity, and reduce total cost of ownership for Smarter Grid customers and applications. Photonic and wireless technologies are poised to become a critical part of the solution for Smarter Grid systems.

Instrumentation for the grid has evolved over the years from mechanical, electromechanical, electro-static, digital, are now successfully transitioning into wireless, and are poised to leverage advances in telecom photonics. The “bust” of the telecom bubble has resulted in a plethora of technology and technologists that are leveraging these advances to address such lower volume, high value add instrumentation for industrial/utility applications.

This talk will provide examples on how key challenges in wireless and photonics technologies are being addressed. Wireless challenges include; spectrum availability, RF noise, multipath, channel fading, scattering, free space and indoor path loss, frequency penetration, power issues, security, scalability, performance/latency, configuration, regulations, customer acceptance, and success/failure of standards.

The understanding of challenges related to the application of photonics in the industrial/utility application space are not as well defined as those in wireless, due to the comparative relative immaturity of the technical readiness level (TRL) as it relates to demonstrated beneficial applications. This talk will present some of the leading applications of industrial photonics, an assessment of the immediate challenges, as well as those longer term ones which that remain to be addressed.

The talk will conclude with insights on GE’s research agenda on potential paths to leverage these technologies to address customer needs, drive resultant revenue growth, as well as articulate areas of collaboration and external contribution.

Biosketch: John Garrity is the manager of the RF& Photonics (RF&P) laboratory, which is part of the Electronic Systems & Controls Global Technology Organization at GE Global Research in Niskayuna, NY. In this role John is leading a team of 20 Scientists and Engineers to invent and develop new technology for General Electric business units. GE customers include Healthcare, Energy, Oil & Gas, Digital Energy, Security, and Sensing. External customers include Lockheed Martin, DARPA, DoE, and DoD. John has an interest/focus on instrumentation and communication (wired & wireless), photonic sensing, RF instrumentation, developing and leading a cross functional team, and developing and driving business models for technology commercialization.

John has been with GE since 1992, and his most recent professional experience is leading the integration of GE Microwave Data Systems (MDS), an industry leader in industrial, wireless communications systems. His prior GE experience includes engineering and engineering management for industrial energy management systems as well as strategic sales and marketing for GE Digital Energy, GE Fanuc, and GE C&I.