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# What next for reliable body sensor networking? Addressing the challenges faced by wireless communication systems in close proximity to the human body

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**Abstract:** The topical interest in wireless devices, sensors and systems operating in close proximity to and in conjunction with the user's body continues to grow unabated. This presentation show how the unique, and often challenging, characteristics at the physical layer can be used to our advantage in developing new ideas and applications for wireless body sensor networking. This physical layer starting point can both inform, and can be exploited by, all layers of the stack to deliver optimum communications performance even under tight resource constraints. It is clear that further research on antennas and propagation, wireless communication protocols and even localisation and interference sensing and mitigation will be needed to ensure that future generations of body sensor networks will be reliable and robust. Nonetheless, the presentation will examine how the physical layer remains at the heart of efforts to improve wearable applications, for example, by optimising the use of the available spectrum and improving energy efficiency in both devices and systems.

**Biography:** William G. Scanlon received the B.Eng. degree in electrical engineering (first-class honours) by part-time study and the Ph.D. degree in electronics (specializing in wearable and implanted antennas) from the University of Ulster, UK in 1994 and 1997, respectively. He was appointed as Lecturer at the University of Ulster in 1998, Senior Lecturer and Full Professor at Queen's University of Belfast (UK) in 2002 and 2008, respectively. As Director of Research for Wireless Communication Systems (WCS) he is responsible for 9 faculty members and over 30 doctoral students and researchers at Queen's and he also held a part-time Chair in Short Range Radio at the University of Twente, The Netherlands from 2009 to 2014. Prior to starting his academic career he had 10 years of industrial experience, having worked as a Senior RF Engineer for Nortel Networks, as a Project Engineer with Siemens and as a Lighting Engineer with GEC-Osram. His current research interests include personal and body-centric communications, wearable antennas, RF and microwave propagation, channel modelling and characterization, wireless networking and protocols and wireless networked control systems. He has published over 200 technical papers in major IEEE/IET journals and in refereed international conferences (H Index = 25). He served as keynote speaker for the NATO Military Communications and Information Systems Conf. (2010), the Intl. Conf. on Bodynets (2010) and the European Workshop on Conformal Antennas (2007). He Co-Chaired the International Workshop on Advances in Wireless Physical Layer Communications for Emerging Healthcare Applications at MobiHealth 2012 and the 2009 Loughborough Antennas and Propagation Conference and he has acted as invited speaker and session chair at numerous other international conferences. He has been a Series Editor of the IET Book Series on Telecommunications and Networking and he delivered the 2012 NATO Lecture Series on Next Generation Communications. Prof. Scanlon received a Young Scientist award from URSI in 1999, and he was a recipient of the 2010 IEEE H. A. Wheeler Prize Paper Award. He is Associate Editor for IEEE Antennas and Wireless Propagation Letters and the IEEE Journal of Translational Engineering in Health and Medicine and he is also a prolific reviewer for IEEE/IET journals and major conferences. He was a founding Director of WirelessLAB (Ireland) and is a member of the IEEE International Committee on Electromagnetic Safety (ICES). He is Managing Director and co-founder of Queen's spin-out ActivWireless Ltd.