Lars Samuelson received his PhD in physics in 1977 in the field of experimental and theoretical studies of electron-phonon coupling for deep levels in semiconductors, followed by a post-doc at IBM San José Research Centre in California, there active in the fields of display technology and band structure calculations. In 1981 he became associate professor of physics at Lund University and in 1986 professor of semiconductor physics at Chalmers/University of Gothenburg. In 1988, he returned to a professorship in semiconductor electronics at the Department of Physics at Lund University, when he initiated the interdisciplinary research center Nanometer Structure Consortium, later called NanoLund, which today engages more than 300 researchers. Since 2021, he is employed as Chair Professor at the Southern University of Science and Technology (SUSTech), in Shenzhen, China, and as the leader of the Institute of Nanoscience and Applications (INA).

In 2004 he became a Fellow at the Institute of Physics, UK (FinstP), at the American Physical Society (APS, Materials Physics) in 2009 and in 2020 he became a Fellow International at the Japanese Society for Applied Physics (JSAP). He became a member of the Royal Physiographic Society in 1998, of KVA, the Royal Swedish Academy of Sciences (Physics Class) in 2006 and of IVA, the Royal Swedish Academy of Engineering Sciences in 2007. In 2008, he was named "Einstein Professor" by the Chinese Academy of Sciences. In 2013, he was awarded the IUVSTA Prize for Science for Triennium 2010-2013 and in 2014 the Fred Kavli Distinguished Lectureship in Nanoscience. In 2018, he was awarded the Wilhelm Westrup Prize for basic materials science leading to the creation of commercial value. In 2022 Lars Samuelson was awarded the highest engineering science prize from IVA, the Royal Swedish Academy of Engineering Sciences, the Great Gold Medal, "for his internationally outstanding contributions as a pioneering researcher and research leader in nanoscience and nanotechnology and for the exploitation of scientific results, particularly in the field of semiconductor technology" and "for his outstanding contributions to the field of nanomaterials". In 2023 Lars Samuelson was elected "Foreign Member of the Chinese Academy of Sciences, CAS".

Lars Samuelson is the founder and chief scientist of four start-ups working on the commercialization of nanowire and nanomaterial technologies, in QuNano AB, GLO AB, Sol Voltaics AB and Hexagem AB. Samuelson is the author of well over 700 articles with h-index 90 at Web-of-Science (h-index 108 according to Google Scholar), and listed among the 1% most highly cited researchers by Web-of-Science, and has given >300 plenary/invited talks at international conferences.