

Master Lectures on Photonics Integration

Optical Beams – the next Breakthrough in Broadband Wireless Communication

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Abstract: The fast-growing demand for wireless delivery of broadband services is exhausting the capabilities of radio-based communication technologies. Like in wired connections, also in wireless connectivity there is a huge yet largely unexploited potential in optical communication technologies. By means of carefully steered narrow infrared beams, high capacity individual links to users at high user densities can be created. A concise overview will be given of the key technologies for the beam steering, user localization and beam reception, as well as of the architecture of indoor broadband optical wireless systems and experimental testbed results. The applications will be discussed, and the capabilities compared with those of radio-based wireless indoor systems. Finally, an outlook on further progress is given.



Biography: Ton Koonen worked from 1979 until 2000 in applied research, at Philips' Telecommunication Industry, and latest at Bell Laboratories, Lucent Technologies. From 1993 to 2000 he also was a part-time professor at University of Twente. From 2001 to Feb. 2021, Ton was full-time professor in Broadband Communication Systems (in particular optical communication systems) at Eindhoven Univ. of Technology. He served as chairman of the group Electro-Optical Communication Systems, and as vice-dean for research of the department Electrical Engineering.

Ton is a Bell Labs Fellow (the first in Europe), IEEE Fellow, OPTICA (formerly OSA) Fellow, and was appointed 'Ridder in de Orde van de Nederlandse Leeuw' in 2021. He received an Advanced Investigator Grant in 2012, the most prestigious personal grant of the European Research Council, for research on optical wireless communication techniques.

Ton (co-)authored more than 750 journal and conference papers, and filed 13 patents. His research interests include optical fiber communication networks, fiber-to-the-home, indoor networks, spatial division multiplexing, radio-over-fiber techniques, and most recently optical wireless communication.