

Marcel leads a research program on manufacturing at the small length-scale. His interests include micro-assembly, photonic alignment, self-assembly of discrete components and nanomaterials, and nanoparticle patterning. Among key results are micro-fabricated structures and MEMS functions to achieve high precision alignment in integrated photonic systems, and magnetic-driven self-alignment of ultra-thin chips for flexible electronic packages. Currently, he focuses on volume scale-up of manufacturing for 3D, nano-enabled materials and devices, with key applications in micro-mechanical and multi-physics metamaterials and nanoparticle-based functionalities.

Marcel has been active in setting up collaborative research programs, both within the university (e.g. Delft Centre of Mechatronics and Microsystems, DCMM, 2003-2010) and with industrial stakeholders, amongst others as part of the Nano Engineering Research Initiative (NERI) which he led to establish. He is currently the scientific leader of a large collaborative research program with Nexperia-ITEC on new processes for massive chip assembly (2021 and onward). He was a Research Fellow, funded by an EU Marie Curie IEF grant, in the Optical and Semiconductor Devices Group, Imperial College, London, in 2011, to investigate volume methods for nano-particle patterning.