The revolution of nanotechnology is already around us. As an example, the information technologies (IT), which are already reshaping our world, are possible due to an accumulative knowledge in which nanotechnology is crucial. One of these technologies is Molecular Beam Epitaxy (MBE) which was developed on the late 60’s and that still stands as a fundamental nanotool. At the Instituto de Microelectronica de Madrid we take advantage of the exciting possibilities of nanotechnology and nanoscience applied to the fields of IT, energy harvesting and health. I will show, for example, how a deep understanding of MBE growth processes enables the fabrication of self-assembled III-V nanostructures such as quantum rings, quantum dots, and quantum wires that can be on-will tuned to cover a wide range of the spectrum from 0.98 mm to 1.6 μm.

Another example is the possibility of nano-engineer thermoelectric materials that enables the fabrication of high performance devices and systems where quantum size effects provide additional ways to enhance energy conversion efficiencies in nanostructured materials. Another exciting field in which nanotechnology is allowing new possibilities is biological functionalization of nanomechanical systems and design of novel approaches for cancer sensing with unprecedented sensibility.

Biography:
Dr. Garcia has received his PhD in Physics in 1995 from Universidad Autónoma de Madrid. He did his Post-Doc at the University of California, Santa Barbara, USA. In 1998 he joined Instituto de Microelectronica de Madrid (IMM), CSIC. He also worked from 2007-2008 at Bell Labs (USA) and from 2009-2012 at Columbia University (USA). His work focuses on fabrication by Molecular Beam Epitaxy of self-assembled nanostructures and graphene and their electronic and optical properties. He is co-author of >160 publications and 3 patents with >5840 citations. H factor 40. Presently is Director of the IMM.