

Symposium II. Silicon Materials Manufacturing



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Carlo Cavallotti received his phd in Chemical Engineering in 1999 from Politecnico di Milano. He became assistant professor at Politecnico di Milano in 1999 and associate professor of Chemical Engineering Principles in 2006. In 2001 he was post doctoral associate fellow at MIT. Winner of several awards, he is author of more than 70 papers on international peer reviewed journals and several book chapters. His main research focus is theoretical chemical kinetics. In particular he is interested in the gas phase and surface chemistry active during the growth of advanced materials, in the kinetics active in plasmas and in combustion environments and, more recently, in the molecular modeling of biomolecular reacting systems. The method adopted to investigate these different systems is similar and is based on the multiscale modeling paradigm. From this standpoint the study of advanced material synthesis is pursued by investigating elementary reactions through quantum chemistry, the film morphological evolution using 3 D kinetic Monte Carlo methods, and the reactor fluid dynamics by integrating the equations of conservation of mass, energy, and momentum together with the Maxwell equations (in the plasma case) using the finite element method (home built code). The investigated systems comprise epitaxial and nanocrystalline silicon, the MOCVD deposition of III-V (InP, GaAs and AlGaAs) and II-VI (ZnS, CdTe, ZnSe) materials, and the deposition of Cu for microelectronic applications.