

## PhD Programme in Information and Communication Technologies (ICT) Short course on

# “Semiclassical and quantum mechanical foundations of modern nanoscale FET device operation”

**Abstract:** Based on a succinct and highly focused review of a few key concepts of quantum mechanics, the course will introduce the foundations of the semi-classical approach to nanoscale electron device modeling. Selected elements of quantum mechanics are merged with classical electrostatics and transport theory to yield a state-of-the-art description of advanced nanoscale FETs. Conventional, strained and alternative channel materials, quasi-ballistic transport in a 2D or 1D electron gas as achieved in FinFET, double gate FDSOI, nanowire, nanosheet and nanofork gate all around device architectures will be addressed.

### When and Where:

Wednesday June 22, from 9.30 to 11.30, room P1.6, Building MO25

Thursday June 23, from 9.30 to 11.30, room P1.6, Building MO25

Monday June 27, from 9.30 to 11.30, room P1.5, Building MO25

Wednesday June 28, from 9.30 to 11.30, room P1.5, Building MO25

Wednesday June 29, from 9.30 to 11.30, room P1.5, Building MO25

Wednesday June 30, from 9.30 to 11.30, room P1.4, Building MO25

**Abstract:** Based on a succinct and highly focused review of a few key concepts of quantum mechanics, the course will introduce the foundations of the semi-classical approach to nanoscale electron device modeling. Selected elements of quantum mechanics are merged with classical electrostatics and transport theory to yield a state-of-the-art description of advanced nanoscale FETs. Conventional, strained and alternative channel materials, quasi-ballistic transport in a 2D or 1D electron gas, FinFET, double gate FDSOI, nanowire, nanosheet and nanofork gate all around device architectures will be addressed.

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