# COLLOQUIA DFA A.A. 2023-2024

Università degli Studi di Padova

Dipartimento di Fisica e Astronomia Galileo Galilei

# COLLOQUIUM DFA

IN PRESENCE AULA ROSTAGNI
YOUTUBE STREAMING

## OCTOBER 19TH 2023 - 3 PM

## Group IV semiconductor heterostructures: photonics, spintronics and quantum applications


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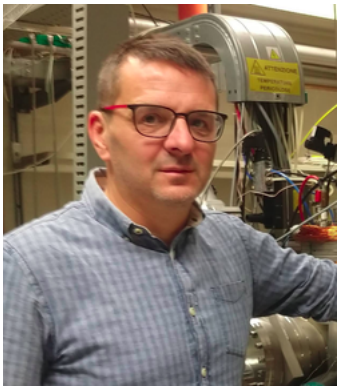
**Abstract:** The epitaxial growth of semiconductor heterostructures offers the unique possibility of combing band-gap and strain engineering to obtain "novel" materials starting from well-known bulk semiconductors. In the case of Group IV elements, fabrication and processing techniques, developed for microelectronics applications, can also be exploited, prior or after epi-growth, to tailor the physical properties of nano- and micro-structures.

The Colloqium will focus on the physical properties and applications of engineered Si, Ge and Sn epilayers and heterostructures, obtained by combining epitaxial growth, substrate patterning and pulsed-laser melting..

**Giovanni Isella** is Full Professor at the Physiscs Department of the Politecnico di Milano. His research interests are focused on the epitaxial growth and applications of silicon-germanium (SiGe) heterostructures and devices. Over almost 20 years of activity, G. I. had the chance to explore the wealth of possibilities offered by strain and bandgap engineering in SiGe heterostructures in a variety of application fields including: quantum transport in Ge quantum wells (QW), near- and mid-infrared integrated optics in SiGe waveguides and multiple-QW modulators, thermoelectric generation in low-dimensional semiconductors, spintronics in Ge heterostructures, epitaxial growth on patterned substrates, plasmonic effects in heavily doped Ge and the development of qubits based on hole states in Ge.

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