

Giovanni Isella

Dip. di Fisica, Politecnico di Milano –Polo Territoriale di Como

via Francesco Anzani 42, 22100 Como, Italy

tel: +39 0313327303

e-mail: giovanni.isella@polimi.it

SUMMARY

G. I. graduated in Nuclear Engineering at the Politecnico di Milano, Italy in 1997 and holds a Ph.D. in Physics from the same institution. Between 2001 and 2002 G. I. has been working on the deposition and characterization of silicon-germanium heterostructures at the ETH-Zürich. In 2002 he obtained a faculty researcher position at the Physics Department of the Politecnico di Milano-Italy where he continued to work in the field of SiGe epitaxy. Since 2007 he is leading the SiGe epitaxy team at the laboratory for nanostructures epitaxy and spintronics on silicon (LNESS-Politecnico di Milano). In 2014 he became Associate Professor at Polimi and in 2017 the director of the laboratory for nanostructures, epitaxy and spintronics on silicon (LNESS). His current interests and expertise include: spin dynamics in Ge quantum wells, infrared light detection and modulation in SiGe heterostructures, Ge deposition on patterned substrates, integration of III-V semiconductors on Ge/Si, SiGe heterostructures for thermoelectric power generation. He is co-author of more than 200 peer-reviewed publications on international journals .

EDUCATION

1999-2001 Ph. D. in Physics, Physics Department, Politecnico di Milano.

Dissertation: "Spin polarized empty states spectroscopy of thin films and multilayers" supervisor Prof. F. Ciccacci. Ph. D. student internship: Federal Institute of Technology - ETH-Zürich Switzerland

ACADEMIC EMPLOYMENT

POSTDOCTORAL TRAINING

2001- 2002 Post. Doc. Fellowship at the Federal Institute of Technology - ETH-Zürich.

During his post-doctoral activity G. I.'s interests moved towards experimental semiconductor physics. Under the supervision of Prof. H. von Känel G. I. performed structural and electrical characterizations of SiGe epilayers by, atomic force microscopy (AFM), X ray diffraction (XRD) and low temperature electrical measurements (Hall effect and magnetoresistance).

2002 In June 2002 the SiGe epitaxy laboratory directed by Prof. von Känel moved from the ETH-Zürich to the newly funded laboratory for nanostructures on silicon and spintronics (LNESS) based at the Polo Territoriale di Como - Politecnico di Milano, Italy. G. I. gave a

relevant contribution in setting up the infrastructures and facilities of LNESS (liquid/gas nitrogen distribution system, clean room, mechanical workshop).

ACADEMIC CAREER

2002-2014 Winner of a faculty researcher position, Physics Department, Politecnico di Milano - Polo di Como.

As a faculty member of the Physics Department G. I. was part of the SiGe epitaxy team lead by Prof. H. von Känel, at that time full professor at the Politecnico. G. I. continued his research activity in the field of SiGe epitaxy by being involved in a network of international collaborations aimed at exploiting the excellent quality of SiGe heterostructures deposited by LEPECVD in different research areas such as the deposition of Ge relaxed layers on Si for III-V solar cells integration and the deposition of amorphous/microcrystalline Si for photovoltaic applications.

2007 G. I. takes over the responsibility of leading the SiGe epitaxy team in the following research areas:

- Fabrication of Ge/Si heterojunction photodiodes. Ge deposited by LEPECVD allowed for the fabrication of infrared photodiodes with an extremely low dark current which are also compatible with CMOS technology.
- Ge/SiGe multiple quantum wells (QW) for optoelectronic applications (quantum confined Stark effects modulators)
- Integration of III-V nanostructures on Si. Ge deposited at low temperature by LEPECVD
- Spin orientation in Ge. The potentialities of Ge and SiGe heterostructures in the field of spintronics are investigated activating a series of collaborations with various experimental and theory groups.
- Deposition on patterned substrates. A novel growth mode, leading to the formation of micrometer-size crystal is evidenced by depositing Ge on Si patterned substrates by LEPECVD. This method can be used for the study of dislocation dynamics and to design novel optoelectronic devices also based on III-V/SiGe heterostructures.
- Deposition of SiGe superlattices for thermoelectric applications. Quantum confined of carriers and phonon dispersion engineering can be used to control the thermoelectric properties of SiGe heterostructures.

2014 Associate Professor at the Physics Department of the Politecnico di Milano achieved in Ge/SiGe structures, the first InGaAs/GaAs quantum well laser monolithically integrated on Si by means of a SiGe buffer, excellent gigahertz Ge photodetectors integrated on Si.

In June 2002 the SiGe epitaxy laboratory directed by Prof. von Känel moved from the ETH-Zürich to the newly funded laboratory for nanostructures on silicon and spintronics (LNESS) based at the Polo Territoriale di Como – Politecnico di Milano. I gave a relevant contribution in setting up the infrastructures and facilities of LNESS (liquid/gas nitrogen distribution system, clean room, mechanical workshop).

2017 Director of the Laboratory for Epitaxy, Nanostructures and Spintronics on Silicon (LNESS).