STEFANO LARENTIS

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Website: stefanolarentis.github.io Italian Citizen – F-1 Visa Holder eligible for OPT

Objective: *Seeking a process integration, device, yield, reliability engineer position in the semiconductor industry.*

EDUCATION

University of Texas at Austin, Austin, TX — 08/2011 - expected 08/2018
Ph.D., Electrical Engineering Track: Solid-State Electronics — GPA: 4.0/4.0

Politecnico di Milano, Milan, Italy — 09/2009 – 07/2011
M.S., Electronic Engineering Track: Solid-State Electronics — GPA: 28.2/30.0

Politecnico di Milano, Milan, Italy — 09/2006 – 07/2009
B.S., Electronic Engineering *summa cum Laude* — GPA: 28.9/30.0

RESEARCH EXPERIENCE (GOOGLE SCHOLAR)

University of Texas at Austin, Microelectronic Research Center, **Prof. Emanuel Tutuc** 01/2012 – Present
National High Magnetic Field Laboratory, Tallahassee, FL – **Visiting researcher** 11/2016, 04/2017, 09/2017

- Developed state of the art transfer techniques to fabricate all-2D material heterostructures, an analogue to epitaxy. Designed *transition metal dichalcogenides* (TMDs) FETs process flow. Integrated dual-gated TMD FETs fully encapsulated in hBN dielectric using a bottom contact architecture to obtain *low resistance contacts*.
- Investigated TMDs (MoS_2, $MoSe_2$, $MoTe_2$) electron transport, measuring *mobility temperature dependence* and characterizing scattering mechanisms. Introduced a novel method to measure *TMDs band offset*, using a graphene heterostructure. Conducted magnetotransport studies to probe TMDs' *bandstructure* (determined *electron m**, valley population) quantum Hall effect and electron-electron interaction (*negative capacitance*).

S. Larentis, H. C. P. Movva, K. Kim, B. Fallahazad, A. Behroozi, S. K. Banerjee, and E. Tutuc*, Large effective mass and interaction-enhanced Zeeman splitting of K-valley electrons in $MoSe_2$*, Under review (2018)

S. Larentis, B. Fallahazad, H. C. P. Movva, K. Kim, A. Rai, T. Taniguchi, K. Watanabe, S. K. Banerjee, and E. Tutuc, *Reconfigurable Complementary Monolayer $MoTe_2$ Field-Effect Transistors for Integrated Circuits*, ACS Nano (2017)

S. Larentis, J. R. Tolsma, B. Fallahazad, D. C. Dillen, K. Kim, A. H. MacDonald and E. Tutuc, *Band Offset and Negative Compressibility in Graphene-MoS_2 Heterostructures*, Nano Lett. 14 *(*4), 2039*,* (2014)

S. Larentis, B. Fallahazad and E. Tutuc*, Field-effect transistors and intrinsic mobility in ultra-thin $MoSe_2$ layers,* Appl. Phys. Lett.*,* 101*,* 223104, (2012)

Politecnico di Milano, *Department of Electronics*, **Prof. Daniele Ielmini** 09/2010 – 08/2011

- Performed NVM cell electrical characterization (DC, pulsed) for unipolar (NiO_x) and bipolar (HfO_x) RRAMs.
- Developed resistive switching electro-thermal models, using finite-element methods, describing set, reset, multi-level operation and retention, allowing for scaling/reliability projections and disturb extrapolation.

S. Larentis, F. Nardi, S. Balatti, D. C. Gilmer, and D. Ielmini, *Resistive Switching by Voltage-Driven Ion Migration in Bipolar RRAM—Part II: Modeling*, IEEE Trans. on Electron Devices, 59, (9), 2468, (2012) (Video)

S. Larentis, C. Cagli, F. Nardi, D. Ielmini, *Filament diffusion model for simulating reset and retention processes in RRAM,* Microelectron. Eng.*,* 88 (7), 1119, (2011)

SKILLS AND AWARDS

Semiconductor and Device Physics, Device Fabrication: (e-beam) lithography, dry/wet etch, e-beam evaporation, sputtering, ellipsometry, ALD and oxide growth, optical (laser) microscopy. Maintained a custom UHV annealing tool; **Material Characterization**: AFM, SEM, XRD, Raman and Photoluminescence; **Device Characterization**: parameter analyzer, lock-in, capacitance bridge measurements in probe-stations & cryostats at low temperatures (1.4 K) and high magnetic fields (35 T); pulsed measurements (oscilloscope and signal generator); **Modeling and Simulations**: Matlab, Comsol, Mathematica, C/C++; **Data Analysis**: Origin; **Hardware Interface**: LabView, Layout CAD; **Team Work**: supervised 6 undergraduate and junior graduate students, teaching assistant for three different EE upper division undergraduate classes; **Vendor Relationship**: selected and ordered equipment worth >$100K.

• **TECHCON 2014, Best in Session Award**, Austin, TX • **INFOS 2011, Best Student Paper Award**, Grenoble, France