

Alessandro Pitant [REDACTED]

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<http://web.nano.cnr.it/Good-Vibes/index.html>

Metrics: H-index 20/22 (Scopus/Google Scholar)

Current address:

NEST - National Enterprise for nanoScience and nanoTechnology
CNR, Istituto Nanoscienze and Scuola Normale Superiore
piazza San Silvestro 21, 56126 Pisa – Italy

Qualifying skills:

National (italian) qualification for 2nd category professorship, Abilitazione Scientifica Nazionale (2017 - 2023)

Education and work experiences:

- December 2017 - Present: **Permanent Researcher**, (Ricercatore livello III), CNR position corresponding to assistant professor at CNR-NANO@NEST, Pisa (Italy), **Adjunct professor** at University of Pisa.
From July 2014 - December 2017: Temporary Researcher at CNR-NANO@NEST.
Activity: Fabrication, design and characterization of opto-mechanical and and electro-mechanical devices operating in the NIR or THz spectral range. Strain engineering of 2D materials.
- April 2012 - May 2014: Post-Doctoral Marie Curie fellow at California Institute of Technology - CALTECH (United States of America), prof. [REDACTED] group.
Activity: Fabrication, design and characterization of opto-mechanical and and electro-mechanical devices.
- April 2010 - April 2012: Post-Doctoral fellow at NEST, Scuola Normale Superiore and CNR - Istituto di Nanoscienze (Italy), dr. [REDACTED] group.
Activity: Fabrication, design and characterization of Quantum-Cascade Lasers based THz sources and nanowire based THz detectors.
- November 2006 - February 2010: PhD student at Nanoscience lab., Department of Physics, University of Trento (Italy) - Supervisor: prof. [REDACTED].
Activity: Experimental characterization and theoretical design of complex photonic silicon based structures. Spectroscopy of rare-earth doped materials (EC LANCER project - FP06).
Doctoral thesis: Light-matter interactions in silicon nanophotonic structures.
- September 2006: Master Thesis in Physical and Astrophysical Sciences at the University of Pisa, mark 110/110.
Thesis topic: Condensed matter physics - Theoretical calculation of electronic states and optoelectronic properties of group IV (Si and Ge) based superlattices with Tight-Binding method. Advisor: prof. Giuseppe Grosso.

Research projects:

As principal investigator:

CNR Short Term Mobility 2018: funding for visiting a laboratory abroad (NTT Lab., prof. Yamaguchi, Jan. 2019).

ATTRACT GRANT (2019-2020): dedicated to the realization of color-sensitive Golay cells based on graphene and operating in the THz range. Responsible for CNR-Pisa unit.

FETopen PHENOMEN (2016 - 2020): dedicated to the realization of phononic transceivers controlled by optical forces. Responsible for CNR-Pisa unit Work-Package leader and member of the steering committee.

Marie Curie IOF NEMO (2012 - 2014): dedicated to the realization of micromechanical systems coupled to both optical and electrical excitations. Outgoing host @CALTECH (prof. Painter's group). Principal investigator.

SNS Semiconductor Nanowire THz detectors (2011-2012): dedicated to the realization of nanowire-based detectors working at THz frequencies. Principal investigator.

CNR PhoSpiR (2011): dedicated to the realization of integrated whispering gallery mode resonators for novel effects in lasing systems. Principal investigator.

As scientific collaborator:

ERC Advanced Grant Soul Man (2014 - 2019): dedicated to the investigation of optomechanical THz Quantum-Cascade lasers.

CNR ApPLE (2011): dedicated to the realization of quasi-crystal photonic structures for light emission control and beam shaping at THz frequencies.

EC LANCER (2006-2009): dedicated to the design and characterization of an Er-doped waveguide optical amplifier sensitized with Silicon nanoclusters.

EC PHOLOGIC (2006-2009): dedicated to the design and characterization of an integrated optical switch based on Silicon-nanocrystals filled Si slot waveguides.

Conferences:

Organizer of the Frontiers of Opto- and Electromechanics workshop, in Fai della Paganella, Trento - Italy from January 27th to January 30th 2014. (Co-chair [REDACTED]).

Awards:

- Best PhD student in Trento University for academic year 2008/2009.
- Caltech Art of Science 2013 - third place: <http://www.artofscience.caltech.edu/archive/2013/safavi-naeini-a.html>
- Winner of Accademia Nazionale dei Lincei, "Di Braccio" award 2015, reserved to the best young Italian physicists.
- Raith Micrograph Award 2015 - second place: <https://www.raith.com/company/micrograph-award/winning-notification-2015.html#main>

Invited talks and seminars:

META 2019, *Dynamical chiral metasurfaces: mechanical based modulation and polarimetry*, Lisbon - Portugal.

HIGHLIGHTS IN NANOSCIENCE, NEST annual meeting 2019, *Nano-Mechanics at NEST: NIR and THz light control and strain engineering of 2D Materials*, Pisa - Italy

CNR Nanoscience Institute meeting 2018, *Optomechanics of chiral dielectric metasurfaces*, Pisa - Italy

A fresco of contemporary condensed matter physics 2018 - symposium in honour of prof. Giuseppe Grosso, *Quantum electromechanics on silicon nitride membranes*, Pisa - Italy

MPLP 2018, *THz QCL in a hybrid microdisk-dipole antenna resonator: a playground between optics and electronics*, Novosibirsk - Russia

ImagineNano 2018, *Silicon nitride membranes: jack of all electromechanical trades*, Bilbao - Spain

December 2016 - *Towards a microwave to near-infrared coherent interface with optomechanical systems- LENS Lab., Florence, Italy.*

December 2015 - *Optomechanics with active optical systems - University of Pisa, in Lights of Tuscany 2015.*

June 2015 - *Opto- and Electromechanics with silicon nitride: quantum state transfer and novel applications - Politecnico di Milano, Italy.*

May 2015 - *Electromechanics with silicon nitride membranes - CNR-NANO Colloquia, NEST Lab., Pisa, Italy.*

July 2013 - *Hybrid electro-optomechanical devices for quantum state transfer - Physics Department, University of Trento, Italy.*

September 2010 - *Emission and detection of light at THz frequencies - Physics Department, University of Trento, Italy.*

October 2009 - *Silicon nanocrystals as an enabling photonic material - NEST, Scuola Normale Superiore, Pisa, Italy.*

December 2008 - *Whispering-Gallery Mode Micro-Kylix Resonators: Purcell effect, Stress-Induced Q-Factor Tuning and Enhancement - Gruppo di Teoria dei Solidi, Laboratorio di Spettroscopia Ottica, University of Pavia, Italy.*

Teaching experience:

2008 – 2009: Assistant lecturer for Fisica I course (Classical Mechanics and Thermodynamics), University of Trento

2017 – 2020: Co-professorship for Solid State Physics course (with prof. Roddaro), University of Pisa

Supervision of Grad Students and Postdoctoral Fellows

2014 – 2020: 1 temporary researcher, 4 post-docs, 4 graduate students (1 already graduated), 4 master students

Research skills:

Design & Simulations: MIT Meep (EM FDTD) and Mpb (EM PWE), Photon Design Fimmwave and Crystalwave, COMSOL Multiphysics (FEM solver), Tight Binding for electronic and optical properties of multi-quantum-well heterostructures. Good knowledge of: C, Fortran, LATEX, MATLAB, Scheme, Mathematica, php, Python (familiarity).

Fabrication: Optical and electron-beam lithography, metal deposition by thermal and e-beam evaporation, wet and dry etching (RIE, ICP-RIE). Focused Ion Beam. Wire bonding. SEM, AFM, Optical and contact profilometer.

Characterization: Visible, infrared material spectroscopy on bulk and nanodevices with CW and pulsed lasers: PL, EL, Shifting Excitation Spot, spectrophotometer, m-line, transmission/reflection in free space and with optical fibers. Optical gain measurements (Variable Stripe Length, Pump & probe). Fourier Transform spectroscopy of quantum cascade lasers and emitters. Interferometry: Laser-Doppler Vibrometry, Self-mixing.