

VITO VURRO

PHD



INFO AND CONTACT

- Born on: 05-May-1988, Bari (ITA)
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PERSONAL SKILLS

- Team player
- Positive Attitude
- Pragmatism
- Enthusiasm and Personal Drive
- Problem Solving
- Flexibility

LANGUAGE

- Italian - Native
- English - Advanced

ABOUT

I'm currently a post-doc at the Physics Department of the University of Bologna working on organic optoelectronics devices for sensing application. My background has been developed at the interface of physics, optoelectronics, material Science and biotechnology.

I carry on my research working on material characterization, micro- and nano-fabrication as well as sensing device realization. Besides these topic, I'm still interested and involved in living cells photostimulation with a particular attention to muscle cells and tissue for bio-hybrid robotic, rehabilitation and biomedical application.

CURRENT POSITION

POST-DOC at Physics Department, Alma Mater Studiorum Università di Bologna , Bologna(ITA).

I am part of the semiconductor physics group lead by prof. Beatrice Fraboni, and I'm involved in developing and characterized sensors based on organic material on plastic and textile substrate. I help managing PhD students and coordinating the research activity. My expertise revolves around micro- and nano-fabrication, optical spectroscopy, cell electrophysiology

SUMMARY OF RESEARCH ACTIVITY

Author of 12 peer-reviewed papers of which 5 as first author.

- h-index: 7 (Google Scholar), 5 (Scopus).
- Citations: 162 (Google Scholar), 94 (Scopus).

Last Updated: 20/12/2022.

TEACHING EXPERIENCE

Teaching Assistant

2019 - 2021 @ Politecnico di Milano (ITA), Course "Physics II" about Electrostatic and Electromagnetism

SKILLS

Material Processing - Device Microfabrication - Interface Characterization (Morphological and Electrical) - 3D Printing - Spectroscopy (steady state and transient) - Cell Culturing and Maintenance - Cell Signaling - Cell Electrophysiology - Tissue Engineering - Microscopy - Immunofluorescence - Image and Video Analysis and Processing - Signal Transduction and Processing - PCB Prototyping

EDUCATION

PHD - PHYSICS

Politecnico di Milano (ITA), February 2021

- Major in Applied Physics and Biophysics Spectroscopy - Cell Culturing - Confocal Microscopy - Immunostaining - Video Analysis - Electrophysiology - Cell Signaling - Tissue Engineering
- PhD Thesis: Non Genetic Optostimulation for Biohybrid Light-Driven Actuators

MASTER OF SCIENCE - PHYSICS

University of Bologna (ITA), March 2017

- Major in Applied Physics
Complex System - Physics Applied to Medicine - Data Analysis - Electronic Design - Image Analysis - Physical Methods of Biology - Models and Numerical Methods for Physics
- Training - Low intensity signal set up for living cells growth development
- Master thesis - "Organic Electrochemical Transistor: a tool for cell tissue monitoring"

BACHELOR OF SCIENCE - PHYSICS

University of Bari (ITA), July 2014

- Mathematical and Physical Analysis - Problem Solving - Computer Programming - Laboratory Skill
- Training - Development of a guitar tuner in LabVIEW
- Bachelor thesis - "Dalle Valvole ai MOSFET: il concetto di Alta Fedeltà"

RESEARCH EXPERIENCE

Post-Doc, Center for NanoScience and Technology, IIT@Polimi, Milan (ITA), March 2021 - February 2023

Development and characterization of innovative phototransducer for living cell photostimulation, Realization of Light-Driven Biohybrid Actuators, Muscle Cells 3D Printing

Visiting Fellow

DBG group, Harvard University, Cambridge (USA), March to August 2020

Mainly on microfabrication techniques for tissue engineering (Interface patterning and characterization) and muscle cell layer and tissue realization.

Editor and Reviewer for International Journal

EDITOR - Special Issue, Frontiers in Electronics - "*Bioelectronic Devices for Biomedical, Diagnostic and Health Care Applications*"

REVIEWER - Referee for Optical Materials X

AWARDS

Best Communication @ SIF 2022 (12-16 September 2022) - Milan (ITA) - "*Muscle Cells and Tissues Photostimulation*"

As Organizer:

- **International School on Bio hybrid interfaces, organic bio electronics and bio photonics** (5-9 September 2022) - Como (ITA)
- **Materials for Sustainable Development Conference (MAT-SUS)** - Symposium Organizer (16-20 October 2023) - Torremolinos (SPA)

As Invited Speaker

- **Workshop "Next Generation Sustainable Bio-mimetic, Bio-inspired and Bio-enabled Materials"** (September 2022) - Venezia (ITA) - "Bio-hybrid Light-driven Actuation"

Oral Contribution:

- **MRS Fall Meeting** (December 2022) - Boston (USA) - "Membrane-Targeted Photoswitch Induces Cardiac Cells and Tissue Optical Pacing"
- **Italian Soft Days** (September 2022) - Bari (ITA) - "Muscle Cells and Tissue Optical Pacing"
- **SIF** (September 2022) - Milan (ITA)- "Muscle Cells and Tissue Photostimulation"
- **MRS Fall Meeting** (December 2021) - Boston (USA) - "*Cardiac Cells Non-Genetic Optostimulation*"
- **MRS Fall Meeting** (December 2019) - Boston (USA) - "*Cardiomyocytes Optical Stimulation*"
- **IFSOE** (September 2019) - Moscow (RUS) - "*Cardiomyocytes Optical Pacing Mediated by micro-patterned polymer interfaces*"
- **CNST Winter Workshop** (December 2018) - Boston (USA) - "*Cardiomyocytes Optical Stimulation*"
- **Materials** (October 2018) - Bologna (ITA) - "*Polymeric micro-patterned Film for Optical Cell Layer Pacing*"
- **EOSAM** (October 2018) - Delft (NLD) - "*Optical Stimulation of Human Cardiomyocytes*"

Poster Contribution:

- **MRS Fall Meeting** (December 2022) - Boston (USA) - "NIR-Sensitive Polymer for Living Cell Photostimulation"
- **MRS Fall Meeting** (December 2021) - Boston (USA) - "Micro Patterned Polymer Interfaces for Muscular Cells Alignment and Stimulation"
- **Orbitaly** (October 2019) - Naples (ITA) - "*Cardiomyocytes Optical Stimulation*"
- **Orbitaly** (October 2018) - Milan (ITA) - "*Optical Stimulation of Human Cardiomyocytes*"
- **eMRS Fall Meeting** (June 2018) - Strasburg (FRA) - "*Optical Stimulation of Human Cardiomyocytes*"

School and Workshop:

- **Ciamician Photochemical School** (June 2019) - Bologna (ITA)
- **EPS Photobiology School** (June 2018) - Bressanone (ITA)

OUTREACH

SCIENTIFIC DISSEMINATION - "SCIENZA INFUSA"

How the scientific approach changes the way you look at reality (December 2016) - Bologna (ITA) - "Le Cellule ci parlano: come ascoltarle"

SCIENTIFIC DISSEMINATION - "EUROPEAN RESEARCHERS' NIGHT"

Tutorial on the spectra acquisition and recognition of human voice (September 2014) - Bari (ITA)

MAIN PUBLICATIONS

APL Photonics - "Computational Based Time-Resolved Multispectral Fluorescence Microscopy" - March 2023 - DOI: 10.1063/5.0135452

iScience - "Optical modulation of excitation-contraction coupling in human induced pluripotent stem cell-derived cardiomyocytes" - March 2023 - DOI: 10.1016/j.isci.2023.106121

Advanced Materials - "Stable and Solution-Processable Cumulenic sp-Carbon Wires: A New Paradigm for Organic Electronics" - March 2022 - DOI: 10.1002/adma.202110468

Applied Physics Letter - "A perspective on the use of light as a driving element for bio-hybrid actuation" - February 2022 - DOI: 10.1063/5.0078411

Journal of Physical Chemistry B - "Shedding Light on Thermally Induced Optocapacitance at the Organic Biointerfaces" - September 2021 - DOI: 10.1021/acs.jpccb.1c06054

APL Materials - "The Physics of Plasma Membrane Photostimulation" - February 2021 - DOI: 10.1063/5.0037109

Frontiers in Materials - "Molecular Design of Amphiphilic Plasma Membrane-Targeted Azobenzenes for Non-Genetic Optical Stimulation" - January 2021 - DOI: 10.3389/fmats.2020.631567

Advance Photonic Research - "A Polymer substrate for Skeletal Muscle cells Alignment and Photostimulation" - November 2020 - DOI: 10.1002/adpr.202000103

Advanced Science - "Membrane Environment Enables Ultrafast Isomerisation of Amphiphilic Azobenzene" - March 2020 - DOI: 10.1002/advs.201903241

Nature Nanotechnology - "Neuronal Firing Modulation By a Membrane-Targeted Photoswitch" - February 2020 - DOI: 10.1038/s41565-019-0632-6

Advance Healthcare Material - "Optical Pacing of Human-Induced Pluripotent Stem Cell-Derived Cardiomyocytes Mediated by a Conjugated Polymer Interface" - May 2019 - DOI:10.1002/adhm.201900198

Advance Material Technology - "Organic Electrochemical Transistor: Smart Devices for Real-Time Monitoring of Cellular Vitality" -Septembre 2019 - DOI: 10.1002/admt.201900207