

# Maria Alessandra Cutolo

Naples, Italy



## EDUCATION

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From 2016 to 12/07/2019 **Master degree at University of Naples Federico II**

- Thesis title: "Lab-on-Fiber" thermo-plasmonic platforms for the localized release of drugs.
- Matter: Integrated Photonics
- Tutors: Giovanni Breglio, Andrea Cusano
- Age at graduation: 24
- Official duration of the study course: 2 years
- Final grade: 110/110
- Graduation date: 12/07/2019

From 2013 to 5/10/2016 **Bachelor degree at University of Naples Federico II**

- Thesis title: A comparison of the magneto caloric materials in an AMR cycle in the range of ambient temperatures
- Matter: Transmission of heat
- Tutor: Adriana Greco
- Age at graduation: 21
- Official duration of the study course: 3 years
- Final grade: 91/110
- Graduation date: 5/10/2016

## PROFESSIONAL EXPERIENCE

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07 July 2021 **Qualification for the profession of engineer.**

From 2020 to current date **Phd in ITEE (36° Cycle) at University of Naples Federico II**

The aim of this research doctorate is the design, implementation and validation of a fiber optic liquid biopsy system for early diagnosis of tumor pathologies. This system is based on the creation of "sers" substrates (Surface enhanced Raman scattering) or on the nanofabrication of plasmonic surfaces.

From 2019 to July 2021 **Electronic Engineer at Cerict (BN)**

- Development of thermo-plasmonic platforms with a view to the localized release of drugs through microgel.
- Design of a needle as an ultrasound probe for selective and localized destruction of cancer cells.
- Design and development of a barcode and QRcodes for a low cost wireless sensor for structural, medical and environmental monitoring.
- Design of an innovative in-line control system for soft tissue and bone drilling.

From 2018 to 12/072019     **Internship at University of Sannio (Benevento,NA)**

- Main activities and responsibilities: Design and validation of a Thermo-plasmonic fiber optic in Comsol environment.
- Skills and objectives achieved: Ability to perform numerical simulations in Comsol and to process data in Matlab. Practical experience of different laboratory tools. Design of an innovative in-line control system for bone and soft tissue.

From 2013 to 2018     **Tutor to students**

- Subjects: Maths and Physics

## PUBBLICATIONS

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### **Paper:**

**Authors:** Maria Alessandra Cutolo, Antimo Migliaccio, Lucia Altucci, Antonello Cutolo, Andrea Cusano. **Title:** An Innovative High Frequency Hyperthermia Approach against SARS-Cov-2 and Related Virus: Feasibility Analysis. *Archives of Clinical and Biomedical Research* 5 (2021): 421-432.

**Authors:** Sofia Principe, Martino Giaquinto, Alberto Micco, Maria Alessandra Cutolo, Michele Riccio, Giovanni Breglio, Andrea Irace, Armando Ricciardi, Andrea Cusano. **Title:** Thermo-plasmonic lab-on-fiber optrodes, *Optics & Laser technology*, Volume 132, 2020, 106502, ISSN 0030-3992, <https://doi.org/10.1016/j.optlastec.2020.106502>.

### **Patents:**

**Title:** Barcodes and QRcodes for a low cost wireless sensor for structural monitoring, medical and environmental. **Application number:** 102020000003479 . **Date of submission:** 20/02/2020.

**Authors:** Cutolo Antonello, Cusano Andrea, Iele Antonio, Bruno Francesco, Cutolo Maria Alessandra

**Title:** Innovative in-line control system for drills for bone and hard tissue drilling. **Application number:** 102020000003494. **Date of submission:** 20/02/202. **Authors:** Califano Luigi, Cafiero Carlo, Cusano Andrea, Cutolo Antonello, Giaquinto Martino, Cutolo Maria Alessandra.

### **Events:**

**TTMeetUP 2020 (Fondazione R&I) Title:** Barcodes and QRcodes for a low cost wireless sensor for structural monitoring, medical and environmental. **Authors:** Cutolo Antonello, Cusano Andrea, Iele Antonio, Bruno Francesco, Cutolo Maria Alessandra.

**TTMeetUP 2020 (Fondazione R&I) Title:** Thermo-plasmonic lab-on-fiber optrodes. **Authors:** Sofia Principe, Martino Giaquinto, Alberto Micco, Maria Alessandra Cutolo, Michele Riccio, Giovanni Breglio, Andrea Irace, Armando Ricciardi, Andrea Cusano.

## TOOLS AND INSTRUMENTATION

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<b>Office</b>	Technical documents preparation
<b>LTspice</b>	Basic simulation during exams
<b>Fusion 360</b>	Basic circuit implementation during exams
<b>Mbed</b>	Basic program in C during exams
<b>Matlab</b>	Data analysis and images elaboration
<b>Comsol</b>	Design and simulation of multiphysics structures: <ul style="list-style-type: none"><li>▪ Control system for soft tissue and bone drilling.</li><li>▪ Ultrasound probe for selective and localized destruction of cancer cells.</li><li>▪ Thermoplasmonic structure.</li><li>▪ Nanostructures for “sers” applications.</li></ul>

### Instrumentation:

- AFM(Atomic force microscopy): Acquisition of heigh profile, 3-D profile and cross section of different substrates of gold nanospheres.
- Horiba Hr evolution: a microscope of latest generation that allows to perform both Raman, Sers and Ters measurements. Currently only Raman measurements have been performed.
- Instrumentation related with optic fibers:
  - Instrumentation for splicing and connection.
  - Sled source at different wavelengths.
  - Osa for characterization of tests (usually optic fiber with nanostructure on the tip).
  - Powermeter (for validation of power optic laser source and for small simple circuit).
  - Optical Microscopy (for image acquisition of optical fiber tip functionalized).
  - Dip coating (for Microgel deposition on optical fiber tip).
  - Peltier cells and thermocouples (for validation of thermal structures).
  - FLIR SC7000 (for thermal imaging acquisition of optical fiber tip, to understand not only the relation between power and temperature but also to analyze the temperature profile around the tip).
- Chemical instrumentation: Becher, Pipette, dispensers and basic instrumentations just adopted for making deposition solution.
- 3-D Printer.
- Welder.

## ENGLISH

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Level B1 for writing, speaking and reading.

## SOFT SKILLS

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Working in the research field gave me the opportunity to learn how address multiple tasks according to the scheduled planning and the partners involved. The collaboration with foreign research groups made me open mind and prone to teamwork. I am able to combine methodical organization to a proper dose of creativity.

## ADDITIONAL

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- Active in voluntary work without associations in the children's cancer ward.
- I have occasionally treated several injured abandoned animals.
- Sports practiced over the years: swimming, sailing, fencing, dance, tennis.
- Hobby: pottery, snorkeling, painting, drawing, pyrography, glass decoration, sewing, cooking, woodworking.

In compliance with the Italian legislative Decree no. 196 dated 30/06/2003, I hereby authorize you to use and process my personal details contained in this document.

**DICHIARAZIONE SOSTITUTIVA DI CERTIFICAZIONE E DI ATTO DI NOTORIETÀ  
AI SENSI DEGLI ARTT. 46 e 47 DEL DECRETO DEL PRESIDENTE DELLA REPUBBLICA  
DEL 28.12.2000,  
N. 445  
MODIFICATO E INTEGRATO DALL'ARTICOLO 15, COMMA 1, DELLA LEGGE 12  
NOVEMBRE 2011, N. 183**

Al Direttore  
del Dipartimento di Ingegneria  
Università degli Studi del Sannio  
Corso Garibaldi 107 – Palazzo Bosco Lucarelli  
82100 Benevento

Il/La Sottoscritto/a Cognome Cutolo (per le donne indicare il cognome da nubile) Nome Maria  
Alessandra nato/a a Napoli Prov. NA Stato Italia il 22/03/95 sesso Femmina C.F. CTLMLS95C62F839W  
e residente Forio prov. NA indirizzo Via Zaro 11 C.A.P. 80075 Telefono: 3396720822 e-mail  
m.alessandracutolo@hotmail.com PEC SKYPE m.alessandracutolo@hotmail.com

al fine della partecipazione alla selezione, alla procedura selettiva pubblica, per titoli e colloquio,  
conferimento di conferimento di n. 1 (una) borsa studio per attività di ricerca, della durata di n. 6 (sei)  
mesi, da svolgersi presso il Dipartimento di Ingegneria dell'Università del Sannio - DING, dal titolo titolo  
"Supporto allo studio e alla identificazione di tecnologie abilitanti per il monitoraggio delle vibrazioni"  
correlata al Settore scientifico disciplinare ING-INF/01 – Elettronica, nell'ambito del Progetto "MAIA"  
SSD ING-INF/01 sotto la responsabilità del prof. Andrea Cusano.

**DICHIARA**

ai sensi e per gli effetti degli artt. 46 e 47 del T.U. n. 445/2000, così come modificato e integrato  
dall'articolo 15, comma 1, della Legge 12 novembre 2011, n. 183, consapevole delle responsabilità  
assunte innanzi alla legge con il presente atto, e delle sanzioni penali, nel caso di dichiarazioni non  
veritiere, di informazioni o uso di atti falsi, richiamate dall'art. 76 del D.P.R. 445 del 28/12/2000, che  
costituiscono reato e comportano la perdita del beneficio ottenuto,

che tutte le informazioni contenute nel proprio curriculum vitae sono veritiere.

•  sotto la propria responsabilità, consapevole che le dichiarazioni mendaci sono punite ai sensi  
degli articoli 483, 495, 496 del Codice Penale e delle leggi speciali in materia, che le fotocopie  
relative ai titoli rilasciati da soggetti diversi dalle Pubbliche Amministrazioni o dai Gestori di  
Pubblici Servizi, attestanti il possesso dei titoli valutabili, di cui all'art. 3 dell'avviso di selezione, di  
seguito indicate ed allegate alla presente dichiarazione sostitutiva, sono conformi all'originale

Luogo e Data 20/09/2021 Napoli

Il Dichiarante

*Maria Alessandra Cutolo*

Il/La sottoscritto/a inoltre allega fotocopia di un documento di riconoscimento in corso di validità  
ai sensi dell'art. 21 del Decreto del Presidente della Repubblica del 28.12.2000, n. 445 e successive  
modifiche ed integrazioni