

# CURRICULUM VITAE

## PERSONAL INFORMATION

|                         |                                                                      |
|-------------------------|----------------------------------------------------------------------|
| Name and surname        | Simonetta Grilli                                                     |
| Address                 |                                                                      |
| Phone                   |                                                                      |
| Cell.                   |                                                                      |
| Cnr email address       | <a href="mailto:simonetta.grilli@cnr.it">simonetta.grilli@cnr.it</a> |
| PEC address             | <a href="mailto:sgrilli@pec.it">sgrilli@pec.it</a>                   |
| Nationality             | Italian                                                              |
| Place and date of birth |                                                                      |
| Marital status          |                                                                      |

## BIOBLIOMETRICS

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|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hirsch-index                               | 44 (Google Scholar)<br>41 (Scopus)                                                                                                                                                                                                                                                                                                                                                                  |
| Top journals where I published my research | <ul style="list-style-type: none"><li>- <b>Nature Nanotechnology</b> (Impact Factor 40.5)</li><li>- <b>Nature Communications</b> (Impact Factor 17.7)</li><li>- <b>PNAS</b> (Impact Factor 12.8)</li><li>- <b>Advanced Functional Materials</b> (Impact Factor 19.9)</li><li>- <b>Advanced Materials</b> (Impact Factor 32.1)</li><li>- <b>Nature Asia Materials</b> (Impact Factor 10.8)</li></ul> |
| Total number of publications               | More than 200                                                                                                                                                                                                                                                                                                                                                                                       |
| Total number of citations                  | More than 4.900                                                                                                                                                                                                                                                                                                                                                                                     |
| Complete list of publications              | See the following link:<br><a href="https://scholar.google.com/citations?hl=it&amp;user=rM9jPGkAAAAJ&amp;view_op=list_works&amp;sortby=pubdate">https://scholar.google.com/citations?hl=it&amp;user=rM9jPGkAAAAJ&amp;view_op=list_works&amp;sortby=pubdate</a>                                                                                                                                      |

## EDUCATION AND TRAINING

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|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PhD  | <p><b>PhD</b> in Physics at the <b>Royal Institute of Technology</b> in Stockholm (Sweden), with a thesis entitled: "Ferroelectric domain engineering and characterization for photonic applications". The thesis was published as a monograph (book) with the following ISBN code 91-7178-382-2. During the PhD period, the undersigned designed and implemented innovative holographic lithography techniques starting from empty laboratories to be set up. She developed in full autonomy innovative techniques for structuring innovative materials with periodically inverted ferroelectric domains. She coined a new name and a new structuring process called "overpoling", capable of generating regular and periodic domains on a sub-micrometric scale. She developed innovative optical techniques for real-time monitoring of the poling process in ferroelectric crystals. Also in this case, she independently assembled the entire optical apparatus even in different configurations. All this is demonstrated by the scientific products published by the undersigned in ISI journals.</p> |
| Date | 08/06/2006                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Master degree | <p><b>Master degree in Physics with highest honour</b>, University "Federico II" Naples. The thesis concerned the characterization of fluidic media that simulated biological tissues in the context of a research project aimed at the creation of an optical mammograph. For brevity, the undersigned does not describe the entire activity which, also in this case, was carried out in full autonomy.</p> |
| Date          | 13/10/1999                                                                                                                                                                                                                                                                                                                                                                                                    |

## WORK EXPERIENCE

Permanent position at CNR

### **DIRECTOR OF RESEARCH**

Date

**Since 2020 to present**

Place

Istituto di Scienze Applicate & Sistemi Intelligenti (CNR-ISASI)  
Via Campi Flegrei 34, 80078 Pozzuoli (NA), Italia

Activity

Research director and recently coordinator of the European project "SensApp" funded directly by the EC under the Horizon 2020 program, FET-Open call. In the context of SensApp, development of a biosensor with high sensitivity for the detection of traces of biomolecules of interest in the biomedical field for ultra-early diagnosis of neurodegenerative diseases. The results in this field have had great success at the media level with interviews on various radio stations and publication of interviews in public domain magazines (e.g. Viversani; Quotidiano del Sud). Coordinator of a group of researchers, both temporary and permanent, on other research projects (see the research project responsibilities section). The main topics covered in these projects concern optical and holographic methods for high-resolution investigations of materials, which include static and dynamic polymeric structures and biological and biocompatible materials. Study of cellular functions through innovative optical techniques. Development of inkjet printing processes at the nanoscopic level for applications in fields such as molecular biology but also flexible electronics. Pioneering development of methods based on the pyroelectric effect for the structuring of fluid and semi-solid materials at the micro and nanoscopic level with a scientific production of great importance recognized at the international level.

Permanent position at CNR

### **SENIOR RESEARCHER**

Date

Since March 2020 to October 2020

Place

Istituto di Scienze Applicate & Sistemi Intelligenti (CNR-ISASI)  
Via Campi Flegrei 34, 80078 Pozzuoli (NA), Italia

Activity

Same as in the section above "director of research"

Permanent position at CNR

### **RESEARCHER**

Date

Since January 2015 to March 2020

Place

Istituto di Scienze Applicate & Sistemi Intelligenti (CNR-ISASI)  
Via Campi Flegrei 34, 80078 Pozzuoli (NA), Italia

Activity

**Team leader** of a research group of about ten people engaged in activities related to different Research Projects. The main topics concern optical and holographic methods for high-resolution investigations of materials, including static and dynamic polymeric structures and biological and biocompatible materials. Development of innovative techniques for the structuring of soft matter (including 'live cells') through advanced optical techniques to drive cellular functions of strategic interest such as proliferation, growth, adhesion, in order to develop innovative platforms for tissue regeneration. Study of cellular functions through innovative optical techniques. Pioneering development of methods based on pyroelectric effect for the structuring of fluid and semi-solid materials at micro and nanoscopic level with a scientific production of great importance recognized at international level.

Permanent position at CNR

### **RESEARCHER**

Date

Since February 2009 to December 2014

Place

Istituto Nazionale di Ottica (CNR-INO)  
Via Campi Flegrei 34, 80078 Pozzuoli (NA)

Activity

**Team leader** of a research group engaged in activities related to several funded Projects. Main topics: see the section above related to the period in CNR-ISASI.

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|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date     | Since June 2005 to February 2009                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Place    | Istituto Nazionale di Ottica (CNR-INO)<br>Via Campi Flegrei 34, 80078 Pozzuoli (NA)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Activity | I developed innovative optical methods for the study of properties of ferroelectric materials of great importance in the field of optics, using different digital holography apparatuses assembled by the undersigned in various configurations starting from empty laboratories. I developed innovative optical techniques for writing micro and nano-structures in ferroelectric materials via holographic lithography for applications in photonics. I equipped a holographic lithography clean room from scratch. I assembled the entire cutting-edge holographic lithography optical system, considering that a similar system was only present at the laboratories of Prof. Schattenburg (Massachusetts Institute of Technology). During these years, I obtained a prestigious PhD at the Royal Institute of Technology in Stockholm (Sweden) in the group of Prof. Fredrik Laurell, thus acquiring a valuable academic education at a foreign University of great importance. I also received the offer to continue her scientific activity at that foreign University but she decided to remain in Italy for family reasons. |

**Research fellowship**

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|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date     | Since 1 <sup>st</sup> June 2001 to 31 <sup>st</sup> May 2005                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Place    | Istituto Nazionale di Ottica Applicata<br>Via Campi Flegrei 34, 80078 Pozzuoli (NA)                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Activity | I developed innovative optical methods for the study of properties of ferroelectric materials of great importance in the field of optics, using different digital holography apparatuses assembled by herself in various configurations starting from empty laboratories. I developed innovative optical techniques for the writing of micro and nano-structures in ferroelectric materials via holographic lithography for applications in photonics. I equipped a holographic lithography clean room. |

**Process Engineer**

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| Date     | Since 1 <sup>st</sup> June 2000 to 31 <sup>st</sup> May 2001                                                                                                                                                                                                                                                                            |
| Place    | STMicroelectronics, Catania, Italy                                                                                                                                                                                                                                                                                                      |
| Activity | I acquired first-level skills in the field of electronic microscopy with responsibility for the control of the production of flash memories at the M5 block of the Research & Development section in STMicroelectronics in Catania directed by Dr. Melanotte. I belonged to the optical lithography group directed by Dr. Simone Bossi. |

## MANAGEMENT OF RESEARCH PROJECTS

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|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project title | "Newtech", funded directly by the Ministry of Agricultural, Food, Forestry and Tourism Policies, coordinated by CREA (Council for Research and Analysis of Agricultural Economics) |
| Period        | 6/2/2018 – 5/2/2020                                                                                                                                                                |
| Funds         | € 20.000                                                                                                                                                                           |
| Activity      | Management and responsibility of the project activity on the study and control of defects in dairy products through innovative optical techniques.                                 |

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|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title    | "Tecnoqual" project financed directly by the Ministry of Agricultural, Food, Forestry and Tourism Policies, coordinated by CREA (Council for Research and Analysis of Agricultural Economics)                                  |
| Period   | 1/1/2016 – 31/12/2017                                                                                                                                                                                                          |
| Funds    | 20.000 €                                                                                                                                                                                                                       |
| Activity | Management and responsibility of the project activities on the application of a super-sensor developed in the FIRB Project cited below to detect traces of lactose in Grana Padano extracts for quality control in food media. |

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|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title    | Study of cellular differentiation on pyro-electrified materials                                                                                                                                                          |
| Period   | 07/11/2016 – 28/11/2016                                                                                                                                                                                                  |
| Activity | Management and responsibility of the Short-Term Mobility project funded by Cnr, under a collaboration agreement with the research group of Prof. Lorenzo Moroni (Maastricht University), winner of an ERC Grant project. |

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| Title    | PON Project "AquaSystem - Innovative procedures and technologies for planned and integrated management of water resources, energy optimization and quality control in the integrated water cycle", funded by MIUR                                                                                                             |
| Period   | 01/12/2012 – 01/12/2015                                                                                                                                                                                                                                                                                                       |
| Funds    | Around 1.800.000 €                                                                                                                                                                                                                                                                                                            |
| Activity | Management and responsibility of the project activities on the development of an innovative sensor to detect traces of biomolecules and contaminants in aqueous solutions and the development of innovative techniques for the manipulation of bacteria, cells and pathogens in order to obtain effective water purification. |

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| Title    | PON project "Pandion: Study of innovative functional subsystems for space applications," funded by MIUR.                                                                                                                                                                                                                             |
| Period   | 01/10/2011 – 30/04/2015                                                                                                                                                                                                                                                                                                              |
| Funds    | Around 1.500.000 €                                                                                                                                                                                                                                                                                                                   |
| Activity | Participation in the research activity related to the writing of innovative lattices on innovative photosensitive materials through innovative holographic lithography devices assembled by the undersigned. All for aerospace applications for the efficient capture of solar energy to be used as an energy source for satellites. |

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|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title    | Training Project PON01_00375/F6: Pandion, Master in Advanced Materials for Aerospace Applications.                                                                                                                                                                                                   |
| Period   | 01/10/2011 – 30/04/2015                                                                                                                                                                                                                                                                              |
| Funds    | Around 200.000 €                                                                                                                                                                                                                                                                                     |
| Activity | Participation in training activities at the CNR Unit: recruitment of teachers specialized in the topics of the training project (Italians and foreigners); organization of training activities in the laboratory; organization of assessment tests for trainees; organization of activity calendars. |

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| Title    | PON project "EFOR - Energy from renewable sources", funded by MIUR.                                                                                                                                                                  |
| Period   | 2016                                                                                                                                                                                                                                 |
| Funds    | Around 5.000.000 €                                                                                                                                                                                                                   |
| Activity | Management and responsibility of the project activities on the development of innovative materials and technologies based on polymer manipulation through pyroelectric effect for the realization of alternative counter-electrodes. |

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|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title    | Riblets Project - Realization of passive 3D structures like 'riblets' to dampen friction in aerospace applications, within the European Clean-Sky Program                                                               |
| Funds    | 30.000 €                                                                                                                                                                                                                |
| Period   | 1/11/2016 – 1/11/2017                                                                                                                                                                                                   |
| Activity | Management and responsibility of the project activities on the realization of 3D structures through unconventional techniques for the development of riblet-type materials for friction damping in the aerospace field. |

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| Title    | <b>FIRB project</b> "Portable pyro-electro-hydrodynamic biosensor as Nano-Bio-Guard for home-land and food security", Code MIUR RBFR10FKZH, financed directly by the Italian Ministry of Research                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Period   | 08/03/2012 – 08/03/2016                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Funds    | € 766.000 (whole project)<br>€ 521.000 (coordinator CNR-INO)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Activity | <b>Coordination, management and responsibility of the entire FIRB project.</b> I supervised the project from the beginning, conceived the idea, prepared the draft of the project, submitted it to the MIUR and supported the interview in the selection procedure. The consortium was formed by my affiliated Institute CNR-INO (coordinator) and the CNR-IMM Institute. In this project, it developed a biosensor with very high sensitivity (100 times higher than that of traditional ELISA methods) for the detection of biomolecules in trace amounts. The technique proved successful for both oligonucleotides and proteins, paving the way for countless applications in the biomedical field for ultra-early diagnoses but also for environmental and food control for the search for contaminants in trace amounts and for forensic genetics for the recognition of biological traces. The results of the project have been published in high-profile scientific journals including Nature, PNAS, Advanced Materials. These results have also been successful at the media level with interviews given to journalists from the print and radio press. |

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| Title    | Super-sensitive detection of Alzheimer's disease biomarkers in plasma by an innovative droplet split-and-stack approach – <b>SensApp</b><br><b>European Project, Horizon 2020, call FET-Open</b> , financed directly by EC, Grant Agreement nr. 829104<br><a href="http://www.sensapp.eu/">http://www.sensapp.eu/</a><br><a href="https://cordis.europa.eu/project/id/829104">https://cordis.europa.eu/project/id/829104</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Period   | 01/01/2019 – 30/06/2022                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Funds    | € 3.287.562,50 (entire project)<br>€ 831.562,50 (CNR-ISASI, coordinator)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Activity | <b>Coordination of the entire European consortium and management of the entire project.</b> In this project I have been in charge of the project since the beginning. I conceived the project idea, I have supervised the formation of the research consortium, I have shared the project idea with the consortium, I have written the project, I have asked for written contributions to the consortium members, I have submitted the project as coordinator on the EU portal "Funding & Tender opportunities". In fact, the coordinator of the project is the CNR-ISASI Institute. No other Cnr Institutes are involved. The project deals with the development of a 'super-sensor' based on an innovative technique of pyro-electro-hydrodynamic jets for early diagnosis of Alzheimer's disease. The consortium is formed by 6 partners: CNR (coordinator); Vrije University (Belgium); University of Linz (Austria); Technical Research Centre of Finland; Ginolis Oy (Finland); IRCCS "Bonino Pulejo" (Italy). The results have been published in international scientific journals and disseminated to the public through interviews with journalists from print and radio stations. |

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| Title    | "Real 3D: Digital holography for 3D and 4D real-world objects' capture, processing and display"<br>European Project, Call FP7-ICT, Topic "ICT-2007.3.2 – Organic and large area electronics, visualization and display systems", funded directly by EC, Grant Agreement nr. 216105<br><a href="https://cordis.europa.eu/project/id/216105/it">https://cordis.europa.eu/project/id/216105/it</a>                                                                                                                                                                |
| Period   | 01/02/2008 – 31/01/2011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Funds    | € 4.499.997 (entire project)<br>€ 423.348 (CNR-INO, partner)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Activity | <b>Co-Responsibility of Unit Cnr.</b> In this project my Institute was a project partner and I participated in the responsibility of the Institute's activities for the development of innovative holographic optical techniques for the development of next-generation 3D displays. Partners: Oulu University (Finland); Lyncee Tec (Switzerland); EPFL (Switzerland); Holoeye (Germany); BIAS Institute of Technology Bremen (Germany); National University of Ireland Maynooth; CNR; Warsaw University of Technology (Poland); Bilkent University (Turkey). |

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| Title    | PON02_00563_3316357 MAAT "Nanotecnologie Molecolari per la Salute dell'Uomo e l'Ambiente".                                                                            |
| Period   | May 2012 – May 2015                                                                                                                                                   |
| Funds    | € 816.000                                                                                                                                                             |
| Activity | Participation in the activity of realizing innovative methods based on the pyroelectric effect for the fabrication of innovative functionalized polymeric structures. |

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| Title    | "ABiTAS: Advanced bonding technologies for aircraft structures"<br><b>European project, Call FP6-2005-AERO-1</b> , Topic "AERO-1.1 – Strengthening competitiveness", funded directly by EC, Grant Agreement nr. 30996<br><a href="https://cordis.europa.eu/project/id/30996">https://cordis.europa.eu/project/id/30996</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Period   | 01/10/2006 – 31/05/2010                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Funds    | € 4.799.998 (entire project)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Activity | Participation in the sub-contract activity of Alenia Aeronautica development of innovative optical techniques for the pre-treatment of surfaces of materials for aerospace use for the improvement of the 'bonding' processes, and for the development of innovative optical techniques (speckle type) for the monitoring and control of such pre-treatment processes. No. partners 16: Airbus Germany (coordinator); Airbus Spain; Airbus UK; Eurocopter Germany; Dassault Aviation, France; EADS Germany; University of Patras, Greece; Huntsman advanced materials, Switzerland; Upper Austrian Research, Austria; LLA Instruments, Germany; Sonderhoff Engineering Austria; EADS France; Research Centre for non-destructive testing, Austria; Alenia Aeronautica, Italy; Eurocopter France; Fraunhofer, Germany. |

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|----------|--------------------------------------------------------------------------------------------------------------------------------|
| Title    | 'Research for the development of optical sensors for the environment', funded by the Campania Region.                          |
| Period   | 01/01/2002 – 31/12/2006                                                                                                        |
| Funds    | 741.000 €                                                                                                                      |
| Activity | Participation in research activities for the development of innovative optical materials and devices for deformation analysis. |

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|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title    | Project PON01_00625 IT@CHA "Italian Technologies for Advanced Applications in Cultural Heritage", funded by MIUR.                                            |
| Period   | 2011 - 2015                                                                                                                                                  |
| Funds    | 400.000 €                                                                                                                                                    |
| Activity | Participation in the activity for the development of innovative optical techniques for diagnostics in the field of protection and care of cultural heritage. |

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|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title    | Project PON01_01525 MONICA "Innovative Monitoring for Coasts and the Marine Environment".                                                                  |
| Period   | 3 years                                                                                                                                                    |
| Funds    | 1.900.000 €                                                                                                                                                |
| Activity | Participation in the activity for the development of innovative optical techniques for the environmental control of microorganisms in marine environments. |

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|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title    | "Sessaggio seme italiano bovino" (SESSIBOV), funded by the Ministry of Agricultural Policies.                                                                                       |
| Period   | 01/04/2009 – 31/03/2011                                                                                                                                                             |
| Funds    | 370.000 €                                                                                                                                                                           |
| Activity | Participation in the activity for the development of innovative methods for phase contrast microscopy for quantitative analysis of cells for morphometric analysis of spermatozoon. |

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|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title    | RSTL Project "Realization and characterization of ordered nanostructures in ferroelectric crystals for photonics and study of functionalities with electro-optical tunability"                    |
| Period   | 01/01/2008 – 31/12/2009                                                                                                                                                                           |
| Funds    | 113.168 €                                                                                                                                                                                         |
| Activity | Participation in the activity for the development of innovative techniques for the realization and characterization of nanometric structures in ferroelectric crystals for photonic applications. |

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|----------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Title    | 'Development of technologies for laser systems to be used in Computer-to-Plate (CTP) applications for graphic arts', funded by Andromeda S.r.l. |
| Period   | 2009                                                                                                                                            |
| Funds    | 552.000 €                                                                                                                                       |
| Activity | Participation in the activity for the development of laser technologies for advanced systems.                                                   |

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|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title    | "Photonic Integrated Circuits for Optical Telecommunications and Sensors", funded by MIUR.                                                                                                                                                                                                                                                                                                                                                                |
| Period   | 03/03/2004 – 04/05/2007                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Funds    | 750.000 €                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Activity | Participation in the activity to identify and test solutions aimed at the creation of devices that exploit the different optical characteristics, peculiar to lithium niobate crystals (non-linearity, electro-optical and opto-acoustic effects), in different fields of application (sensors for environmental applications, photonic crystals for quantum optics) that integrate the optoelectronic control and regulation functions on a single chip. |

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|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title    | Short-Term Mobility project funded by Cnr, for collaborative activities with the KTH research group in Stockholm, Dr. Carlota Canalias carried out at CNR-INOA Pozzuoli.                                                                                                                                                                                                                                           |
| Period   | 18/06/2004 – 08/07/2004                                                                                                                                                                                                                                                                                                                                                                                            |
| Activity | <b>Management and responsibility of the collaborative project</b> with the prestigious KTH in Stockholm for the development of innovative optical techniques for the control of the structuring process of KTP ferroelectric materials. The undersigned has assembled the measurement apparatus, processed the data, wrote the articles with the results published in ISI scientific journals (see attached list). |

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|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title    | FIRB Project No. RBNE01KZ94 "Photonic Microdevices in Lithium Niobate", funded by MIUR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Period   | 01/01/2003 – 31/12/2006                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Funds    | Around 4.000.000 €                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Activity | Participation in the activity for the development of innovative techniques for the fabrication and monitoring of micro-devices in lithium niobate materials. I developed a new technique of electric poling on the nanometric scale of ferroelectric crystals. I developed several techniques for quantitative characterization of interferometric crystals and poling processes. I realized microdevices such as: electro-optical and 2D modulators for lithography based on Talbot effect array illuminators. I developed a "point diffraction interferometer" type device based on electro-optical effect in LiNbO3 materials. |

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|----------|---------------------------------------------------------------------------------------------------------------|
| Title    | PON "SIMONA" Project – "Integrated Environmental Monitoring System", funded by MIUR.                          |
| Period   | 01/01/2002 – 31/12/2006                                                                                       |
| Funds    | 5.400.000 €                                                                                                   |
| Activity | Participation in the activity for the development of innovative optical systems for environmental monitoring. |

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| Title    | Bilateral project funded directly by Innovation & Technology Provider S.r.l.<br>Study and development of an innovative optical system to rapidly and non-invasively detect and characterize production defects in the encapsulation of infant nutrition products |
| Period   | 2018 – 2024                                                                                                                                                                                                                                                      |
| Funds    | € 50.000                                                                                                                                                                                                                                                         |
| Activity | <b>Project management and coordination</b> for the development of a microscopy system for the detection and study of defects in the encapsulation process in the food industry                                                                                   |

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|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title    | Realization of polymeric micro-supports for spinal cell implantation<br>Bilateral project directly funded by the IRCCS "Bonino Pulejo" of Messina                                                     |
| Period   | 27/6/2017 – 26/6/2022                                                                                                                                                                                 |
| Funds    | € 50.000                                                                                                                                                                                              |
| Activity | <b>Management and coordination</b> of the project for the development of innovative techniques for the manipulation of polymer sheets via pyroelectric effect, for applications in the cellular field |

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|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title    | Bilateral project financed directly by Heinz Italia S.p.A. Study and development of an optical system for a rapid detection of metal-based defects in metal closures employed in packaging containing postbiotic foods |
| Period   | 21/11/2017 – 20/11/2018                                                                                                                                                                                                |
| Funds    | € 32.260                                                                                                                                                                                                               |
| Activity | <b>Project management and coordination</b> for the development of a microscopy technique for the characterization of metallic defects at microscopic scale in capsules used for the packaging of post-biotic foods     |

|          |                                                                                                                                                                                                                                                                                                                 |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title    | Morphological and structural measurements on soft matter samples to be used in the development of bioactive packaging for the food industry, within the "Bio-Sentinel" Project, PON "Business and competitiveness" Project 2014-2020 FESRProgetto Conto Terzi funded by Innovation & Technology Provider S.r.l. |
| Period   | 2022                                                                                                                                                                                                                                                                                                            |
| Funds    | € 20.000                                                                                                                                                                                                                                                                                                        |
| Activity | <b>Management and responsibility</b> of the Third Party project for the characterization of samples of soft material used in the packaging sector in terms of surface properties.                                                                                                                               |

## OTHER RESPONSIBILITIES

Head of the Third Party Research Unit (URT) of CNR-ISASI at the University of Naples "Federico II", Department of Chemical, Materials and Industrial Production Engineering (DICMaPI). (past)

Responsible for different laboratories at CNR-ISASI (optical microscopy; biological sample preparation; holographic lithography; holographic microscopy; nano-printing) (current)

## EDUCATIONAL ACTIVITIES AND TUTORING

Responsible for the course "Pyro-electrohydrodynamics and advanced technologies for soft matter manipulation" in the PhD course in Mathematics, Physics and Applications for Engineering at the University of Campania Luigi Vanvitelli, 4ECTS – 16 h

Responsible for various PhD student projects both with University of Campania "L. Vanvitelli" and with University of Naples "Federico II"

Tutor of various master student projects

Tutor for high school students within projects financed by the Italian Ministry of Research

**Tutoring of young researchers** in the Aerospace Tech Challenge Program funded by the Sviluppo Campania platform, for the start-up project "Bio-sensor for safety and security".

Tutor for various internship students from foreign universities

## PARTICIPATION IN SCIENTIFIC COMMITTEES AND BODIES

Member of the Teaching Board of the Doctoral Course in Mathematics, Physics and Applications for Engineering of the University of Campania "L. Vanvitelli"

Member of the Self -assessment and Insurance Commission Quality of the Doctoral Course in Mathematics, Physics and Applications for Engineering of the University of Campania "L. Vanvitelli"

Member of the address committee of the Mathematics Degree Courses of the University of Campania "L. Vanvitelli"

Independent expert at the European Commission as part of the evaluation of European projects submissible in the FP6-2005 -IST -5 call, VI Picture program - Thematic area "Information Society Technologies" (IST) - Strategic Objectives (So 2.5.1) - IST Call 5. I evaluated European projects to decide their admission to financing.

Member of the CNR competition commission for the hiring of permanent researchers (September 2009).

Member of the European Advisory Committee of the Scientific Society SPIE, a commission of management of the prestigious international SPIE. Evaluation of the disclosure attributes. Organization and evaluation of conferences. Management of didactic activities organized by SPIE. Management of the appointment of the Fellow Spies. Management of formation of training for PhD students. (past)

Referee of articles proposed in ISI magazines such as: Applied Optics, Applied Surface Science, Journal of Applied Physics, Angewandte Chemie, Journal of Optical Society of America, Journal of the American Chemical Society, Langmuir, Microfluidics & Nanofluidics, Measurement Science & Technology, Optical Materials, Optics Communications, Optics Express, Optics Letters, Polymers for Advanced Technologies, Photonics Technology Letters, ACS Applied Materials & Interfaces.

Member of my Institute Council for two mandates (past)

Delegation by CNR President in the Shareholders' Meeting of the Campania Scarl aerospace district

Commission member in competitions for the selection of fixed-term researchers and for permanent positions at CNR

President of Commission for the competition for career advance to Director of Research in CNR, code CNR 316.62, area on Biophysics

President of the CNR Technical Scientific Committee (CTS) for the PRIN 2022 PNRR – PE7 projects

## ORGANIZATION AND RESPONSIBILITY OF SCIENTIFIC EVENTS

**Co-Chair of the international conference** "Optical Methods for Inspection, Characterization, and Imaging of Biomaterials" in the context of the Symposium Spies Optical Metrology, which is held every 2 years in Munich. <http://spie.org/profile/Simonetta.Grilli-30992>

Member of the **Technical Committee** in the above mentioned conference.

Director of the school "**Nano-Tooling**" 2017, doctoral course for University "Federico II" and University of Campania "L. Vanvitelli". <http://nanotoolingschool.isasi.cnr.it/>

**Organization of International** Conference EOS Topical Meeting on Optical Microsystems in 2007, 2009

**Organization of different workshops** in my Institute in cooperation with external research groups

## SCIENTIFIC AWARDS

The european project SensApp has been scored by EC as **Excellent Science Innovation**:  
<https://www.innoradar.eu/innovation/43248>

The paper “(2012) Reversible Fragmentation and Self-Assembling of Nematic Liquid Crystal Droplets on Functionalized Pyroelectric Substrates” **has been selected for journal cover** in Selected Hot Topics, Wiley: <http://www.wiley-vch.de/util/hottopics/liquidcrystals/>

The paper ‘Manipulating thin liquid films for tunable microlens arrays’, P. Ferraro, L. Muccio, S. Grilli, A. Finizio, S. De Nicola, and V. Vespini, *Optics & Photonics News* 19 (12), 34 (2008), has been selected as **best of OPTICS in 2012** from the Scientific Organization OSA.

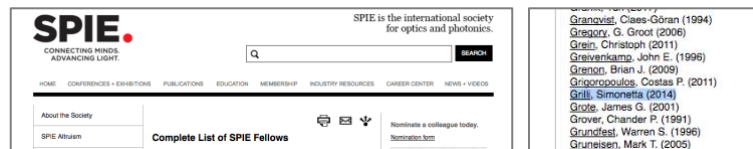
The paper ‘Micro-optical foundry: "freezing" polymer liquid instabilities’ S. Grilli, S. Coppola, V. Vespini, A. Finizio, F. Merola, and P. Ferraro, *Optics & Photonics News* 22(12), 46 (2011), has been selected as **best of OPTICS in 2011** from OSA.

**Cover.** Picture from the paper “(2012) [Reversible Fragmentation and Self-Assembling of Nematic Liquid Crystal Droplets on Functionalized Pyroelectric Substrates](#)” has been selected for the website “The International Liquid Crystal Society”.

**Cover.** Pictures from “(2011) 3D lithography by rapid curing of the liquid instabilities at nanoscale” has been selected as cover for journal PNAS al Vol. 108, issue 37 (2011).

**Cover.** Pictures from the paper “Micro-optical Foundry: “Freezing” Polymer Liquid Instabilities” has been selected for *Optics & Photonics News* Vol. 22.

**SPIE fellow**, a prestigious role in the context of the International Society of Optics SPIE. This information is public and verifiable on the Spies website:



**"Doctoral Thesis Award"**, from the International Society IEEE-LEOS

Prof. Rogers (H-index > 130) wrote a paper on **Nature Nanotechnology News & Views** vol.5, pg. 385 (2010) focused on our paper published on Nature Nanotechnology vol.5, pg.429

**SPIE Women in Optics Planner 2007.** My scientific biography was included in the Agenda SPIE 2007, as award for the results obtained in optics applications.



Material witness: A quick fix, **Philip Ball**, *Nature Materials* **10**, 731 (2011) doi:10.1038/nmat3131, published by News and Views for our paper on PNAS.

National Scientific Qualification in 2012

INVITED TALKS OF PARTICULAR RELEVANCE

- Royal Institute of Technology, Stockholm, Sweden (Prof. Fredrik Laurell)
- University of Bonn, Germany (Prof. Buse)
- University of Becanson, France (Prof. Gorecki)
- University of Paderborn, Germany (Prof. Sohler)
- IIT Lecce (Prof. Gigli)
- Department DICMaPI, University “Federico II”, Napoli (Prof. Maffettone)
- CEINGE, Napoli (Prof. Iolascon)

More than 30 ‘Invited Talks’ in International Conference

**Plenary Talk** in the International Conference SPIE ‘Photonics Europe’, in ‘Hot Topics II’ (Strasburg, 2006).



## PRESS REVIEW

CNR press release regarding the article published in Advanced Materials in 2016 with the results on the electrified polymers to manipulate the soft matter. Sciences - New directions nr.33 (Gen -Feb2016). Article published by the CNR press office regarding the article published in Advanced Materials in 2016. Arpa Campania Ambiente. Article published in the nr. 28/02/2015 of the magazine regarding the sensor developed as part of the FIFB project mentioned above.

Radio interview in the "Eureka" transmission with national diffusion regarding the gluten sensor published on Nature Nanotechnology.

Interview on the radio in the transmission "Genetica Oggi" with national diffusion regarding the Gluten sensor published on Nature Nanotechnology.

Paper on the magazine Il Mattino regarding the European project "Real 3D".

Interviews released to different radio and newspapers regarding the European Project "SensApp":

- Viveresani
- Quotidiano del Sud
- Donatori H24
- Galileo Net
- Sole 24h
- Medicina Italia

## MAIN SCIENTIFIC COLLABORATIONS

University of Cambridge, United Kingdom

Vrije University of Bruxelles, Belgium

University of Linz, Austria

VTT Technical Research Centre of Finland

Policlinico Gemelli, Roma

University di Salerno

Various CNR Institutes: IMM, ISA, IBP, ICB, IPCB

University of Bari

University of Naples "Federico II"

University of Campania "L. Vanvitelli"

Italian Institute of Technology (IIT)

Royal Institute of Technology of Stockholm

Institut Mines-Télécom, France

University of Urbino, Italy

## LANGUAGES

Italian (native); English good level spoken and written