

# GIOVANNI PEROTTO

Date prepared: 20/07/2022

Address: Date of birth: 08/06/1983

Place of birth:

## CURRENT POSITION

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### Researcher

Smart Materials Group; Istituto Italiano di Tecnologia

h-index: 22: >1000 citations; >50 publications; 2 patents

## ACADEMIC

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<b>ASN</b>	Abilitazione Scientifica Nazionale 02/B1	15/05/2019
<b>PhD</b>	University of Padova, ITALY, Material Science and Engineering Dissertation: <i>"Two Dimensional Self Assembly Of Nanospheres, A Versatile Method For Nanofabrication"</i> Advisor: prof. G. Mattei	March 2011
<b>MS</b>	University of Padova, ITALY, Material Science and Engineering Graduated <u>with Honors</u> Thesis: <i>"Correlation between nucleation and energy transfer on Au nanocluster on Er doped silica"</i> Advisor: prof. G. Mattei	October 2007
<b>BS</b>	University of Padova, ITALY, Material Science Graduated <u>with Honors</u> Thesis: <i>"Synthesis and characterization of ultrathin epitaxial TiOx films on Pt (111)"</i> Advisor: prof. G. A. Rizzi	September 2005

## RESEARCH EXPERIENCE

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<b>Researcher</b> , Istituto Italiano di Tecnologia, Genova, Italy	2021-Current
<ul style="list-style-type: none"><li>• Material technologies for circular economy</li><li>• Design of new bioplastics composites for advanced applications</li><li>• Development of protein-based materials</li><li>• Multi-functional nanoparticles synthesis and surface functionalization</li><li>• Student supervision</li><li>• Funding acquisition</li></ul>	
<b>INSTM Sustainability Board Member</b>	2022-Current
<ul style="list-style-type: none"><li>• Member of the Sustainability Board for the Istituto Nazionale di Scienza e Tecnologia dei Materiali</li><li>• Development of the sustainability report for the institute's activities</li></ul>	

**Postdoc Associate**, Istituto Italiano di Tecnologia, Genova, Italy 2015 - 2021

Advisor: Dr. Athanassia Athanassiou

- Material science – bioplastics from vegetable waste
- Design of new bioplastics composites for advanced applications
- Regeneration of proteins for biomedical applications
- Multi-functional nanoparticles synthesis and surface functionalization
- Characterization and modeling of materials' properties
- Student supervision

**Postdoc Associate**, Tufts University, Medford, MA 2012 - 2015

Advisor: prof. Fiorenzo Omenetto

- Material science - Biomaterials
- Design of material properties for advanced applications
- Nanofabrication of biomaterials
- Multi-functional nanoparticles synthesis and surface functionalization
- Characterization and modeling of materials' properties
- Student supervision

**Postgraduate Fellow**, University of Padova 2011

Advisor: prof. Giovanni Mattei

- Development of new nanofabrication methods
- Design of plasmonic platforms for sensing and biosensing

**Consulting**, Pietro Fiorentini s.p.a. 12/2009 to 07/2010

Position: Material specialist

- Materials-related problem solving
- Failure Analysis
- Process Engineering
- Quality and acceptance tests design

## TEACHING EXPERIENCE

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**University of Genova**, Genova 2018-2023

- Polymers for sustainability, food packaging and biomedics (6 CFU) / SSD ING-IND 22

**Institute for Advanced Architecture of Cataluña** 2017-2019

**Guest Faculty**, Master in Advanced Architecture

- Basics teaching of material science and engineering
- Integration of novel materials in architecture
- Supervision of students

**University of Padova**, Padova 2010

**Assistant teacher**, Department of Physics

- Laboratory of Physics I for Mechanical Engineers
- classical mechanics, error theory
- Coordinated laboratory experiments and grading with a team of 2 teaching assistants

**University of Padova, Padova**

2009

**Assistant teacher**, Department of Physics

- Solid State Physics for Material Engineering
- Basic Spectroscopy theory and of laboratory experiments
- Developing course materials, lecturing and design of experiments
- Coordinated grading with a team of 4 teaching assistants

### **Students Advised**

Marta Fadda, PhD student	current
Davide Sangaletti, PhD student	current
Dagmara Trojanowska, PhD student	current
Benedetta Rotondo, Master student - Politecnico di Milano	current
Cristina Oldani, Master Student - Politecnico di Milano	2021
Gaia Arrighi, Master Student – Università di Genova	2021
Federica Anselmo, Master Student – Università di Genova	2021
Giovanni Cipri, Master Thesis, Politecnico di Torino	2020
Giulio Saroglia, Master Thesis, IIT-Politecnico di Milano	2019
Cataldo Pignatelli, <i>PhD thesis</i> , IIT	2018
Chiara Setti, <i>Master Thesis</i> , IIT	2016
Michael Weinstein, <i>Master Thesis</i> , Tufts University	2015
Samuel Hansen, <i>Undergraduate Honor Thesis</i> , Tufts University	2014
Martina Righela, <i>Master Thesis</i> , University of Padova	2011
Andrea Vigolo, <i>Undergraduate Thesis</i> , University of Padova	2011
Chiara Brugnerotto, <i>Master Thesis</i> , University of Padova	2010

### **RESEARCH PROJECTS**

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***COMPLETE (MSCA-ITN-2015-ETN Marie Skłodowska-Curie Innovative Training Networks (ITN-ETN), Project Number 675675) 2018-2021***

Responsible for the activities carried out in IIT.  
IIT's role in the project is on the development of biodegradable devices.

***PROTHEIFORM – Fondazione Cariplo (project number 2018-1005) 2019-2022***

Scientific responsible for the IIT unit, responsible for the dissemination of the project.  
Project Budget: 282316 €  
This proposal aims to develop material technologies for upcycling of keratin-rich waste into materials for packaging.

***FishSkin – H2020-MSCA-RISE-2018 2020-2023***

Scientific responsible for the IIT unit  
This proposal aims to upgrade fish skin of the fish industry into materials fashion.  
IIT role in the project will be developing new technologies for material processing and coating technologies to provide new smart functionalities to the tanned skins.

## PUBLICATIONS

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### *Journal Publications*

More than 40 papers, with more than 1000 citations and h-index of 22, as reported by google scholar

Trojanowska D. J., Suarato G., Braccia C., Armirotti A., Fiorentini F., Athanassiou A., **Perotto G.** "Wool Keratin Nanoparticle-Based Micropatterns for Cellular Guidance Applications", ACS Applied Nano Materials **2022**

Gallo M., Arrighi G., Moreschi L., Del Borghi A., Athanassiou A., **Perotto G.**, "Life Cycle Assessment of a Circular Economy Process for Tray Production via Water-Based Upcycling of Vegetable Waste", ACS Sustainable Chemistry & Engineering, **2022** †

Trojanowska D.J., Suarato G., Braccia C., Armirotti A., Fiorentini F., Athanassiou A., **Perotto G.**, "Wool Keratin Nanoparticle-Based Micropatterns for Cellular Guidance Applications", ACS Applied Nano Materials, **2022**

Quilez-Molina A. I., Mazzon G., Athanassiou A., **Perotto G.**, "A Novel Approach to Fabricate Edible and Heat Sealable Bio-based Films from Vegetable Biomass Rich in Pectin", Materials Today Communications, **2022**

Merino D., Quilez-Molina A. I., **Perotto G.**, Bassani A., Spigno G., Athanassiou A., "A second life for fruit and vegetable waste: A review on bioplastic films and coatings for potential food protection applications", Green Chemistry, **2022**

Fiorentini C., Bassani A., Duserm Garrido G., Merino D., **Perotto G.**, Athanassiou A.; Peräntie J., Halonen N., Spigno G., "High-pressure autohydrolysis process of wheat straw for cellulose recovery and subsequent use in PBAT composites preparation", Biocatalysis and Agricultural Biotechnology, **2022**

Annesi F., Pane A., Pezzi L., Pagliusi P., Losso M. A., Stamile B., Quattieri A., Desiderio G., Contardi M., Athanassiou A., **Perotto G.**, De Sio L., "Biocompatible and biomimetic keratin capped Au nanoparticles enable the inactivation of mesophilic bacteria via photo-thermal therapy", Colloids and Surfaces A: Physicochemical and Engineering Aspects, **2021**

Zych A., **Perotto G.**, Trojanowska D., Tedeschi G., Bertolacci L., Francini N., Athanassiou A., "Super Tough Polylactic Acid Plasticized with Epoxidized Soybean Oil Methyl Ester for Flexible Food Packaging", ACS Applied Polymer Materials, **2021**

Kim, M., Alfano, A., **Perotto, G.**, Serri, M., Dengo, N., Mezzetti, A., Gross, S., Prato, M., Salerno, M., Rizzo, A., Sorrentino, R., Cescon, E., Meneghesso, G., Di Fonzo, F., Petrozza, A., Gatti, T., Lamberti, F. "Moisture resistance in perovskite solar cells attributed to a water-splitting layer." Communications Materials, **2021**.

Guglielmelli, A., Rosa, P., Contardi, M., Prato, M., Mangino, G., Miglietta, S., Petrozza, V., Pani, R., Calogero, A., Athanassiou, A., **Perotto, G.**, De Sio, L. "Biomimetic keratin gold

nanoparticle-mediated in vitro photothermal therapy on glioblastoma multiforme.” *Nanomedicine*, **2020**.

Suarato G., Contardi M., **Perotto G.**, Heredia-Guerrero J. A., Fiorentini F., Ceseracciu L., Pignatelli C., Debellis D., Bertorelli R., Athanassiou A. “From fabric to tissue: Recovered wool keratin/polyvinylpyrrolidone biocomposite fibers as artificial scaffold platform”, *Materials Science and Engineering: C*, **2020**

**Perotto G.**, Simonutti R., Ceseracciu L., Mauri M., Besghini D., Athanassiou A., “*Water-induced plasticization in vegetable-based bioplastic films: A structural and thermo-mechanical study*”, *Polymer*, **2020**

Tessa, C., B., **Perotto, G.**, Musacchio C., Merlone, A., Athanassiou, A., Tordella, D., “Evaluation of Mater Bi and Polylactic Acid as materials for biodegradable innovative mini-radiosondes to track small scale fluctuations within clouds”, *Materials Chemistry and Physics*, **2020**

Cataldi P., Condurache O., Spirito D., Krahne R., Bayer I.S., Athanassiou A. **Perotto G.** “*Keratin-Graphene Nanocomposite: Transformation of Waste Wool in Electronic Devices*”, *ACS Sustainable Chemistry & Engineering*, **2019**

**Perotto G.**, Sandri G., Pignatelli C., Milanese G., Athanassiou A. “*All-water synthesis of keratin micro-nano particles with tunable mucoadhesive properties for drug delivery*”, *Journal of Materials Chemistry B*, **2019 †**

van Uden S., Catto V., **Perotto G.**, Athanassiou A., Redaelli A. CL., Greco F. G., Riboldi S. A., “*Electrospun fibroin/polyurethane hybrid meshes: Manufacturing, characterization, and potentialities as substrates for haemodialysis arteriovenous grafts*” *Journal of Biomedical Materials Research Part B: Applied Biomaterials*, **2019**

Colusso E., Vitiello D., **Perotto G.**, Valotto G., Cattaruzza E., Martucci A., “*Functionalization of Titanates–Silk Nanocomposites via Cation Exchange for Optical Applications*” *Advanced Materials Interfaces*, **2018**

Cataldi P., Heredia-Guerrero J. A., Guzman-Puyol S., Ceseracciu L., La Notte L., Reale A., Ren J., Zhang Y., Liu L., Miscuglio M., Savi P., Piazza S., Duocastella M., **Perotto G.**, Athanassiou A., Bayer I. S. “*Sustainable Electronics Based on Crop Plant Extracts and Graphene: A “Bioadvantaged” Approach*” *Advanced Sustainable Systems*, **2018**

Cesca T., **Perotto G.**, Pellegrini G., Michieli N., Kalinic B., Mattei G., “*Rare-earth fluorescence thermometry of laser-induced plasmon heating in silver nanoparticles arrays*” *Scientific Reports*, **2018**

Setti S., Suarato G., **Perotto G.**, Athanassiou A., Bayer I. S., “*Investigation of in vitro hydrophilic and hydrophobic dual drug release from polymeric films produced by sodium alginate-MaterBi® drying emulsions*” *European Journal of Pharmaceutics and Biopharmaceutics*, **2018**

Pignatelli C.,\* **Perotto G.**,\* Nardini M., Cancedda R., Mastrogiacomo M., Athanassiou A. *“Electrospun silk fibroin fibers for storage and controlled release of human platelet lysate”* Acta Biomaterialia, **2018**

**Perotto G.**, Ceseracciu L, Simonutti R, Paul UC, Guzman-Puyol S, Tran TN, Bayer IS, Athanassiou A. *“Bioplastics from vegetable waste via an eco-friendly water-based process.”* Green Chemistry. **2018**

Magrì, D., Caputo, G., **Perotto, G.**, Scarpellini, A., Colusso, E., Drago, F., Martucci, A., Athanassiou, A. and Fragouli, D., *“Titanate Fibroin Nanocomposites: A Novel Approach for the Removal of Heavy-Metal Ions from water.”* ACS applied materials & interfaces. **2017**

Genovese ME, Caputo G, Nanni G, Setti C, Bustreo M, **Perotto G.**, Athanassiou A, Fragouli D. *“Light Responsive Silk Nanofibers: An Optochemical Platform for Environmental Applications.”* ACS applied materials & interfaces. **2017**

**Perotto G.**, Zhang Y., Naskar D., Patel N., Kaplan D.L., Kundu S.C., Omenetto F.G., *“The optical properties of regenerated silk fibroin films obtained from different sources.”* Applied Physics Letters. **2017**

Palermo G, Barberi L, **Perotto G.**, Caputo R, De Sio L, Umeton C, Omenetto FG., *“A conformal silk-azobenzene composite for optically switchable diffractive structures.”* ACS Applied Materials & Interfaces, **2017**

Colusso E., **Perotto G.**, Wang Y., Sturaro M., Omenetto F. G., Martucci A., *“Bio inspired stimuli-responsive multilayer film made of silk-titanates nanocomposite”* Journal of Materials Chemistry C, **2017**,

Marelli B., Patel N., Duggan T., **Perotto G.**, Shirman E., Li C., Kaplan D.L., Omenetto F. G., *“Programming function into mechanical forms by directed assembly of silk bulk materials”* Proceedings of the National Academy of Sciences, **2016**,

Tseng P. \*, **Perotto G.** \*, Napier B., Riahi P., Li W., Shirman E., Kaplan D. L., Omenetto F. G., *“Silk Fibroin-Carbon Nanotube Composite Electrodes for Flexible Biocatalytic Fuel Cells”* Advanced Electronic Materials **2016** (8), 1

Mitropoulos A.N., Marelli B., **Perotto G.**, Amsden J., Kaplan D. L., Omenetto F. G., *“Towards the fabrication of biohybrid silk fibroin materials: entrapment and preservation of chloroplast organelles in silk fibroin films”* RSC Advances, **2016** 6 (76)

Applegate M. B., **Perotto G.**, Kaplan D. L., Omenetto F. G., *“Biocompatible silk step-index optical waveguides”* Biomedical optics express, **2015** 6 (11)

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\*: shared credits

†: journal cover

Maurizio C., Cesca T., **Perotto G.**, Kalinic B., Michieli N., Scian C., Joly Y., Battaglin G., Mazzoldi P., Mattei G. *“Core-shell-like Au sub-nanometer clusters in Er-implanted silica”* *Nanoscale* **2015** 7 (19)

Mitropoulos A. N. \*, **Perotto G\***, Kim S., Kaplan D. L., Omenetto F. G., *“Synthesis of silk fibroin micro- and nanospheres using a co-flow capillary device”*, *Advanced Materials*, **2014**, 26 (7)

**Perotto G.**, Antonello A., Ferraro D., Mattei G., Martucci A. *“Patterned TiO<sub>2</sub> nanostructures fabricated with a novel inorganic resist”*, *Materials Chemistry and Physics*, **2013**, 142

Jin J., Hassanzadeh P., **Perotto G.**, Sun W., Brenckle M. A., Kaplan D., Omenetto F. G., Rolandi M., *“A Biomimetic Composite from Solution Self-Assembly of Chitin Nanofibers in a Silk Fibroin Matrix”*, *Advanced Materials*, **2013**, 32

Antonello A., Jia B., He Z., Buso D., **Perotto G.**, Brigo L., Brusatin G., Guglielmi M., Gu M., Martucci A., *“Optimized Electroless Silver Coating for Optical and Plasmonic Applications”*, *Plasmonics*, **2012**, 7

Cesca T., Maurizio C., Kalinic, B. **Perotto, G.**, Mazzoldi P., Trave E., Battaglin G., Mattei G., *“Implantation damage effects on the Er<sup>3+</sup> luminescence in silica”*, *Optics Express*, **2012**, 20

Della Gaspera E., Guglielmi M., **Perotto G.**, Agnoli S., Granozzi G., Post M. L., Martucci A., *“CO optical sensing properties of nanocrystalline ZnO-Au films: Effect of doping with transition metal ions”*, *Sensors and Actuators B-Chemical*, **2012**, 161

Maurizio C., Trave E., **Perotto, G.**, Bello V., Pasqualini D., Mazzoldi P., Battaglin G., Cesca T., Scian C., Mattei G., *“Enhancement of the Er<sup>3+</sup> luminescence in Er-doped silica by few-atom metal aggregates”*, *Physical Review B*, **2011**, 83

**Perotto G.**, Bello V., Cesca T., Mattei G., Mazzoldi P., Pellegrini G., Scian C., *“Nanopatterning of silica with mask-assisted ion implantation”*, *Nuclear Instruments & Methods in Physics Research B*, **2010**, 268

Antonello A., Brusatin G., Guglielmi M., Bello V., **Perotto G.**, Mattei G., Maiwald M., Zöllmer V., Chiasera A., Ferrari M., Martucci A., *“Novel multifunctional nanocomposites from titanate nanosheets and semiconductor quantum dots,”* *Optical Materials*, **2010**, 33

Maurizio C., **Perotto G.**, Mattei G., Trave E., Mazzoldi P., *“Er site in Er plus Au-implanted SiO<sub>2</sub>: Effect of annealing in reducing atmosphere”*, *Nuclear Instruments & Methods in Physics Research B*, **2010**, 268

Pellegrini G., **Perotto G.**, Bello V., Mattei G., Mazzoldi P., *“Plasmonic Nanoshell Antennas for Enhanced Sensing Bio-Labeling”*, *AIP Conference Proceedings*, **2010**, 1275

#### **Book Chapter**

Simonutti, R., **Perotto, G.**, Bertolacci, L., Athanassiou, A., *“Bioplastics from Vegetable Waste: A Versatile Platform for the Fabrication of Polymer Films”*, published in *Sustainability &*

### **Patents**

Omenetto F. G., **Perotto G.**, Marelli B., Kaplan D., Mitropoulos A. N., “SYNTHESIS OF SILK FIBROIN MICRO- AND SUBMICRON SPHERES USING A CO-FLOW METHOD” 0160215103 United States Patent Application

**Perotto G.**, Bayer I., Athanasiou A., “PROCESSO A BASE ACQUOSA PER PRODUZIONE FILM BIOPLASTICI”, 102017000004597, Italian Patent granted

**Perotto G.**, Fadda M., Zych A., Athanassia A. “METODO PER PRODURRE UN RIVESTIMENTO DI UN SUBSTRATO E MATERIALE COMPOSITO COMPRENDE TALE RIVESTIMENTO”, Italian Patent Application

### **Conference & workshops**

**Perotto G.**, Materials from vegetable biomass as moldable biocomposites, Polymers in Salina 2022

#### **Symposium Organizer MSE Conference 2022, Circular Materials**

**Perotto G.**, Valorization of Vegetable Biomass as Moldable Biocomposites, MRS Spring 2022

**Perotto G.**, Biomimetic Functionalization of Gold Nanoparticles and Nanopyramids with Keratin, MRS Spring 2022

**Perotto G.**, Keratin-based electronic devices, 2022 KPS Spring Meeting, Korean Physical Society, (*invited talk*)

**Perotto G.**, Upscaling vegetable biopolymers with water-based methods into materials for packaging, Merck Young Chemist Symposium, Rimini, Italy, 2021 (*plenary talk*)

**Perotto G.**, Contardi M., Guglielmelli A., Athanassiou A., De Sio L., Biomimetic functionalization of gold nanoparticles with keratin, BioMAT 2021, Virtual conference of German Society for Materials (DGM)

**Perotto G.**, Pignatelli, C., Sandri, G., Athanassiou, A., *Keratin particles with tunable mucoadhesion properties*, Thermec 2021, 2021, Gratz, Austria (*invited talk*)

**Perotto G.**, Cataldi, P., Spirito, D., Athanassiou, A., *Keratin-based electronic devices*, Nature Inspires Creativity Engineers, 2020, Nice, France

**Perotto G.**, Simonutti, R., Bayer, I., Athanassiou, A., *Complete conversion of vegetable powder in moldable bioplastic films*, Nature Inspires Creativity Engineers, 2020, Nice, France



**Perotto G.**, Cataldi, P., Bayer, I., Athanassiou, A., *Protein-based electronics*, European MRS Spring meeting, 2019, Nice, France

**Perotto G.**, Simonutti, R., Bayer, I., Athanassiou, A., *Conversion of vegetable biomass from food processing into bioplastic films with a water based process*, European MRS Spring meeting, 2019, Nice, France

**Perotto G.**, Pignatelli C., Nardini M., Cancedda R., Mastrogiacomo M., Athanassiou A., *Silk nano materials for controlled drug release*, 1st International Conference on Materials Mimicking, Manufacturing - BioM&M, 2018, Italy.

**Perotto G.**, Colusso E., Magrì D., Omenetto F., Fragouli D., Martucci A., Athanassiou A., *Silk Fibroin and 2D Titanate Nanocomposites for Biopolymer-Based Optical and Environmental Devices*, MRS Boston, 2017

**Perotto G.**, Ceseracciu L, Simonutti R., Paul U. C., Guzman-Puyol S., Tran T. N., Bayer I. S., Athanassiou A., *A water based process to convert vegetable biomass into bioplastic films*, MRS Boston 2017

**Perotto G.**, Avellini T., Polovitsyn A., Moreels I., Pellegrini T., Athanassiou A., *Wool Keratin, multifunctional proteins for multifunctional materials*, N.I.C.E. conference, Nice (France) 19 Oct 2016

**Perotto G.**, Pignatelli C., Nardini M., Mastrogiacomo M., Cancedda R., Athanassiou A. *Protein materials as drug delivery platforms*, UK biomedical society, London (UK) 2016

**Perotto G.**, Pignatelli C., Polovitsyn A., Moreels I., Athanassiou A., *Wool keratin, a protein for multifunctional materials*, MSE conference, Darmstad (Germany) 27 Sept 2016

**Perotto G.**, Kim S., Kainerstorfer J., Tao H., Yang M., Brenckle M., Kaplan D. L., Martucci A., Omenetto F. G., *Silk-based optics, controlling the refractive index of silk fibroin*, 11th Mediterranean Workshop and Topical Meeting "Novel Optical Materials and Applications" – NOMA June 10 - 15 2013

**Perotto G.**, Mitropoulos A. N., Kim S., Calabrese R., Kaplan D. L., Omenetto F. G., *"Synthesis of Bioactive Silk Fibroin Nanoparticles"*, MRS, Nov. 25-30, 2012

Mitropoulos A. N., **Perotto G.**, Kaplan D. L., Omenetto F. G., *"Surface Wettability Characteristics of PDMS for formation of Silk Fibroin Nano and Micro Particles,"* MRS, Nov. 25-30, 2012

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## PROFESSIONAL TRAINING

**European School on Nanoscience and Nanotechnology**  
Grenoble (FR), September 2008

**European Synchrotron Radiation Facility,**  
Internship on X-ray absorption spectroscopy, 03/2007 – 04/2007

#### LANGUAGES

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**Italian:** Native Language  
**English:** Fluent  
**French:** Novice

#### COMPUTER SKILLS

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**Applications:** Latex, Origin Pro, Office,  
**Platforms:** Windows

#### EXPERIMENTAL SKILLS

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**Project Management:** management of project with interdisciplinary team, problem solving, coordination of research team and coordination with industrial partners, grant writing

**Communication:** TEDx Genova 2019 speaker, proficient in communication of scientific results to a scientific and non scientific audience.

**Planning:** Experienced in working on long demanding projects that require organizational and planning skills. Ability to perform well under pressure and with tight schedules.

**Relationship:** Talented at building effective, productive working relationships with team members. Comfortable in living and working in multilingual and multicultural environments.

**Synthesis:** skilled in colloidal chemistry, including synthesis of noble metal nanoparticles, oxide nanoparticles, silk fibroin particles, silk fibroin chemistry, biomaterials processing, nanocomposites

**Characterization:** ability in materials characterization, including UV-Visible Spectroscopy, Photoluminescence Spectroscopy, AFM, SEM, TEM, ellipsometry, X-ray Absorption Spectroscopy, XPS, electrochemistry, structure-to-property relationship.

**Nanofabrication:** experienced in self assembly of SiO<sub>2</sub>, PS nanoparticles and diblock copolymer. Experienced in the synthesis of nanostructured and patterned substrates via soft lithographic, UV lithography. Microfluidic synthesis of micro- and nano- particles.

#### REFERENCES

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**Athanassia Athanassiou**  
Italian Institute of Technology,  
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