

# GIOVANNI MARIA VANACORE



## PERSONAL DETAILS

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*Nationality:* Italian

*Date and place of birth:* November 27th 1983, Milano (Italy)

*Work address:* Department of Materials Science, University of Milano-Bicocca,  
Via Cozzi 55, 20125 Milano (Italy).

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## PROFESSIONAL EXPERIENCES

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### **Associate Professor of Physics – Department of Materials Science, University of Milano-Bicocca (Italy)**

*Period:* December 2022 – present

Principal Investigator of the ‘Laboratory of Ultrafast Microscopy for Nanoscale Dynamics’ (LUMiNaD). Scientific Coordinator of the EU-funded FET-Open project SMART-electron (GA n. 964591) – [www.smartelectron.eu](http://www.smartelectron.eu).

### **Assistant Professor of Physics – Department of Materials Science, University of Milano-Bicocca (Italy)**

*Period:* December 2019 – November 2022

Principal Investigator of the ‘Laboratory of Ultrafast Microscopy for Nanoscale Dynamics’ (LUMiNaD). Scientific Coordinator of the EU-funded FET-Open project SMART-electron (GA n. 964591) – [www.smartelectron.eu](http://www.smartelectron.eu).

### **Scientist – École Polytechnique Fédérale de Lausanne (Switzerland)**

*Period:* February 2016 – November 2019; *Advisor:* Prof. Fabrizio Carbone.

Ultrafast electron diffraction, microscopy and spectroscopy experiments performed in the LUMES laboratory. The appointment was partially supported by the EPFL Fellowship program co-founded by Marie Skłodowska-Curie (H2020 – MSCA – COFUND 2016, GA n. 665667).

### **Post-doctoral Research Scholar – California Institute of Technology (U.S.A.)**

*Period:* November 2011 – January 2016; *Advisor:* Prof. Ahmed H. Zewail (Nobel Laureate in Chemistry - 1999).

The research activity was focused on the investigation of the nature of atomic-scale ultrafast phenomena in nanomaterials.

### **M.Sc. internship at the French Atomic Energy Commission, CEA-Saclay (France)**

*Period:* March 2007 – September 2007; *Advisor:* Dr. Nicholas Barrett.

Investigation of surface properties of correlated perovskite materials. My appointment was supported within the framework of the FP6 INCEMS European project.

## TEACHING EXPERIENCES

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### **Teaching @ University of Milano-Bicocca (Italy)**

*Period:* March 2020 – present.

“Quantum Materials Synthesis” (code: F5302Q036). Master course. Fall of 2022 and Spring of 2023.

“Quantum Electronics” (code: F5302Q035). Master course. Fall of 2022 and 2023.

“Laboratory of Physics II” (code: E2701Q042). Bachelor course. Spring of 2020, 2021, 2022 and 2023.

“Physical Characterization of Materials With Laboratory” (code: F5302Q005). Master course. Spring of 2021, 2022 and 2023.

“Principles of Electron Microscopy and Applications to Nanomaterials Research” (code: 79R-Mod7). Doctoral course, Spring of 2021, 2022 and 2023.

**Teaching @ École Polytechnique Fédérale de Lausanne (Switzerland)**

Period: March 2016 – November 2019.

"Physique Generale II" (code: PHYS-106(a)). Spring of 2016, 2017 and 2018. Instructor: Prof. Fabrizio Carbone.

"Solid State Physics I" (code: PHYS-309). Fall of 2018. Instructor: Prof. Henrik Rønnow.

"Physique Generale I" (code: UNIL-112). Spring of 2019. Instructor: Prof. Fabrizio Carbone.

**Teaching @ California Institute of Technology (U.S.A.)**

Period: March 2015 – June 2015.

"Dynamics and Complexity in Physical and Life Sciences" (code: Ch 228). Spring of 2015. Instructor: Prof. Ahmed H. Zewail.

**Teaching @ Politecnico di Milano (Italy)**

Period: March 2008 – September 2011.

"Fundamentals of Experimental Physics" (code: 081389, 12 credits, spring of 2009). Instructor: Prof. A Tagliaferri.

"Fundamentals of Thermodynamics and Acoustics" (code: 085646, 5 credits, spring of 2011). Instructor: Prof. A. Tagliaferri.

**EDUCATION**

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**Ph.D. in Physics (Italian/French joint degree)**

**Politecnico di Milano (Italy) - École Polytechnique X (France) - CEA-Saclay (France)**

Period: January 2008 – October 2011.

Advisors: Prof. Alberto Tagliaferri, Dr. Nicholas Barrett, Prof. Henri-Jean Drouhin.

Investigation of electronic and structural properties of semiconductor nanostructures for optoelectronics applications using spectro-microscopy techniques.

Thesis title: Investigation of Ge Surface Diffusion and SiGe Nanostructures by Spectro-microscopy Techniques.

Final grade: "avec mention très honorable".

**M.Sc. in Physics Engineering – Politecnico di Milano (Italy)**

Period: September 2005 – December 2007.

Major in Photonics and Nanotechnology. Final grade: 110/110 magna cum laude.

**Alta Scuola Politecnica (ASP), Politecnico di Milano and Politecnico di Torino (Italy)**

Period: September 2005 – February 2008.

Diploma in Management of Innovation.

**M.Sc. in Mathematics Engineering – Politecnico di Torino (Italy)**

This degree has been obtained thanks to the successful completion of the ASP program.

**B.Sc. in Physics Engineering – Politecnico di Milano (Italy)**

Period: September 2002 – July 2005.

Major in laser physics and condensed matter physics. Final grade: 110/110 magna cum laude.

**Scientific High School Diploma – Angri, Salerno (Italy)**

Period: September 1997 – July 2002.

Final grade: 100/100.

**SCIENTIFIC RESULTS AND REVIEWING ACTIVITIES**

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- Author and co-author of 52 scientific publications and 1 book chapter.
- Hirsch (h)-index: 19 (from Scopus).

- Reviewer activity for the following journals: *Science Advances*, *Physical Review Letters*, *Physical Review B*, *Nano Letters*, *ACS Photonics*, *Chemical Physics Letters*, *New Journal of Physics*, *Phys. Chem. Chem. Phys.*, *Structural Dynamics*, *Ultramicroscopy*, *Advances in Physics: X*, *Physica Status Solidi (Rapid Research Letters)*.
- Review panel member for student admission to the Bachelor of Science in Materials Science, University of Milano-Bicocca, Italy.
- Review panel member for student admission to the PhD program in Materials Science and Nanotechnology, University of Milano-Bicocca, Italy.
- International evaluator for the “Émergence Call for Proposals 2021-2022”, Sorbonne University, France.
- International evaluator for the “VENI research programme 2021” of the Dutch Research Council, The Netherlands.

## **INSTITUTIONAL RESPONSABILITIES**

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- Faculty member, Department of Materials Science, University of Milano-Bicocca, Italy (Period: 2019 – present).
- Member of the Managing Committee of the Microscopy Platform; Materials Science advisor and Electron Microscopy specialist, University of Milano-Bicocca, Italy (Period: 2019 – present).
- Member of the Erasmus Committee; Materials Science advisor, University of Milano-Bicocca, Italy (period: 2020 – present).
- Member of the Orientation Committee; Materials Science advisor, University of Milano-Bicocca, Italy (Period: 2020 – present).

## **MEMBERSHIP OF SCIENTIFIC SOCIETIES**

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2018 – present. Member of the American Chemical Society (ACS) – member n. 31011858.

2021 – present. Member of the American Physical Society (APS) – member n. 62074153.

2021 – present. Member of the Materials Research Society (MRS).

## **TECHNICAL SKILLS**

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- Ultrafast Electron Diffraction (UED), Ultrafast Electron Microscopy (UEM) and Ultrafast Electron Energy-Loss Spectroscopy (Femto-EELS).
- Femtosecond Lasers and Non-linear Optics.
- Transmission electron microscopy (TEM), Scanning electron microscopy (SEM) and Scanning Auger Microscopy (SAM).
- Angle-resolved Photoemission (ARPES) and Photo-electron emission microscopy (PEEM).
- Scanning probe microscopies (AFM and STM).
- Optical microscopy and Raman spectroscopy.
- *Softwares and Programming Languages*: Matlab, Mathematica, Solidworks, Simlon, Comsol, OpenFOAM, Abinit, C/C++, LabView.

## **LANGUAGES**

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- **Italian**: native language
- **English**: fluent, working language.
- **French**: fluent, working language.

## **FELLOWSHIPS, GRANTS AND AWARDS**

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- *October 2023*. Unit coordinator of the PRIN2022 project entitled “*Unraveling ultrafast charge and heat pathways in twisted van der Waals heterostructures*” funded by the Italian Ministry of Education and Research for 189,988 Euro.

- *May 2021.* Scientific coordinator of the FET-OPEN project entitled “*Ultrafast all-optical spatio-temporal electron modulators: opening new frontiers in electron microscopy (SMART-electron, GA n. 964591)*” funded by the European Union for 3.042 million Euro.
- *May 2021.* Principal investigator of the BIR-2021 project entitled “*Laboratory of Ultrafast Microscopy for Nanoscale Dynamics (LUMiNaD)*” funded by the University of Milano-Bicocca for 156,000 Euro.
- *November 2018.* Accepted grant proposal as co-PI entitled “*Project Heidi: Stimulated Nuclear Excitation by Electron Capture*”. Founding source: Google Inc (final award of 400,000 USD).
- *March 2018.* Italian National Academic Qualification as Associate Professor in Experimental Physics of Matter (FIS 02/B1).
- *March 2016.* Accepted grant for the EPFL’s international postdoctoral fellowship programme co-founded by Marie Skłodowska-Curie (March 2016, H2020 – MSCA – COFUND 2016, GA n. 665667).
- *February 2016.* Accepted grant within the ACHN-2015 funding scheme of the Agence Nationale pour la Recherche (ANR), France. Awarded in February 2016 (400000 Euro), application withdrawn after winning.
- *September 2011.* Award for the “*Best oral presentation at the XCVII Conference of the Italian Physical Society*” (L’Aquila, Italy) in the Condensed Matter Physics session.
- *July 2010.* Accepted experiment proposal at the SOLEIL Synchrotron (Paris, France), entitled “*Electronic Structure of Ge nanostructures by Resonant k space-PEEM*” (experiment n. 20100485). (July 2010)
- *July 2009.* Accepted experiment proposal at the ESRF Synchrotron (Grenoble, France), entitled “*Nano-diffraction mapping and predictive modelling of the strain in single artificial SiGe nanostructures*” (experiment n. SI-1873). (July 2009)
- *January 2008.* Medal of Excellence as “*Best M.Sc. Graduate Student in Physics Engineering in 2006-2007*” at Politecnico di Milano (Italy).
- *January 2008.* Ph.D. Fellowship of the Italian Ministry of Education, University and Research. (January 2008 – February 2011).

## **SEMINARS AND TALKS AT INTERNATIONAL CONFERENCES (ONLY INVITED)**

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- Invited talk at the CMD20-FISMAT2023 conference, Milano (Italy). (September 2023)
- Invited talk at the Focus session on “*Ultrafast Dynamics in Nanostructures*” at the annual conference of the German Physical Society, Dresden (Germany). (March 2023).
- Invited seminar at the NanoLab Talk, Department of Energy at the Politecnico di Milano, Milano (Italy). (November 2022)
- Invited talk at the International Online Workshop on “*Photocathode Physics for Photoinjectors (P3)*” (SLAC). (November 2021)
- Invited talk at the focus session “*Free-electron light-matter interaction*” within the on-line international conference METANANO 2021. (September 2021)
- Invited talk at the “*NanoInnovation 2021 Conference*”, Rome (Italy). (September 2021)
- Invited talk at the International Online Conference on “*Science and Application of Coherent Electron Beam Manipulation*” (QSORT Conference-2021). (September 2021)
- Invited talk at the International Online Workshop on “*Electrons, Photons and Plasmons 2021*”. (March 2021)
- Invited colloquium at the Department of Physics of the University of Arizona (USA). (Oct. 2020)

- Invited talk at the 3rd International Workshop on "Electron Beam Spectroscopy for Nanophotonics", Paris (France). (Sept. 2019)
- Invited talk at the 14th Femtochemistry Conference – Dynamics of the Complexity in Chemistry, Biology and Physics, Shanghai (China). (August 2019)
- Invited talk at the International Conference on Quantum Imaging and Electron Beam Shaping (QSORT Conference-2019), Erlangen (Germany). (July 2019)
- Invited seminar at the New Jersey Institute of Technology (NJIT), Newark (New Jersey, USA). The seminar was part of the interview process for Assistant Professor position in Physics. (February 2019)
- Invited talk at the 9th Annual meeting of the NCCR-MUST 2019, Grindelwald (Switzerland). (Jan. 2019).
- Invited talk at the 256th meeting of the American Chemical Society (ACS) within the session "Ultrafast Molecular Sciences by Femtosecond Photons & Electrons: Symposium in honor of Ahmed Zewail", Boston (USA). (August 2018)
- Invited talk at the conference "From Solid State to Biophysics IX: From Basic to Life Sciences", Cavtat (Croatia). (June 2018)
- Invited talk at the International Conference on Electron Beam Shaping in Space and Time (QSORT Conference-2018), Jülich (Germany). (May 2018)
- Invited seminar at the University of California Irvine (UCI), Irvine (California, USA). The seminar was part of the interview process for Assistant Professor position in Physical Chemistry. (April 2018)
- Invited talk at the 4th International Conference on Ultrafast Structural Dynamics (ICUSD-2017), Trieste (Italy). (Dec. 2017)
- Invited talk at the 2nd International Workshop on "Electron Beam Spectroscopy for Nanophotonics", Barcelona (Spain). (Oct. 2017)
- Invited talk at the 6th International Workshop on "Epitaxial Growth and Fundamental Properties of Semiconductor Nanostructures", Como (Italy). (Sept. 2017)
- Invited talk at the International Conference on "Quantum physics in Complex Matter: Superconductivity, Magnetism and Ferroelectricity (Superstripes 2017)", Ischia (Italy). (June 2017)
- Invited talk at the 2017 Materials Research Society (MRS) meeting, Phoenix (United States of America). (April 2017).
- Invited talk at the 7th Annual meeting of the NCCR-MUST 2017, Grindelwald (Switzerland). (Jan. 2017).
- Invited talk at the "4th Italian Experience in Biomedical Research: Young Minds at Work", Desenzano del Garda (Italy). (Nov. 2016)
- Invited talk at the EMN Meeting on Photonics 2016, Barcelona (Spain). (Sept. 2016)
- Invited talk at the International Conference on "Quantum in Complex Matter: Superconductivity, Magnetism and Ferroelectricity (Superstripes 2016)", Ischia (Italy). (June 2016)
- Invited talk at the conference "From Solid State to Biophysics VIII: From Basic to Life Sciences", Cavtat (Croatia). (June 2016)
- Invited talk at the National Conference on Condensed Matter Physics - FisMat2013, Milano (Italy). (Sept. 2013)