

# CV of Prof. Orazio Muscato

June 20, 2021

## Education

- Master of Science in Physics *summa cum laude*, Università degli Studi di Catania (1982).
- Ph.D. in Mathematics, Università degli Studi di Palermo (1987).
- Research grant *Istituto Nazionale di Alta Matematica "F. Severi"*, Roma A.A. 1987-1988.

## Positions

- Full Professor of Mathematical Physics (SSD MAT/07), Dipartimento di Matematica e Informatica dell'Università degli Studi di Catania, current.
- Associate Professor of Mathematical Physics (SSD MAT/07), Faculty of Science Università degli Studi di Catania, 2002 - 2018.
- Assistant Professor (Ricercatore) of Mathematical Physics (SSD MAT/07), Faculty of Science Università degli Studi di Catania, 1992 - 2002.
- Teacher of Mathematics and Physics, Liceo Classico Statale annesso al Convitto Nazionale "M. Cutelli" - Catania 1988-1992.

## Abilitation

- Italian National Abilitation, Full Professor of Mathematical Physics, 3.12.2013.

## Academic Responsibilities

- Head of the Department of Mathematics and Computer Science, University of Catania, 2019 - present
- Member of the Academic Senate, University of Catania, 2019 - present

## Research Project coordinator

- Joint study project *Comparison between hydrodynamic and Monte Carlo simulation of small semiconductor devices* in collaboration with I.B.M. Corporation *J. T. Watson Research Center*, Yorktown Heights, New York (USA), 1993, 1994, 1995, 1997
- Research grant *Mathematical models for semiconductors and applications*, C.N.R. (1997).
- Research grant University of Catania (Progetto di Ricerca di Ateneo PRA) 2005, 2006, 2007, 2008, 2010 - *Mathematical models for charge transport in nanoelectronics*.
- Coordinator for the University of Catania, Research grant (Legge 297/99 - Ricerca) MIUR (2007-2009) *Advanced statistical methodologies for the tolerance analysis in the design of integrated circuits*, in collaboration with STMicroelectronics Agrate Brianza (MI) and Università degli Studi di Milano.
- Research grant *Modeling, simulation and optimization for charge transport in low dimensional structures*, Piano della Ricerca 2016-2018 (linea di intervento 2) Università degli Studi di Catania .

## Teaching activity

- Professor of *Mathematical Physics 1*, B.S. *Mathematics* (L-35), current;
- Professor of *Mathematical and Statistical Methods*, B.S. *Informatica di Primo Livello* (L-31), current.
- Scientific board member of the Ph.D. program in "Informatics" (XXXIII ciclo), University of Catania. He held courses in the Ph.D. program of University of Catania and Scuola Normale Superiore (Pisa).

During his teaching activity he held many courses in Mathematics (Mathematical Physics, Applied mathematics, Theoretical Mechanics, Mathematical models, Wave propagation, Numeric analysis, Calculus) for B.S. and M.S. programs in Mathematics, Physics, Computer Science, Architecture, Engineering.

## Scientific activity

- He has participated in several International and National Meetings and Workshops. In many of them he has been Invited Speaker.
- Visiting Professor in many research institutions, as *Courant Institute of Mathematical Sciences* New York University (USA), *J. T. Watson Research Center* I.B.M. Corporation New York (USA), *Weirstrass Institute for Applied Analysis and Stochastics* Berlin, *Institute for theoretical physics - Computational Physics* TU Graz (Austria).

## Other activities

- He belongs to the "Albo degli Esperti Disciplinari della Valutazione ANVUR", area CUN 01.
- He is member of the following scientific societies: Gruppo Nazionale per la Fisica Matematica dell' Istituto Nazionale di Alta Matematica "F. Saveri", Unione Matematica Italiana (U.M.I.), Società Italiana di Matematica Applicata ed Industriale (S.I.M.A.I.).
- Referee for many journals, among the others, *Journal of Computational Physics*, *Journal of Statistical Physics*, *Kinetic and related models*, *Physical Rev. B*, *IEEE Trans. Elec. Device*, *Int. Journal of Heat Mass Transfer*.
- He held lectures in the CLIL program (Content and Language Integrated Learning), P.A.S, T.F.A., *Piano Nazionale Lauree Scientifiche* (PNLS), Master PON. He also collaborated in activities for the promotion of mathematics in secondary schools.

## Research activity

He is author of more than 90 scientific publications, in the following subjects

- Non linear wave propagation in Relativistic Magneto fluidynamics;
- Collisionless relativistic plasma;
- Relativistic kinetic theory;
- Fluidynamics models for charge transport in semiconductors devices;
- Kinetic charge transport models in semiconductors devices;
- Electro-thermal transport models in nanometric semiconductor devices;
- Tolerance analysis in electronic devices;
- Charge transport models in low-dimensional systems;
- Monte Carlo Direct Simulation for the Wigner transport equation.
- Data analysis and big data.