EUROPEAN MEDICINES AGENCY
SCIENCE MEDICINES HEALTH

Curriculum Vitae

Personal information

Simonetta Filippi

Work experience

Academic and research positions:
(Present position) Full Professor in Theoretical Physics (FIS/02), Department of Engineering, UCBM.
Vice-Rector for Integrated Academic Development
(2008-present) Head of the Nonlinear Physics and Mathematical Modeling Unit UCBM.
(2002-2015) Associate Professor in Theoretical Physics (FIS/02), Department of Engineering, UCBM.
(2017-present) Adjunct Professor of the International Center for Relativistic Astrophysics Network (ICRANet).
(2012-present) Research Head of the I.C.R.A. (International Center for Relativistic Astrophysics)
Section @University Campus Bio-Medico of Rome.
(1999-2002) Researcher in Physics, Department of Engineering, UCBM.
(1993-1999) Adjunct Professor of Physics, Medical School, UCBM.
(1983-1996) Fellow Researcher and Lecturer on Theoretical Physics – ICRA, University
"La Sapienza" of Rome, Expert in Theoretical Physics, Department of Physics, University "La Sapienza" of Rome.
(1984-1986) Visiting researcher of the Astronomical Observatory of Capodimonte, Naples.
(1983-1984) Adjunct Professor of Physics, Faculty of Sciences, Catholic University of Brescia, Italy.

Teaching activities
(2004-present) Dynamics of Complex Systems, Master Degree in Biomedical Engineering UCBM.
(2001-2015) General Physics I, Bachelor Degree in Biomedical/Industrial Engineering UCBM.
(1999-2002) Physics. Master Degree in Medicine UCBM.
(1983-1984) General Physics II, Bachelor Degree in Mathematics, Science Faculty University “Cattolica del Sacro Cuore”, Brescia.

Students supervision and PhD Faculty Participation
Doctoral School in Science and Engineering for humans and the Environment (cycles XXXIII-XXXV)
Doctoral School in Biomedical Engineering UCBM (cycles XXIX-XXXII).
Doctoral School in Bioengineering and Biosciences UCBM (cycles XXI-XXVIII)
Doctoral School IRAP (International Relativistic Astrophysics) PhD Programme (cycles XXI-XXIX)
Member of the PhD Committee in Science, University of Nice-Sophia Antipolis (FR).
Member of the PhD Committee in Physics, Università di Trento (IT).
Advisor for 1 International IRAP PhD student in Relativistic Astrophysics.
Advisor for more than 20 students for Bachelor and Master Degrees in Industrial and Biomedical Engineering, UCBM.

Advisor for 8 PhD students in Science and Biomedical Engineering UCBM.
Advisor for 1 International PhD student in Endocrinology and Metabolic Disorders UCBM

Committee Member and Institutional Responsibilities
(2021-present) Rector Delegate for Gender Equality Plan
(2018-present) Scientific Supervisor of the “Accordo Quadro” UCBM - ICRANET
(International Center for Relativistic Astrophysics Network).
(2018-present) Scientific Supervisor of the “Accordo Quadro” UCBM - IIT
(Istituto Italiano di Tecnologia).
(2016-2018) Scientific Supervisor of the “Convenzione Scientifica” UCBM - IIT.
(2016-2020) Participant to “Commissione Didattica” CRUI.
(2015-2020) Vice-Rector for Education UCBM.
(2012-2014) Vice Dean of the Department of Engineering, UCBM.
(2003-2011) Director of Studies of the Department of Engineering, UCBM.
(2004-2009) Director of UCBM Tutoring System for the Faculty of Engineering UCBM.

Education and training

Education
Laurea Degree in Physics, University of Rome "La Sapienza," (110/110 cum laude) in 1982.

Additional information

Publications

Barone, A., Grieco, D., Gizzi, A., Molinari, L., Zaltieri, M., Massaroni, C., Loppini, A., Schena, E., Bressi, E., de Ruvo, E., Caló, L., Filippi, S.

A Simulation Study of the Effects of His Bundle Pacing in Left Bundle Branch Block: Simulation of His Bundle Pacing in Left Bundle Branch Block

(2022) 107, art. no. 103847.

Molinari, L., Zaltieri, M., Massaroni, C., Filippi, S., Gizzi, A., Schena, E.

Multiscale and Multiphysics Modeling of Anisotropic Cardiac RFCA: Experimental-Based Model Calibration via Multi-Point Temperature Measurements

(2022) 13, art. no. 845896, .

Crispino, A., Loppini, A., Uzelac, I., Fenton, F.H., Gizzi, A., Filippi, S.

Methodological analysis of dual voltage-calcium whole-heart optical signals during restitution pacing under different thermal states

(2022) .

Hörning, M., Loppini, A., Erhardt, J., Fenton, F.H., Filippi, S., Gizzi, A.

Optical Ultrastructure of Cardiac Tissue Helps to Reproduce Discordant Alternans by In Silico Data Assimilation

(2022) .

Matarrese, M.A.G., Loppini, A., Nicoletti, M., Filippi, S., Chiodo, L.

Assessment of tools for RNA secondary structure prediction and extraction: a final-user perspective

(2022) .

Luchetti, N., Chiodo, L., Loppini, A., Filippi, S.

Multiscale Modeling of Ion Channels Electrophysiology: from Atomistic Description to Whole-Cell Models

(2022) pp. 109-114.

De Micco, F., De Benedictis, A., Fineschi, V., Frati, P., Ciccozzi, M., Pecchia, L., Alloni, R., Petrosillo, N., Filippi, S., Ghilardi, G., Campanozzi, L.L., Tambone, V.

From syndemic lesson after covid-19 pandemic to a "systemic clinical risk management" proposal in the perspective of the ethics of job well done

(2022) 19 (1), art. no. 15, .

Moradi, R., Rueda, J.A., Ruffini, R., Li, L., Bianco, C.L., Campion, S., Cherubini, C., Filippi, S., Wang, Y., Xue, S.S.

Nature of the ultrarelativistic prompt emission phase of GRB 190114C

(2021) 104 (6), art. no. 063043, .

Ruffini, R., Moradi, R., Rueda, J.A., Li, L., Sahakyan, N., Chen, Y.-C., Wang, Y., Aimuratov, Y., Becerra, L., Bianco, C.L., Cherubini, C., Filippi, S., Karlica, M., Mathews, G.J., Muccino, M., Pisani, G.B., Xue, S.S.

The morphology of the X-ray afterglows and of the jetted GeV emission in long GRBs

(2021) 504 (4), pp. 5301-5326.

Portuesi, R., Loppini, A., Mancari, R., Filippi, S., Colombo, N.

Role of inhibin B in detecting recurrence of granulosa cell tumors of the ovary in postmenopausal patients

(2021) 31 (6), pp. 893-898.

Loppini, A., Barone, A., Gizzi, A., Cherubini, C., Fenton, F.H., Filippi, S.

Thermal effects on cardiac alternans onset and development: A spatiotemporal correlation analysis

(2021) 103 (4), art. no. L040201, .

Matarrese, M.A.G., Loppini, A., Jahromi, S., Tamilia, E., Fabbri, L., Madsen, J.R., Pearl, P.L., Filippi, S., Papadelis, C.

Electric Source Imaging on Intracranial EEG Localizes Spatiotemporal Propagation of Interictal Spikes in Children with Epilepsy

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Stefano, M., Cordella, F., Loppini, A., Filippi, S., Zollo, L.

A Multiscale Approach to Axon and Nerve Stimulation Modeling: A Review

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Ramírez, W.A., Gizzi, A., Sack, K.L., Filippi, S., Guccione, J.M., Hurtado, D.E.

On the role of ionic modeling on the signature of cardiac arrhythmias for healthy and diseased hearts

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Temperature effects and correlation analysis in cardiac tissue

(2020) art. no. 9158021, .

Nicoletti, M., Loppini, A., Chiodo, L., Folli, V., Ruocco, G., Filippi, S.

Mathematical modeling of the Caenorhabditis elegans RMD motor neurons

(2020) art. no. 9158182, .

Nicoletti, M., Loppini, A., Chiodo, L., Folli, V., Ruocco, G., Filippi, S.

AWC c. Elegans neuron: A biological sensor model

(2020) art. no. 9138174, pp. 329-333.

Loppini, A., Cherubini, C., Bertolaso, M., Filippi, S.

Breaking down calcium timing in heterogenous cells populations

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Key aspects for effective mathematical modelling of fractional-diffusion in cardiac electrophysiology: A quantitative study

(2020) 84, art. no. 105152, .

Ruiz-Baier, R., Gizzi, A., Loppini, A., Cherubini, C., Filippi, S.

Modelling thermo-electro-mechanical effects in orthotropic cardiac tissue

(2020) 27 (1), pp. 87-115.

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(2020) 358, art. no. 112615, .

Ruffini, R., Moradi, R., Rueda, J.A., Becerra, L., Bianco, C.L., Cherubini, C., Filippi, S., Chen, Y.C., Karlica, M., Sahakyan, N., Wang, Y., Xue, S.S.

On the GeV Emission of the Type i BdHN GRB 130427A

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Loppini, A., Gizzi, A., Cherubini, C., Cherry, E.M., Fenton, F.H., Filippi, S.

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Nicoletti, M., Loppini, A., Chiodo, L., Folli, V., Ruocco, G., Filippi, S.

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Critical transitions in heterogeneous networks: Loss of low-degree nodes as an early warning signal

(2019) 99 (4), art. no. 040301, .

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Editorial: Simulating normal and arrhythmic dynamics: From sub-cellular to tissue and organ level

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The binary progenitors of short and long GRBs and their gravitational-wave emission

(2018) 168, art. no. 01006, .

Cherubini, C., Filippi, S., Loppini, A.

Robustness and Emergent Dynamics in Noisy Biological Systems

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Loppini, A., Gizzi, A., Ruiz-Baier, R., Cherubini, C., Fenton, F.H., Filippi, S.

Competing mechanisms of stress-assisted diffusivity and stretch-activated currents in cardiac electromechanics

(2018) 9, art. no. 1714, .

Rueda, J.A., Aimuratov, Y., Barres De Almeida, U., Becerra, L., Bianco, C.L., Cherubini, C., Filippi, S., Karlica, M., Kovacevic, M., Melon Fuksman, J.D., Moradi, R., Muccino, M., Penacchioni, A.V., Pisani, G.B., Primorac, D., Ruffini, R., Sahakyan, N., Shakeri, S., Wang, Y.

The binary systems associated with short and long gamma-ray bursts and their detectability

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Cherubini, C., Filippi, S., Loppini, A.

Systems biology modeling of nonlinear cancer dynamics

(2018) 1702, pp. 203-213.

Boccia, E., Gizzi, A., Cherubini, C., Nestola, M.G.C., Filippi, S.

Viscoelastic computational modeling of the human head-neck system: Eigenfrequencies and time-dependent analysis

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Gizzi, A., Giannitelli, S.M., Trombetta, M., Cherubini, C., Filippi, S., De Ninno, A., Businaro, L., Gerardino, A., Rainer, A.

Computationally Informed Design of a Multi-Axial Actuated Microfluidic Chip Device

(2017) 7 (1), art. no. 5489, .

Cherubini, C., Filippi, S., Gizzi, A., Ruiz-Baier, R.

A note on stress-driven anisotropic diffusion and its role in active deformable media

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Loppini, A., Pedersen, M.G., Braun, M., Filippi, S.

Gap-junction coupling and ATP-sensitive potassium channels in human β -cell clusters: Effects on emergent dynamics

(2017) 96 (3), art. no. 032403, .

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Nonlinear diffusion and thermo-electric coupling in a two-variable model of cardiac action potential

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The binary systems associated with short and long gamma-ray bursts and their detectability

(2017) 26 (9), art. no. 1730016, .

Cipolletta, F., Cherubini, C., Filippi, S., Rueda, J.A., Ruffini, R.

Last stable orbit around rapidly rotating neutron stars

(2017) 96 (2), art. no. 024046, .

Gizzi, A., Loppini, A., Cherry, E.M., Cherubini, C., Fenton, F.H., Filippi, S.

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(2017) 38 (5), pp. 833-847.

Nestola, M.G.C., Faggiano, E., Vergara, C., Lancellotti, R.M., Ippolito, S., Antona, C., Filippi, S., Quarteroni, A., Scrofani, R.

Computational comparison of aortic root stresses in presence of stentless and stented aortic valve bio-prostheses

(2017) 20 (2), pp. 171-181.

Cherubini, C., Filippi, S.

The hamiltonian field theory of the von mises wave equation: Analytical and computational issues

(2016) 19 (3), pp. 758-769.

Nestola, M.G.C., Gizzi, A., Cherubini, C., Filippi, S.

Three-band decomposition analysis in multiscale FSI models of abdominal aortic aneurysms

(2016) 27 (2), art. no. 1650017, .

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Physics and astrophysics of neutron stars

(2015) 1693, art. no. 030001, .

Gizzi, A., Cherubini, C., Filippi, S., Pandolfi, A.

Theoretical and numerical modeling of nonlinear electromechanics with applications to biological active media

(2015) 17 (1), pp. 93-126.

Nestola, M.G.C., Gizzi, A., Cherubini, C., Filippi, S., Succi, S.

Novel risk predictor for thrombus deposition in abdominal aortic aneurysms

(2015) 112 (2), art. no. 28001, .

Cherubini, C., Filippi, S., Gizzi, A., Loppini, A.

Role of topology in complex functional networks of beta cells

(2015) 92 (4), art. no. 042702, .

Loppini, A., Braun, M., Filippi, S., Morten Gram Pedersen
Mathematical modeling of gap junction coupling and electrical activity in human β-cells
(2015) 12 (6), art. no. 066002, .

Cipolletta, F., Cherubini, C., Filippi, S., Rueda, J.A., Ruffini, R.
Fast rotating neutron stars with realistic nuclear matter equation of state
(2015) 92 (2), art. no. 023007, .

Bertolaso, M., Capolupo, A., Cherubini, C., Filippi, S., Gizzi, A., Loppini, A., Vitiello, G.
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Dupraz, M., Filippi, S., Gizzi, A., Quarteroni, A., Ruiz-Baier, R.
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(2015) 38 (6), pp. 1046-1058.

Cherubini, C., Filippi, S., Gizzi, A., Nestola, M.G.C.
On the wall shear stress gradient in fluid dynamics
(2015) 17 (3), pp. 808-821.

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(2015) 0, pp. 2475-2477.

Cherubini, C., Filippi, S.
On the relation of von mises equation with acoustic black holes
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Gizzi, A., Ruiz-Baier, R., Rossi, S., Laadhari, A., Cherubini, C., Filippi, S.
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(2015) 14, pp. 157-176.

Loppini, A., Capolupo, A., Cherubini, C., Gizzi, A., Bertolaso, M., Filippi, S., Vitiello, G.
On the coherent behavior of pancreatic beta cell clusters
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Role of temperature on nonlinear cardiac dynamics

(2013) 87 (4), art. no. 042717, .

Cherubini, C., Filippi, S.

Classical field theory of the von Mises equation for irrotational polytropic inviscid fluids

(2013) 46 (11), art. no. 115501, .

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A stochastic mathematical model to study the autoimmune progression towards type 1 diabetes

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(2011) 84 (12), art. no. 124010, .

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Acoustic metric of the compressible draining bathtub
(2011) 84 (8), art. no. 084027, .

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(2010) 82 (4), art. no. 044005, .

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(2010) 56 (51), pp. 1668-1672.

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(2010) 81 (1), art. no. 010901, .

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(2010) 7 (1), art. no. 016011, .

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(2009) 42 (4), pp. 2057-2066.

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(2009) 41 (12), pp. 2781-2795.

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(2009) 80 (4), art. no. 046117, .

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(2008) 78 (6), art. no. 064024, .

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(2006) 73 (1), pp. 142-148.

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(2005) 22 (23), pp. 5157-5168.

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Filippi, S., Novikov, I.D., Ruffini, R.

The capture of particles in an Einstein-Straus Universe. A Newtonian approach

(1984) 39 (8), pp. 165-170.

Projects

Awards and Funding
(2022-2024) Principal Investigator UCBM Unit, Research and Innovation Action (RIA) "MUQUABIS – Multiscale Quantum Bio-Imaging and Spectroscopy", in collaboration with CNR-INO, (Horizon Europe Framework Programme).
(2022-2024) Scientific Coordinator CNR URT@UCBM, (CNR-INOb) EBRAINS project, PNRR.
(2010-2022) Principal Investigator "Interdisciplinary Complex Systems" (ICRANET Grant).
(2014) Nomination "L'Oreal-UNESCO for Women in Science Awards 2015: Physical Sciences".
(2013) Journal Cover for Journal of Physics A: Mathematical and Theoretical.
(2011) Research Contract, Arizona State University (ASU), Research Leader.
(2009) PRIN 2009. Research Subunit Leader.
(2000) COFIN 2000.
(1993-1996) European Union International Project, CEE grant number CI1*-CT92-0013.
(1992) Italian Space Agency (ASI). Grant number ASI-92-RS-150.
(1991) Italian Space Agency (ASI). Grant number PF-ASI-91-315.

Patent
PATENT N◦102018000002704 Medical Device for Optimal Wound Healing.

Memberships

Editorial Responsibility
Associate Editor, Frontiers in Physics
Topic Editor, Simulating Normal and Arrhythmic Dynamics: From Sub-Cellular to Tissue and Organ Level. Frontiers.

Journal reviewer (selected)
APS (Physical Review Letters, Physical Review, Physical Review X)
Computer Methods and Programs in Biomedicine (Elsevier)
PlosOne.

Grant reviewer (selected)
FISR Reviewer Progetto FISR 2020- Ministry of University and Research of Italy
FIRB Future in Research, Italian MIUR.
Natural Sciences and Engineering Research Council of Canada.

Conferences Organization
Member of the International Coordinating Committee of the Fifteenth Marcel Grossmann Meeting - MG15 University of Rome "La Sapienza" - Rome, July 1-7, 2018
Local Promoter, 19h International Conference on Finite Elements in Flow Problems - FEF 2017, Rome (IT).
Member of the International Coordinating Committee,"The Fourteenth Marcel Grossmann Meeting", Rome Sapienza University, July 12-18, (I) 2015.
Mini symposium Organizer del XXXIII Dynamics Days Europe 2013 Conference, Madrid, (SPAIN), 2013.
Member of the International Coordinating Committee,"The Thirteenth Marcel Grossmann Meeting", Stockholm University, July 1-7, (SWEDEN) 2012.
Member of the International Organizing Committee, 3rd "Galileo-XuGuangqi Meeting", Beijing, 11-15 October (CHINA), 2011.
Member of the International Organizing Committee, 2nd "Galileo-XuGuangqi meeting", Xu Guangqi meeting, July 12-18, Nice (FRANCE), 2010.
Member of the International Scientific Advisory Committee, The First "Galileo - Xu Guangqi meeting" "THE SUN, THE STARS, THE UNIVERSE AND GENERAL RELATIVITY SHANGHAI", (CHINA) 2009.
Chairman of the Session "Self-Gravitating Systems", "The Tenth Marcel Grossmann Meeting", Rio de Janeiro, July 20-26, (BRAZIL) 2003.
Member of the Local Organizing Committee, "The Ninth ICRANet Workshop", "Fermi and Astrophysics", October 3-7, Pescara, (IT) 2001.

Memberships
Associate Researcher Italian Institute of Optics, CNR-INO
Adjoint Professor International Center for Relativistic Astrophysics Network, ICRANET
Member of National Group of Mathematical Physics, GNFM

Other Relevant Information

RESEARCH INTERESTS
Nonlinear systems Mathematical Modeling (Living matter, biological systems, complex networks).
Neurons and brain activity models.
Multiscale and multiphysics modeling.
Experimental data analysis.