

Rosalba Saija
- CURRICULUM VITAE -

PERSONAL INFORMATION

Rosalba Saija
Date of birth: 10/29/1958
Nationality: Italian
Address: (Home) Viale Regina Margherita 61 - 98121 Messina
(Office) Department of Mathematics and Computer Science, Physics and Earth Science (MIFT) – University of Messina
Viale Stagno d'Alcontres 31, 98166 Messina
Telefono: 090 676 5647
e-mail: rsaija@unime.it
Web: <http://dfmtfa.unime.it/profs/rsaija/rosalbasaija.html>

WORK EXPERIENCE AND TEACHING ACTIVITY

August 2018 – Present

Member of the *Abilitazione Scientifica Nazionale* Committee, SD 02/B2 – SSD FIS/03

October 2018 – Present

Coordinator of The Bachelor's and Master's degree course in Physics at the University of Messina

March 2018 – Present

Full Professor, scientific field *Physics of Matter*

- *Teaching Activity*
Mathematical Methods in Physics (*Bachelor's Degree in Physics*)
Modern Physics (*Bachelor's Degree in Physics*)
Electromagnetic Scattering (*Master Degree in Physics*)
Nano-optics (*PhD School in Physics*)

2011

Guest Editor JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER, Volume: 113 Issue: 18 Published: DEC 2012 ISSN: 0022-4073

26-30 Sept 2011

Chair of Organization Committee of XIII International Conference on “*Electromagnetic Light Scattering*” (Taormina, Messina)

August 2011 – February 2018

Associate Professor, scientific field *Physics of Matter*

November 2011 - Present

Associate Researcher at IPCF – CNR (Research National Council)

April 2005

Editor of Volume n.6 “*Light, Dust and Chemical Evolution*” (Journal of Physics: Conference Series)

26-30 Settembre 2004

Chair of Organization Committee of the International Workshop on “**Light, Dust and Chemical Evolution**” (Gerace, Reggio Calabria)

25 March 2003

Rosalba Saija

Member of *Advisory and Program committee* of International Workshop ***Dust and molecules in the interstellar medium - Observations by microwave radio astronomical techniques*** (Messina, 25 marzo 2003)

2003

Co-author of “*Scattering from Model Nonspherical Particles. Theory and applications to Environmental Physics*” Monography, Springer-Verlag, Heidelberg,

March 1983 - July 2011

Senior researcher, scientific field *Physics of Matter*

EDUCATION AND TRAINING

November 1988

March 1986

August/Sep 1984

Visiting researcher at US Army Edgewood Chem. Biol. Center., Aberdeen PG, Maryland (USA)

November 1980

“Laurea” in Physics, University of Messina, supervisor Prof. Ferdinando Borghese.

FUNDED RESEARCH PROJECT

From 2016

Member of *Research & Mobility 2016 Project* (project code RES_AND_MOB_2016_-TORRISI), University of Messina.

From 2014

Local manager of *Materials, Physical and Nanosciences COST Action MP1403 (Nanoscale Quantum Optics)*

2012-2015

Member of *HIPPOCRATES Research Project* (PON02_00355_2964193)

2002-2006

Principal investigator of three-years project on “*The Optical Properties of Aerosols. (Biological aerosols)*”, Department of Environment dell’ U.S Army European Research Office. contract n. N622558-02-C-9040

2003 – 2005

Member of Scientific research program of relevant national interest (MIUR-COFIN) ‘*Effetti meccanici e biologici dell’interazione della radiazione con i grani del mezzo interstellare*’.

2001- 2002

Principal Investigator del one-year research project on “*Simulation of the Optical Properties of Atmospheric Aerosols in the Planetary Boundary Layer*”, Environmental Sciences Branch dell’ U.S Army European Research Office, Contract n. N68171-01-M-5907

2000 – 2002

Member of Scientific research program of relevant national interest (MIUR-COFIN) ‘*Cosmic Dust and Gas (Polvere e Gas nello Spazio: connessioni e evoluzione)*’.

1998 - 1999

Member of Scientific research program of relevant national interest (MIUR-COFIN) ‘*Dust and Molecules in astrophysical environment (Polvere e Molecole in ambiente astrofisico)*’.

1984

Principal Investigator of “*Optical Properties of aerosol particles*”, l’US Army European Research Office, contratto n. DAJA45-84-C-0005

Rosetta Saija

RESEARCH ACTIVITY

Research sectors

The research activity is mainly focused on the study of extinction processes (scattering + absorption) of light by nano and micrometric particles. Its activity takes place on two parallel research fields: the first concerns the classical and quantum nano-optical sector, the second is the study of interstellar powders. In this context, over the years, she has:

- developed an analytical theory for the calculation of electromagnetic scattering from non-spherical particles.
- developed an efficient T-matrix method for the determination of scattering and extinction cross sections from random distributions of asymmetric nano particles.
- applied group theory techniques to the problem of scatterers with symmetry properties, realizing an efficient and robust code for the numerical calculation of electromagnetic scattering.
- detailed studies on the effect of non-sphericity, on the polarization properties, depolarization and aerosol radiative transport.
- developed an analytical theory and an efficient numerical code, for the calculation of electromagnetic scattering from non-spherical particles deposited on metallic and dielectric substrates.
- developed an analytical theory and an efficient numerical code for determining the force and the moment transferred from the radiation to the nano particles.
- developed an analytical theory and an efficient numerical code to study the phenomena of optical entrapment in optical tweezers.
- applied the theory to the interpretation of experimental data acquired in different experimental situations.

She is co-author of more than 100 publications published in international journals. She is co-author of the volume "Scattering from Model Nonspherical Particles. Theory and applications to Environmental Physics ", Springer-Verlag, Heidelberg, appeared as first edition in 2002 and second in 2007.

She is referee of some international scientific journals such as JQSRT, JOSA A, Applied Optics, JOP.

Books and Articles (2014-2019)

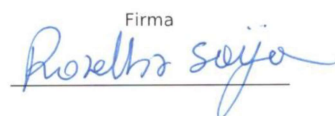
1. *Light-matter Interaction Under Intense Field Conditions: Nonlinear Optical Properties of Metallic-dielectric Nanostructures*,
Enza Fazio, Luisa D'Urso, Rosalba Saija, Saveria Santangelo, and Fortunato Neri
Current Nanomaterials 2019, 4, 51-62
2. *Chiral optical tweezers for optically active particles in the T-matrix formalism*
Patti F, Saija R., Denti P., Pellegrini G., Biagioni P., Iatì M.A., Maragò O.
Scientific Report 9(1),29 (2019)
3. *Near-field imaging of surface plasmon vortex-modes around a single elliptical nanohole in a gold film*
Claudia Triolo, Salvatore Savasta, Alessio Settineri, Sebastiano Trusso, Rosalba Saija, Nisha Rani Agarwal, Salvatore Patanè
Scientific Reports, 9:5320 (2019)

Rosalba Saija

4. *Optical tweezers and their applications*
Polimeno, P., Magazzù, A., Iatì, M.A., (...), Volpe, G., Maragò, O.M.
Journal of Quantitative Spectroscopy and Radiative Transfer 218, pp. 131-150 (2018)
5. *Electrospun Conjugated Polymer/Fullerene Hybrid Fibers: Photoactive Blends, Conductivity through Tunneling-AFM, Light Scattering, and Perspective for Their Use in Bulk-Heterojunction Organic Solar Cells*
Zhenhua Yang, Maria Moffa, Ying Liu, Hongfei Li, Luana Persano, Andrea Camposeo, Rosalba Saija, Maria Antonia Iatì, Onofrio M. Maragò, Dario Pisignano, Chang-Yong Nam, Eyal Zussman, and Miriam Rafailovich
Journal of Physical Chemistry C, 122, pp. 3058-3067 (2018)
6. *Optical trapping and optical force positioning of two-dimensional materials*
M. G. Donato, E. Messina, A. Foti, T. J. Smart, P. H. Jones, M. A. Iatì, R. Saija, P. G. Gucciardi and O. M. Maragò
Journal of Physical Chemistry C, 122, pp. 3058-3067 (2018)
7. *Biomimetic Amorphous Lasers through Light-Scattering Surfaces Assembled by Electrospun Fiber Templates*
Maria Moffa, Andrea Camposeo, Vito Fasano, Barbara Fazio, Maria Antonia Iatì, Onofrio M. Maragò, Rosalba Saija, Heinz-Christoph Schroder, Werner E. G. Muller, and Dario Pisignano
Laser Photonics Rev. 1-9 1700224 (2018)
8. *Ferdinando Borghese (26 May 1940–19 January 2017)*
M.A. Iatì, R. Saija, O.M. Maragò, P. Denti
JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER Volume: 201 Pages: 226-228 (2017)
9. *Spin-Momentum Locking in the Near Field of Metal Nanoparticles*
C. Triolo, A. Cacciola, S. Patanè, R. Saija, S. Savasta, and F. Nori
DOI: 10.1021/acsphotonics.7b00436, *ACS Photonics*, Published on Line, August 2017
10. *Spectral shift between the near-field and far-field optoplasmonic response in gold nanospheres, nanoshells, homo- and hetero-dimers*
Cacciola, A.; Iatì, M. A.; Saija, R.; et al.
JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER Volume: 195 Special Issue: SI Pages: 97-106 Published: JUL 2017
11. *Coherent backscattering of Raman light*
Fazio, Barbara; Irrera, Alessia; Pirodda, Stefano; et al.
NATURE PHOTONICS Volume: 11 Issue: 3 Pages: 170+ Published: MAR 2017
12. *Optical Trapping of Plasmonic Mesocapsules: Enhanced Optical Forces and SERS*
By: Spadaro, D.; Iatì, M. A.; Perez-Pineiro, J.; et al.
JOURNAL OF PHYSICAL CHEMISTRY C Volume: 121 Issue: 1 Pages: 691-700 Published: JAN 12 2017
13. *RANDOM OPTICAL MEDIA BASED ON HYBRID ORGANIC-INORGANIC NANOWIRES: MULTIPLE SCATTERING, FIELD LOCALIZATION AND LIGHT DIFFUSION*
Persano, L.; Moffa, M.; Fasano, V.; et al.
Edited by: Tabor, CE; Kajzar, F; Kaino, T; et al. Conference: Conference on Organic Photonic Materials and Devices XIX Location: San Francisco, CA Date: JAN 30-FEB 01, 2017 Sponsor(s): SPIE ORGANIC PHOTONIC MATERIALS AND DEVICES XIX Book Series: Proceedings of SPIE Volume: 10101 Article Number: UNSP 1010103 Published: 2017
14. *The activation of non-linear optical response in Ag@ZnO nanocolloids under an external highly intense electric field*
Fazio, E.; D'Urso, L.; Santangelo, S.; et al.
NUOVO CIMENTO C-COLLOQUIA AND COMMUNICATIONS IN PHYSICS Volume: 39 Art #: 307 (2017)
15. *Strongly enhanced light trapping in a two-dimensional silicon nanowire random fractal array*
By: Fazio, Barbara; Artoni, Pietro; Iatì, Maria Antonia; et al.
LIGHT-SCIENCE & APPLICATIONS Volume: 5 Article Number: e16062 Published: APR 2016

Rosalba Saija

16. *Optical tweezers: a non-destructive tool for soft and biomaterial investigations*
Magazzu, A.; Spadaro, D.; Donato, M. G.; et al.
RENDICONTI LINCEI-SCIENZE FISICHE E NATURALI Volume: 26 Supplement: 2 Pages: 203-218 , 2015
17. *Plasmonic Absorption Enhancement of a Single Quantum Dot*
Arena, S.; Cucinotta, F.; Di Stefano, O.; et al.
PLASMONICS Volume: 10 Issue: 4 Pages: 955-962 Published: AUG 2015
18. *Modeling of Enhanced Electromagnetic Fields in Plasmonic Nanostructures*
Maria Antonia Iati, Elefterios Lidorikis, and Rosalba Saija
Handbook of Enhanced Spectroscopy, Chapter 3 , Edited by Pietro Giuseppe Gucciardi, Marc Lamy de la Chapelle, and Nathalie Lidgi-Guigu, Copyright 2016 Pan Stanford Publishing Pte. Ltd. ISBN 978-981-4613-32-3 (Hardcover), 978-981-4613-33-0 (eBook), September 15, 2015
19. *Subdiffraction Light Concentration by J-Aggregate Nanostructures*
Cacciola, Adriano; Triolo, Claudia; Di Stefano, Omar; et al.
ACS PHOTONICS Volume: 2 Issue: 7 Pages: 971-979 Published: JUL 2015
20. *Optical trapping of silver nanoplatelets*
By: Messina, E.; Donato, M. G.; Zimbone, M.; et al.
OPTICS EXPRESS Volume: 23 Issue: 7 Pages: 8720-8730 Published: APR 6 2015
21. *Near-Field Optical Detection of Plasmon Resonance from Gold Nanoparticles: Theoretical and Experimental Evidence*
Triolo, Claudia; Cacciola, Adriano; Saija, Rosalba; et al.
PLASMONICS Volume: 10 Issue: 1 Pages: 63-70 Published: FEB 2015
22. *Scaling of optical forces on Au-PEG core-shell nanoparticles*
Spadaro, Donatella; Iati, Maria A.; Donato, Maria G.; et al.
RSC ADVANCES Volume: 5 Issue: 113 Pages: 93139-93146 Published: 2015
23. *Superior plasmon absorption in iron-doped gold nanoparticles*
By: Amendola, Vincenzo; Saija, Rosalba; Marago, Onofrio M.; et al.
NANOSCALE Volume: 7 Issue: 19 Pages: 8782-8792 Published: 2015
24. *Ultrastrong Coupling of Plasmons and Excitons in a Nanoshell*
Cacciola, O. Di Stefano, R. Stassi, R. Saija, and S. Savasta
ACS NANO, Article ASAP DOI: 10.1021/nn504652w, Published on line October 22, 2014
25. *Polarization-dependent optomechanics mediated by chiral microresonators*
Donato, M. G.; Hernandez, J.; Mazzulla, A.; et al.
NATURE COMMUNICATIONS Volume: 5 Article Number: 3656 Published: APR 2014

Firma


Rosalba Saija