

Actual Position

Full Professor in Earth Physics, SSD FIS/06, SC 02/C1

Delegate of the Director of the Department of Mathematics and Physics for Dissemination and Public Outreach activities

Head of the Earth and Planetary Physics Laboratory at the Department of Mathematics and Physics.

Research field

My main field of research regards the development and application of physical methods for the investigation of the rocky and icy planetary crusts. My work is focused on laboratory and in situ characterization of physical parameters of geo-materials such as ice, snow, compact and loose rocks with particular interest in electromagnetic wave propagation in natural media. A part of my research is dedicated to the performance of geophysical instruments, like GPR antenna coupling effects. Moreover, I have been working on the development of laboratory techniques for the estimation of the electromagnetic parameters of solid, liquid and granular materials.

Previous Positions

2016 - 2019 **Associate Professor** SSD FIS/06, SC 02/C1 in the Mathematics and Physics Department, Università degli studi Roma Tre, Rome – Italy.

2005 - 2015 **Assistant Professor** SSD FIS/06, SC 02/C1 in the Mathematics and Physics Department, Università degli studi Roma Tre, Rome – Italy.

2000 - 2004 **Assistant Researcher** in the “E.Amaldi” Physics Department at Roma Tre University.

1998 - 1999 **Assistant Researcher** in the Neuroimaging Laboratory (Nuclear Magnetic Imaging research Group)- Fondazione Santa Lucia – I.R.C.C.S., Rome.

1994 - 1996 **Post-doctoral Fellow** in Applied Electromagnetics and Electro-physics, Faculty of Engineering, University of Rome "La Sapienza".

1993 - 1994 **Post-doctoral Fellow** in the Department of Geology and Geophysics, University of Waterloo (Canada) (CNR Fellowship).

Education

1993 PhD in Applied Geophysics, Faculty of Engineering, University of Trieste.

1988 Degree in Earth Science, **Geophysics Curriculum**, Faculty of Science, University of Rome "La Sapienza" (110/110 Cum Laude).

Award

2020 ACCS-Roma Award – For the *Nature Astronomy* article describing the discovery of Martian subglacial lakes.

2014 Ludger Mintrop Award - EAGE - European Association of Geoscientists & Engineers, for the paper '*Comparison of GPR and unilateral NMR for water content measurements in a laboratory scale experiment*'. Best paper published in *Near Surface Geophysics*.

2011 Menegetti Award for Physics, for the paper "*Radio wave techniques for non-destructive archaeological investigations*", published in *Contemporary Physics*.

1993 Gold Medal for Applied Geophysics ("Armando Norinelli" Award, University of Padova), for the PhD thesis "*Geo-radar: theory and applications*".

Member of International Teams

2021 – present ESA Topical Team - Geophysical Investigations from the Surface of the Moon.

2019 – present Co-Investigator of the experiment SRS onboard Envision ESA mission for the subsurface exploration of Venus.

2018 – present Member of the ESA Lunar Science Team: “Strategy for Science at the Moon” 2020-2030.

2012 – present Co-Investigator of the RIME experiment of the ESA JUICE mission, dedicated to the exploration of the internal structure of Jupiter's icy satellites.

2006 – present Italian Manager (and Co-I) for the WISDOM instrument aboard ESA's EXOMARS rover for the search for biological traces on Mars.

2005 - present Co-Investigator of the SHARAD experiment of the NASA mission - MRO.

2005 - present Co-Investigator of the MARSIS experiment of the ESA mission - Mars Express.

2002 - 2003 Member of the ESA Topical Team: Electromagnetic and other geophysical techniques for in-situ and orbital planetary exploration.

Responsible for the following projects funds

2020-2022 DARA Italian Government Measurements of physical properties and thickness of ice and snowpack in the central Apennines using GPR and TDR techniques (24 months) (48.000Euro) **Project Leader**

2019-2021 ENVISION – SRS Experiment, WP2000 High-temperature electromagnetic measurements of rocks simulating the subsurface of Venus – (24 months), (2019-25-HH.0) ASI Funds, (66.747 Euro) **WP Leader**

2019-2021 PRIN-INAF MELODY: Moon multisensor and Laboratory Data analysis WP2 Subsurface Geophysics – (24 months) (60.000Euro) **WP Leader**

2018 - 2022 JUICE MISSION - RIME Experiment, WP3200 Science on Europa -(42 months), (2018-25-HH.0) ASI Funds, (110.749 Euro) **WP Leader**

2016 - 2018 JUICE MISSION - RIME Experiment, WP3300 Science on Europa - (30 months) (2013-056-R.1). ASI Funds (54.418 Euro) **WP Leader**

2016 - Extraordinary Research Development Plan: “Strengthening of the University's research laboratories” Roma Tre University Funds (105.000 Euro) **Project Leader**

2015 – 2017 SMART ENVIRONMENT (24 months) REGIONE LAZIO Funds one year Post Doc position **WP Leader**

2014 – 2015 JUICE MISSION - RIME Experiment, WP3300 Science on Europa - (24 months). (2013-056-R.0) ASI Funds (27.094 Euro) **WP Leader**

2011 – 2012 Kelsey Museum of Archaeology, University of Michigan (USA) (12 months) UM Funds (12.000Euro) **Project Leader**

2011 - 2015 EXOMARS PHASE C2/D, WP1300 WP7000 WISDOM Experiment (48 months), (I/060/10/0) ASI Funds (410.085 Euro). **WP Leader**

2011-2013 PROJECT: Integration of non-destructive techniques GPR and NMR for cultural heritage applications (36 months) REGIONE LAZIO Funds 3 years Post Doc position **Project Leader**

2008 - 2009 EXOMARS PHASE B/C1, WP7000 WISDOM Experiment (18 months). (I/029/08/0) ASI Funds. (119.000 Euro) *WP Leader*

2008 - 2012 SHARAD - MRO (Shallow RADAR Sounding), WP 1330 Radar data inversion. (48 months). (I/061/08/0) ASI Funds. (114.516 Euro) *WP Leader*

2005 - 2007 SHARAD-MRO (Shallow RADAR Sounding), WP3300 Electromagnetic properties of soil and rocks. (36 months). (I/007/05/0). ASI Funds (20.000Euro) *WP Leader*

2006 - 2007 Project INGV-DPCI V3_5/12 Vulcano (24 months). GNV-CNR Funds. (4.000 Euro) *Research Unit Leader*

2005 - 2007 MARS EXPRESS – MEX, WP1600 ACQUA_EMSS (EM measurement of soil samples). (36 months), (I/010/05/0) ASI Funds. (110.000Euro) *WP Leader*

2000- 2001 ARES - (Ares soil Characterization by QUadrupole Analysis) (24 months). ASI Funds. (200 million Lire) *Team Member*

Teaching

Undergrad, grad, and PhD courses in general physics, applied physics and geophysics since 1997. Also part of the Roma Tre training program for high school teachers.

Current Courses in the Physics Degree Curriculum: Principles of Environmental and Earth Physics; Experimental Measurements in Geophysics; Earth Physics.

Current Courses in the PhD Curriculum (Physics): Physics of Planetary Ices.

Undergrad, PhD and Postdoc supervision:

Thesis supervisor of 9 PhD students and 68 undergrad students (I and II level degree) and 8 postdocs.

Referee and advisor:

Evaluation of Italian research quality (VQR 2004-2010, and 2011-2014); MIUR Program "Rita Levi Montalcini" evaluator; NASA Postdoctoral Program (NPP) Evaluator; Member of the Selection Committee for the Chair of Geophysical EM methods at the Department of Geotechnology, Delft University of Technology, Netherlands; Swiss National Science Foundation (SNSF) Professorship peer-review; External evaluator for a permanent position as Associate Professor at the Department of Planetary Science, University of Arizona, Tucson, USA.

Evaluation of Full Professor, Associate Professor, Assistant Professor and Researcher permanent positions for several Italian Universities and research centers.

Evaluation of PhD candidates for several Italian and European Universities.

Journal Peer Reviewer:

Science (AAAS); Journal Geophysical Research; Geophysics; IEEE Transaction Geoscience and Remote Sensing; Near Surface Geophysics; Journal of Hydrology; Geophysics Research Letters; Planetary and Space Science; Water Resources Research; Journal of Applied Geophysics; Subsurface Sensing; IEEE JSTARS.

Invited talks

2021 – IWAGPR – University of Malta. Title: Searching for subglacial liquid water on Mars using MARSIS

2021 – EGU General Assembly - GIFT workshop distinguished speaker. Title: The search for liquid water below the Martian surface.

2020 – INGV Title: The search for liquid water in the Martian subsurface.

2019 – CETEMPS – Università dell'Aquila. Title: *Estimation of snow parameters using Ground Penetrating Radar.*

2016 – CEOS - Centre for Earth Observation Science, University of Manitoba, Manitoba, Canada. Title: *Planetary geophysics: looking inside the icy crusts of solar system bodies using radio waves*.

2012 Workshop GPR and Applications: *Laboratory and Field Measurements of Soil and Rocks Electromagnetic Properties* - 18th European Meeting of Environmental and Engineering Geophysics EAGE - Paris, France.

2010 Tutorial in *Soil electromagnetic parameters estimation using frequency and time domain techniques* - XIII International Conference on Ground Penetrating Radar Lecce, Italy.

1998 Summer school in Active Faulting and Paleoseismology - European Center for Geodynamics and Seismology - Luxemburg. Title: *Application of Ground Penetrating Radar to Faults and Fracture*.

Publications

About 85 papers on peer review international journals; among these, two papers on ***Nature Astronomy***, one on ***Science Advances***, and four on ***Science***. More than 140 conference papers and 3 book chapters.

Dissemination and Public Outreach

I am involved in many disseminations and public outreach activities for the department and university, including European Researchers' Night, Pint of Science, TED's Talk, seminars for high school teachers, masterclass in geophysics, scientific festivals and department events. Moreover, I have been interviewed by several TV, radio and newspapers about my work as a scientist. Among these: BBC International, CBC international, CNN International, Public Broadcasting System (PBS) NOVA - USA, CCTV (China Central Station), Radio Svizzera Italiana, Rai Tre Scienza, Italian Public and Private Broadcasting, The Guardian, National Geographic, Scientific American, Popular Science, New Scientist, IEEE Spectrum, Le Scienze, La Repubblica, Corriere della Sera, Messaggero, ANSA.

Bibliometric Parameters (28/09/2021)

SCOPUS: Citations: 1880, H-index: 22

GOOGLE SCHOLAR: Citations: 3057, H-index: 27