PERSONAL INFORMATION   Manuela Bonano

Enterprise	University	EPR
☐ Management Level	☐ Full professor	☒ Research Director and 1st level Technologist / First Researcher and 2nd level Technologist
☐ Mid-Management Level	☐ Associate Professor	☐ Level III Researcher and Technologist
☐ Employee / worker level	☐ Researcher and Technologist of IV, V, VI and VII level / Technical collaborator	☐ Researcher and Technologist of IV, V, VI and VII level / Technical collaborator

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WORK EXPERIENCE

1st January 2023 – today

Senior Researcher (Level II)
Institute for Electromagnetic Sensing of the Environment (IREA) of the National Research Council of Italy (CNR), via Diocleziano 328, 80124 Napoli (Italy) - www.irea.cnr.it
- Research activity and coordination of scientific teams and projects in the field of numerical processing of Synthetic Aperture Radar (SAR) data acquired in conventional and interferometric mode for the study of surface deformations associated with geophysical and anthropic hazards
- Development and application of advanced multi-temporal, multi-frequency, multi-scale DInSAR algorithms to detect and monitor surface deformations in natural/built-up environments.
- Research activity and development of advanced DInSAR methodologies for processing large full-resolution SAR sequences, by exploiting GPU parallel techniques, to detect and monitor deformations of the built-up heritage, with particular attention to bridges and transport infrastructures
- Project or team coordinator for research activities and Work Packages (WP) within national projects/agreements.
- Coordinator for research grants, funded by IREA-CNR

30 December 2016 – 31 Decembre 2022

Level III Researcher

From 15 April 2019- 31 December 2022: Institute for Electromagnetic Sensing of the Environment (IREA), National Research Council of Italy (CNR), via Diocleziano 328, 80124 Napoli (Italy)

- Research in microwave remote sensing field: spaceborne differential Synthetic Aperture Radar (SAR) interferometry (InSAR) for surface deformation phenomena analysis in natural/built-up environment.
- Development of advanced methodologies and algorithms for interferometric processing of full resolution Synthetic Aperture Radar (SAR) data, aimed at the generation of automatic chains for the massive and systematic processing of large interferograms datasets, at medium/high spatial resolution, by using Cloud Computing and HPC e-infrastructures (multi-nodes, multi-cores, GPU), for analysing and monitoring ground deformation phenomena relevant to natural and urban areas.
- Responsible for research activities and Work Packages (WP) within national projects/agreements
- Responsible for research fellowships, funded by IREA-CNR.

From 30 December 2016- 14 April 2019: Institute of Methodologies for Environmental Analysis (IMAA), National Research Council of Italy (CNR), C.da S. Loja – Z.I. 85050 Tito Scalo (PZ) (Italy)

- Development and implementation of advanced DInSAR techniques for processing large volumes of full resolution satellite SAR data, acquired by new generation multi-frequency SAR sensors (COSMO-SkyMed, TerraSAR-X e Sentinel-1), through the exploitation of both multi-node/multi-core programming techniques and distributed HPC e-infrastructures equipped with GPUs.

From 16 September 2013- 29 December 2016: Institute for Electromagnetic Sensing of the Environment (IREA), National Research Council of Italy (CNR), via Diocleziano 328, 80124 Napoli (Italy)

- Development of advanced methodologies and algorithms for interferometric processing of Synthetic Aperture Radar (SAR) data, aimed at analysing and monitoring natural and anthropogenic ground deformation phenomena. Funded: MARsite European Union's Seventh Programme for research, technological development and demonstration, G.A. N° 30841

17 September 2007 - 15 September 2013

Research fellow

Institute for Electromagnetic Sensing of the Environment (IREA) of the National Research Council of Italy (CNR), via Diocleziano 328, 80124 Napoli (Italy)

- Generation of advanced full resolution DInSAR products (mean deformation velocity maps and corresponding time series) by exploiting interferometric SAR data acquired by both previous C-band and new X-band SAR sensors, aimed at investigating localized displacements affecting single

buildings and man-made structures in urban areas. Funded: Research program under the agreement between the Italian Minister Council Presidency and the Italian Civil Protection Department, index no. 622 of 20/12/06, and the "DORIS" project of the 7th Framework Programme of the European Union.

OTHER WORK EXPERIENCES

27 September 2021
- Teaching module (4 hours) entitled "Advanced techniques of data acquisition, management and processing: Remote Sensing and satellite data" as part of the I Level Master in "Management of Emergencies and Resilience of the Communities and Territories", Università degli Studi del Molise. Qualification: expert in Remote Sensing technology, DInSAR data processing, deformation monitoring of natural and built-up environment.

July 2011-August 2011
- Visiting Scientist with the Earth and Planetary Science (EPS) Department, University of California at Berkeley (UCB), California (USA) under the scientific supervision of Prof. Roland Burgmann

May 2010-June 2010
- Teaching module (22 hours) entitled "Processing chains of radar data for the generation of velocity maps and deformation time series" as part of the IFTS course "Master technician for the Monitoring and Management of the Territory and the Environment". Istituto Salesiano "Sacro Cuore", Napoli

PROJECTS AND AGREEMENTS

July 2023-today
- Scientific Coordinator of CNR-IREA Unit of the PRIN 2022 National Research Project entitled "Safeguard of Modern Urban Heritage: a cross-disciplinary WebGIS for Knowledge, Monitoring and Risk Analysis" -SMUH (Code: 2022M7W3BM)

July 2022 – today
- Scientific coordinator of the CNR-IREA unit of the CN-MOST, Spoke 7 "CCAM, Connected Networks and Smart Infrastructure", funded under the National Recovery and Resilience Plan (PNNR), Mission 4 Component 2 Investment 1.5, by the European Union – NextGenerationEU

2021 – today
- Responsible for the CNR-IREA unit of the accomplishment of the first Guidelines document for the use of satellite interferometric data aimed at the interpretation of structural behavior of buildings, developed within the DPC-RELUIS 2019-2021 project, which was published on 10 October 2023

July 2021 – December 2022
- Responsible for the WP1103 of the DInSAR Multi-frequenza/Multi-piattaforma per analisi Multi-scala dei movimenti del suolo (Contratto ASI & CNR-IREA "DInSAR-3M" n. 2021-8-U.0 - CUP F65F21000530005) – DInSAR-3M. Project funded by the Italian Space Agency (ASI)

2021-today
- Responsible of IREA-CNR team of the CNR project "Transizione industriale e resilienza delle Società post-Covid19 (FOE 2020 CNR)"

2020-today
- Alternate of the National Research Council of Italy (CNR) within the General Assembly of the Joint Research Unit (JRU) "HPC4NDR - High Performance Computing for Natural Disaster Resilience"

EDUCATION AND TRAINING

February 2012

PhD in Infrastructures and Transportation, XXIV cycle

Thesis Title:" Advanced Interferometric SAR Satellite Methodologies for Ground Deformation Analysis in Urban Areas", Università degli Studi di Roma "La Sapienza", Faculty of Engineering, Department of Civil Engineering, Architecture and Environment (DICEA), 18, Via Eudossiana, 00184, Roma, Italy

December 2004

Laurea Degree (summa cum laude) in Environmental Engineering.

Thesis title: "The exploitation of SAR Interferometry technique for ground deformation measurement", Università degli Studi di Cagliari, Faculty of Environmental Engineering, 2, Via Marengo, Cagliari, Italy

PERSONAL SKILLS

Mother tongue(s)

Italian

Other language(s)

UNDERSTANDING		SPEAKING		WRITING
Listening	Reading	Spoken interaction	Spoken production	
C1	C1	C1	C1	C1
Certificate of Advanced 1 Level.				

(English)

Computer skills
- competent with common operating systems: Windows, Linux, Mac-OS, Microsoft Office Programmes
- good knowledge of some programming languages: IDL, FORTRAN, C and CUDA development environment for GPU exploitation

ADDITIONAL INFORMATION

Most Relevant ISI Publications
- **Bonano, M.**, Manunta, M., Marsella, M. & Lanari, R., (2012), Long-Term ERS/ENVISAT Deformation Time-Series Generation at Full Spatial Resolution via the Extended SBAS Technique, *Int. J. Remote Sens*., vol. 33, issue 15, pp 4756-4783, doi:10.1080/01431161.2011.638340
- **Bonano, M.**, Manunta, M., Pepe, A., Paglia, L. & Lanari, R., (2013), From Previous C-Band to New X-Band SAR Systems: Assessment of the DInSAR Mapping Improvement for Deformation Time-Series Retrieval in Urban Areas, *IEEE Trans. Geosci. Remote Sens.*, vol. 51, issue 4, pp. 1973 - 1984, doi: 10.1109/TGRS.2012.2232933

- Arangio, S., Calò, F., Di Mauro, M., **Bonano, M.,** Marsella, M., & Manunta, M. (2014). An application of the SBAS DInSAR technique for the assessment of structural damage in the city of Rome. *Structure and Infrastructure Engineering*, 10(11), pp. 1469-1483
- Scifoni, S., **Bonano, M**., Marsella, M., Sonnessa, A., Tagliafierro, V., Manunta, M., Lanari, R, Ojha, C and Sciot M.(2016) "On the joint exploitation of long-term DInSAR time series and geological information for the investigation of ground settlements in the town of Roma (Italy)." Remote Sensing of Environment 182 (2016): 113-127.
- Lanari, R., Reale, D., **Bonano, M**., Verde, S., Muhammad, Y., Fornaro, G., Casu, F & Manunta, M. (2020). Commen on "Pre-Collapse Space Geodetic Observations of Critical Infrastructure: The Morandi Bridge, Genoa, Italy" by Milill et al.(2019). Remote Sensing, 12(24), 4011.
- Talledo, D.A.; Miano, A.; **Bonano, M.**; Di Carlo, F.; Lanari, R.; Manunta, M.; Meda, A.; Mele, A.; Prota, A.; Saetta, A et al. (2022) Satellite radar interferometry: Potential and limitations for structural assessment and monitoring, J. Buil Eng., 46, 103756. https://doi.org/10.1016/ j.jobe.2021.103756.

Lì, 20 January 2024   Manuela Bonano