

## FLORA PAGANELLI, PhD

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### Project Scientist R&D

#### CORE COMPETENCIES

<ul style="list-style-type: none"> <li>• Interdisciplinary Science &amp; Technology</li> <li>• Methodologies Development</li> <li>• Processes Development</li> <li>• Cross-functional Data &amp; Systems Development</li> <li>• Data Standards &amp; Quality</li> <li>• Team Building &amp; Leadership</li> <li>• Problem Solving</li> <li>• Program Management</li> <li>• Stakeholders' relationship /negotiations</li> </ul>	<ul style="list-style-type: none"> <li>• Python, Matlab, R, Fortran, IDL</li> <li>• Databases: UML, SQL</li> <li>• Material analysis: Hyperspectral ENVI, ICP</li> <li>• System Engineering modeling: TICRA/GRASP</li> <li>• Management: AGILE, SAFe, Jira</li> <li>• Remote Sensing &amp; GIS packages/platforms: ISIS, ENVI, ERDAS, PCI, ER Mapper, ArcGIS, QGIS Open Source</li> </ul>	<ul style="list-style-type: none"> <li>• Research and Development (R&amp;D) and Research and Analysis (R&amp;A): NASA and ESA programs in Planetary Science and Astronomy/Astrophysics</li> <li>• Journals review: Planetary and Space Science, Journal of Geophysical Research-Planets, Icarus, Optical Engineering, Remote Sensing, AAS - Planetary Science Journal, Les Journee's 2023 Proceedings</li> </ul>
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#### CAREER HIGHLIGHTS

- Led the development of the first high-power Ku-band planetary radar system for the Green Bank Observatory (GBO) with external partner Raytheon (2020-2023) and spearheaded the creation of the new Radar Division infrastructure at the National Radio Astronomy Observatory (NRAO) supported by NSF award (2021-2023).
- Contributed to the development of key reports guiding the first NASA Planetary Data Ecosystem (PDE) Independent Review Board (IRB) - [PDE IRB Final Report 2021](#), and the NASA Planetary Data System Roadmap 2017-2026 with the Roadmap Study Team (RST) - [Final Report 2017](#).
- Led analysis of the first SAR data of Saturn's moon, Titan, and spearheaded the integration of Cassini SAR and radiometry data enabling the identifying of initial classes of terrains compounds such as ice, water-ice and tholins while as associate member of the Cassini RADAR Science Team (NASA Jet Propulsion Laboratory, 2004-2017).
- Led the first RADARSAT-1 and Landsat-ETM data analysis and GIS database integration for environmental risk assessment in the Sudbury area, Ontario, Canada.
- Led the first processing methodologies and use/application of RADARSAT-1 satellite imagery and geophysical data (gravimetry and seismic surveys) GIS integration for oil exploration in the Nordegg area, foothills of Canadian Rockies, and for kimberlite exploration in the Buffalo Head Hill area of Northern Alberta, Canada.

#### PROFESSIONAL EXPERIENCE

##### **2017-present - Affiliate Scientist - SETI Institute, Mountain View, CA, USA (remote)**

- Association held concurrently to other appointments for submission of proposals as PI.
- Promoter and active leader in standards and policies for planetary science and exploration through NASA and ESA interdisciplinary programs, and leading work with IAU working groups on standards requirements such as latest Lunar Reference Frame standards for navigation and cartography.
- Leading R&D research in planetary science - Titan and Enceladus' surface geological and geophysical characterization using Cassini SAR and radiometry data.
- Developed new approaches for asteroids characterization through integrated space and earth-based observations data analytics using JPL Horizons and SPICE applications.

##### **8/2020-2/2024 - Project Scientist - NRAO, Radar Division, Charlottesville, VA, USA**

- Led science use-cases and SE concept design development for the first high-power Ku-band planetary radar instrument for GBO to successfully pass internal CoDR in Mar 2023.

- Led and managed NSF proposal (2021) which spearheaded trade-studies towards a high-power Ku-band planetary radar instrument planned for GBO, followed by a second phase NSF proposal in 2022 to complete CoDR studies.
- Led the successful pre-deployment, deployment, commissioning testing/calibration operations and 2 observation campaigns (Nov 2020, Mar 2021) of the first low-power Ku-band planetary radar at GBO.

**8/2019-7/2020 - Corporate Faculty, Harrisburg University of Science and Technology STEM, Harrisburg, PA (remote)**

- Teaching Data Analytics 300 - Data Analytics theory and applications; data analytics applications development using R.

**2014-2017 - Adjunct Faculty - American Public University System (APUS), Charles Town, WV, USA (remote)**

- Space Studies Master Program - led courses: Remote Sensing Satellites, Satellite Communications, Space Transportation Systems, Research Methods, Space Operations Structure and Design, Space Station Systems and Operations, Astronomical Instrumentation, Space Policies, Lunar Geology.
- Advisory role multidisciplinary earth and planetary research studies in Remote Sensing, Space Policies, Space Operations (<https://drive.google.com/open?id=14euaQwwGJ9uklQUI0i3ceHMBSjfrSt7> ).

**2011-2014 - Full Time Faculty - University South California, Spatial Sciences Institute (SSI), Los Angeles, CA, USA**

- Geographic Information Systems and Technology (GIST) Master Program - led courses: Geospatial Data Integration, GIS Programming and Customization - Python, Spatial Databases, Remote Sensing for GIS, Concept of Spatial Thinking.
- Advisory role multidisciplinary earth and planetary research studies in Remote Sensing, GIS data integration, Geodatabases, GIS and Spatial Analysis ([https://drive.google.com/open?id=1vQ6e\\_DdmdPcM6gCnj-M-bKMu2t1AqBIJ](https://drive.google.com/open?id=1vQ6e_DdmdPcM6gCnj-M-bKMu2t1AqBIJ) ).

**2009-2010 - Associate Researcher Type II - UCLA, Dept. of Earth and Planetary Sciences, Los Angeles, CA, USA**

- Led Cassini SAR imaging and integrated GIS database used in resolving Titan's structural features.
- Resolved Titan's structural features provided new implications on Titan's icy crust global stress evolution modeling conducted using SatStress models.

**2008-2012 - Research Scientist, Proxemy Research, Inc., Gaithersburg, MD (remote)**

- Association held concurrently to other appointments for submission of proposals as PI.
- Leading Titan's icy surface studies using Cassini SAR imaging and radiometry data processing and analysis; geological and structural mapping with GIS integrated database of Titan.
- Titan's global stress field analysis during satellite evolution using SatStress.

**2007-2008 - Associate Research Scientist - European Center for Geophysics and Seismology (ECGS), Walferdange, LU**

- Led analysis of SAR SIR-C/ENVISAT ASAR data for InSAR new approach on distributed and partially distributed scatterers (PS) for ice motion of the De la Blanche glacier, French Alps, and volcanic deformation at Fogo volcano, Cape Verde, through StaMPS. Integrated StaMPS's deformation models into GIS to outline deformation patterns.
- Continued leading research and support of the Cassini RADAR Science Team on Titan's surface geological and geophysical characterization using Cassini SAR and radiometry data.

**2004-2007 - Post-Doctoral Research Associate - NASA Jet Propulsion Laboratory (JPL), Pasadena, CA, USA**

- Developed first combination of scattering and frequency-dependent dielectrics models for various compounds such as ice, water-ice and tholins from Cassini SAR and radiometry data to differentiate Titan's surface terrains and geophysical characteristics.
- Contributed to Cassini RADAR Science Team data planning and acquisition of Titan's and other targeted bodies to achieve Cassini mission's goals.
- Developed SAR SIR-C and Cassini SAR data comparative analysis to validate data characterization on Saturnian moons. SAR SIR-C data research on SAR permanent scatterers (PS) and radar interferometry (InSAR) applications.

**2003-2004 - Research Associate - Geological Survey of Canada (GSC) Ottawa, ON, CA**

- Led the first RADARSAT-1 and Landsat-ETM data analysis and GIS database integration for the environmental risk assessment in the Sudbury area (Ontario, CA).

**2002-2003 - Research Associate - Canada Centre for Remote Sensing (CCRS), Ottawa, ON, CA**

- Led ASTER multi-spectral data (ACORN data calibration) analysis and integration with RADARSAT-1 surface characteristics for bauxite exploration (North Western Australia). RADARSAT-1 and Landsat-ETM data fusion for kimberlite exploration in the Buffalo Head Hill area (Alberta, CA).

#### 1998-2002 - Doctoral Scholar - University of Alberta, department of Earth and Atmospheric Sciences, Edmonton, AB

- Led fieldwork and data processing methodologies of RADARSAT-1 satellite imagery and geophysical data (gravimetry and seismic surveys) integration for oil exploration in the Nordegg area, foothills of Canadian Rockies, and for kimberlite exploration in the Buffalo Head Hill area of Northern Alberta, Canada.
- Led fieldwork and RADARSAT-1 processing for structural mapping in the Natal belt, South Africa.

#### 1996-1997 - Research Associate - European Joint Research Center, Space Application Institute (JRC, SAI), Ispra, IT

- Led first testing of in-hose ground-based radar (LISA, linear scanner) that provided base resolution data suitable to derive interferometry images for ground monitoring capability suitable i.e. for the Salbertrand landslide (Italy). Developed ERS-1 tandem data analysis of In-SAR imaging and DEM reconstruction and integration leading to a successful application of ice flow dynamic/monitoring in the Western Alps, Italy-Swiss.

#### 1994-1996 - Master Scholar - Institute for Aerospace Survey and Earth Sciences, Enschede, NL

- Led field spectral study to calibrate remote sensing Landsat data for monitoring spectral characteristics of vegetation canopies influenced by anthropogenic dust deposition. Soil, deciduous leaves plus spruce needles ICP chemical analysis results were integrated with field spectra and remote sensing imagery to assess the Karvina Forest ecosystem (Czech Republic).

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### WORKING GROUPS

<b>2024- present</b>	International Association of Geodesy (IAG) Working Group 1.1.3 on Lunar Reference Frames
<b>2023-present</b>	Lunar Reference Frame Working Group for Navigation and Cartography (NGA)
<b>2021-present</b>	Org. Committee IAU Commission F4, Asteroids, Comets & Trans Neptunian Objects
<b>2020-present</b>	IAU Division B, Facilities, Technologies, and Data Science
<b>2020-present</b>	IAU Division F, Planetary Systems and Astrobiology
<b>2018-present</b>	IAU Division A, Fundamental Astronomy
<b>2018- present</b>	IAU Inter-Division A-F, WG Cartographic Coordinates & Rotational Elements (WGCCRE)
<b>2006-2017</b>	Cassini Radar Science Team (2004-2017) - Cassini Mission to Saturn (1997-2017)

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### CERTIFICATIONS

<b>Systems Architecting</b> , Georgia Institute of Technology (2.10 units), 2023
<b>Agile Leadership Essentials (CAL-E)</b> , Scrum Alliance, 2022
<b>Agile Leadership for Organizations (CAL-O)</b> , Scrum Alliance, 2022
<b>Agile Leadership for Teams (CAL-T)</b> , Scrum Alliance, 2022
<b>Conflict Management with Emotional Intelligence</b> . UDEMY (3.5 hours), 2022
<b>Leadership: The Emotionally Intelligent Leader</b> . UDEMY (5 hours), 2022
<b>Phased-Array Radar Systems</b> , Georgia Institute of Technology (2.10 units), 2021
<b>Phased-Array Radar Systems Lab</b> , Georgia Institute of Technology (0.35 units), 2021
<b>LABeX FOCUS</b> , Détection - Instrumentation Astronomique, OHP, Saint-Michel-l'Obs., FR, 2019
<b>SPICE</b> , Spacecraft, Planet, Instrument, Camera-matrix, Events (SPICE), ESAC/NAIF JPL, Madrid, SP, 2018
<b>SSFA</b> , Software System for Astronomical Instrumentation (SSFA), UH Hilo, HI, USA, 2017.
<b>APUS501</b> Graduate Faculty Certification, APUS Charles Town, WV, USA, 2015
<b>APUS101</b> Teacher Training Faculty Certification, APUS Charles Town, WV, USA, 2014.
<b>Europa Mission Team-X</b> - Team-lead, JPL Planetary Science Summer School, Pasadena, CA, USA, 2005

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### PUBLICATIONS

The SAO/NASA Astrophysics Data System - [Collection 2002-2023](#)  
[Publications, Proceedings, Book chapters, Reports, Seminars, and Outreach](#)

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### EDUCATION

<b>Ph.D. Remote Sensing/Geophysics</b>	<i>Advanced university studies (Doctorate)</i>
<b>University of Alberta, Dept. of Earth and Atmospheric Sciences, Edmonton, AB, CA</b>	
<i>-Use of RADARSAT-1 satellite imagery and geophysical data for oil and kimberlite exploration</i>	

**M.Sc. Geological Survey**

University studies (Master)

**Institute for Aerospace Survey and Earth Sciences, Enschede, NL (currently University of Twente)**

*-Monitoring spectral characteristics of vegetation canopies influenced by anthropogenic dust deposition using spectral and chemical data in Karvina Forest ecosystem (Czech Republic)*

**B.Sc. Geological Sciences**

University studies (Bachelor)

**University of Turin, Dept. of Earth Sciences, Turin, IT**

*-Structural mapping and petrological study of the newly found polymetamorphic Austroalpine slice, Eaux Rousses, Gran Paradise-Ophiolitic Piedmont Nappe contact*

**Dipl. Information Technology**

Post-secondary education (Vocational training)

**ITIS G. Peano, Turin, IT**

*-Information Technology, Computer programming, Complex Systems, Electronic Systems, Advanced Mathematics and Statistics*

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**OUTREACH/VOLUNTEERING**

**2014-present** Science mentorship forum for women in science and engineering [www.makepossible.ca](http://www.makepossible.ca)

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