



# PhD Program in Space Science and Technology - SST

## Optical fiber sensors integration in composite structures

Specific Seminar – Curriculum 5 and Curriculum 6

March 17, 2026, 3 p.m.

### Speaker:

Prof. Fabrizio Di Pasquale (Istitute of Mechanical Intelligence, Scuola Superiore Sant'Anna, Pisa).

### Abstract:

The seminar, after providing a brief introduction on Fiber Bragg Grating (FBG) sensors and distributed fiber sensors based on Optical Time Domain Reflectometry (OTDR) and Optical Frequency Domain Reflectometry (OFDR) techniques, will focus specifically on fiber optic sensor integration in composite materials. In particular FBG sensors, written by femtosecond laser pulses in polyamide-coated low bending loss optical fibers, and high backscattering fibers for distributed measurement, have been embedded in carbon composite structures through lamination and filament winding techniques. The integrated sensors are interrogated by using commercial FBG and OFDR reading units, and characterized in terms of temperature and strain responses. Experimental results are in good agreement with simulations, confirming that the embedding processes provide effective monitoring capabilities for structural health monitoring of composite structures for applications in specific industrial fields like aerospace.

### Short Bio

Fabrizio Di Pasquale received the degree in electronic engineering from the University of Bologna, Italy, in 1989, and the Ph.D. degree in information technology from the University of Parma, Italy, in 1993. From 1993 to 1998, he was with the Department of Electrical and Electronic Engineering, University College London, U.K., as a Research Fellow, working on optical amplifiers, WDM optical communication systems, and liquid crystal displays. After two years with Pirelli Cavi e Sistemi and two years with Cisco Photonics Italy, he moved to Scuola Superiore Sant'Anna, Pisa, Italy, where he is currently a Full Professor of telecommunications and Director of the Institute of Mechanical Intelligence. He is the Co-founder of Infibra Technologies S.r.l., a spin-off company of Scuola Superiore Sant'Anna, developing and marketing fiber optic sensor systems. He has filed 25 patents and is author or coauthor of more than 250 scientific journals and conference papers. His research interests include optical fiber sensors, silicon photonics, optical amplifiers, WDM transmission systems and networks. He has been the TPC member of several international conferences and he is on the Board of Reviewers of several international refereed journals.

### Online attendance:

Information on remote participation can be requested by sending an e-mail to [dn\\_sst@unitn.it](mailto:dn_sst@unitn.it)

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