

ExEmerge Seminar

Speaker: Giammarco Di Sciullo, PhD student at DISIM Dept. UnivAQ

Title: From Single-Mode to Space-Division Multiplexing: A New Era in Optical Fiber

Location: Seminar Room of Alan Turing building (Coppito 0)

Date: Thursday, December 12, 15:30-16:15

Live streaming on “ExEmerge Seminars” team (MS Teams code b7ti8br)

Abstract: As data rates are expected to continue their exponential increase in optical fiber networks and single-mode optical fibers are reaching their transmission limits, space-division multiplexing (SDM) has emerged as the most promising technology to address the impending information capacity crunch and to meet the ever-increasing demand for transmission capacity. Space-division multiplexing can be implemented using a variety of advanced optical fiber types, such as multi-core fibers (MCFs), both randomly coupled (RC) and weakly coupled (WC), multi-mode fibers (MMFs), and hybrid multi-core multi-mode fibers (MC-MMFs). These novel fiber designs not only expand the available spatial channels for data transmission but also offer new opportunities for ultra-high-capacity, energy-efficient, and scalable communication systems.

A fiber-optic infrastructure for space-division multiplexed transmission has been established at the University of L'Aquila, and this talk aims to provide an introduction to SDM and its potential for the future of optical communications, highlighting recent cutting-edge experiments that position L'Aquila as a significant hub for innovation in this field.

Bio: Giammarco Di Sciullo received his Bachelor's degree in Information Engineering - Telecommunications and his Master's degree in Telecommunications Engineering - Networks and Services from the University of L'Aquila. He is currently in the final year of his PhD studies in the ICT program, XXXVIII Cycle, focusing on Space-Division Multiplexed (SDM) optical communications. Over the past two years, he has contributed to cutting-edge transmission experiments using advanced optical fibers, including multi-core, multi-mode, and hybrid multi-core multi-mode fibers. His work also extends to ultra-wideband experiments spanning the S-, C-, and L-bands, pushing the boundaries of modern optical communication systems.