

PhD Program of National Interest in TECHNOLOGIES FOR FUNDAMENTAL RESEARCH IN PHYSICS AND ASTROPHYSICS

Academic year 2023/2024

CURRICULUM: Elettronica

Title of the project: New Optical and RF Over Fiber Technologies for New Generation Radio Telescopes

Supervisor: Federico Perini

Description of the research project: The future discoveries of cosmology, astrophysics and space science require the development of highly performing radio telescopes reaching an always increasing sensitivity and resolution. The development of such systems depends on several aspects, including the RF signal transport through optical fibre system toward the back-end processing unit, where signal phase and amplitude variations due to temperature and mechanical stresses must be kept as low as possible within the whole receiving chain. Indeed, this is an important aspect which impacts on the calibration processes, especially in wideband interferometric systems where the back-end unit is placed hundreds of meters or even kilometres far from the antenna. The aim of this Ph.D. project is to investigate and implement innovative solutions for the RF signal transportation starting from the experiences we had with SKA, Medicina VLBI dish, Northern Cross and SRT radio telescopes. Thanks to a multi-year collaboration on this topic with the University of Bologna, the work will be done

Contacts: federico.perini@inaf.it