

Industries producing innovative nano-enabled materials and devices are facing the urgent need of nanoscale strain real-time characterization methods and tools to be introduced within the production line to ensure reliability of the fabrication process. The needed characterization methods for strain analysis must be cost-and-time-effective and suitable for a manufacturing environment, reliable and non-destructive.

The project CHALLENGES – Real-time nano-CHARacterization reLatEd techNoloGiEeS – aims at developing innovative Non-Destructive Techniques (NDTs) for reliable inline multiscale measurements down to the nanoscale, and fully compatible with different factory environments. The developed metrology technologies will enable the increase of speed, resolution, sensitivity, spectral range and compatibility within different nano-related production environments, finally improving products performance, quality and reliability, with the consequent boosting of competitiveness. The CHALLENGES's innovation will be developed exploiting the plasmonic enhancement of optical signals. It will provide a non-destructive approach based on the use of multipurpose nano-optical techniques to enable a reliable real-time nano-scale characterization in the factory floor, using plasmonic enhanced Raman, InfraRed (IR) and Photoluminescence signals.