

# Photonic techniques used in Cultural Heritage conservation

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The paper proposes to present implementation of advanced conservation methodologies for a sustainable preservation strategy applied on stone monuments and historical buildings located in the Bucharest city area and outside. Our expertise always works inside a multidisciplinary consortium created for science application in the benefit of the society. More than that, our institute develops a concerted activity at scientific high level, with innovative character and applicative value based on a professional dissemination plan. The presented innovative procedures are based on the integration of optimized laser techniques for cleaning stone with low invasiveness next to conventional approaches to cleaning, consolidation, and protection treatments. Optimized investigations on laser cleaning of stone decorations are carried on by laser systems operating at different wavelengths (1064nm, 532nm, 355nm, 266nm) in Q-switch regime. A systematic study of laser-material interaction effects on artwork materials was started at our institute for a while and we keep collecting data in order to test stability and the dirt removal possibilities by laser ablation in view of future non-invasive maintenance interventions. Pilot restoration sites were already initialized with end-users from Cultural Heritage conservation domain; scientific field results are always supervised by UAB – Cultural Heritage Conservation Department that is always welcomed with its theoretical studies and laboratory research. Microclimate conditions are part of each scientific field or lab experiment to emphasize the place of an art object inside its microclimate. Thermovision, multispectral imaging and 3D laser scanning of the surfaces are noninvasive, safe and mobile techniques applied to monitor every intervention on an art object and to provide a complete justification the precision and advanced safety of laser techniques. Art restorers, BA and MA students are welcomed for a continuous change of information around CH conservation problems and latest developments in the field. Our continuous research experience is always shared with scientists having the same interest because we believe in common benefit of dissemination seen as a way of progress. The presentation emphasizes Cultural Heritage place as a major factor in modern society development. We consider our research activities having beneficiaries also the monuments themselves, were pilot restoration workshops were already started and future other monuments were the observations and experience may be applied.