Thesis title: “Optically stimulated luminescence (OSL) of beryllium oxide (BeO) and its application in Radiation Dosimetry”

Work description: Optically stimulated luminescence (OSL) is a powerful and growing passive dosimetry technique that provides significant advantages over wide dose ranges. Nature of the stimulation mechanism for the luminescent emission by this technique, and the novelty of the repetition several times in the dose measurements, unlike the thermoluminescence dosimetry technique, make OSL an excellent tool for personal and environmental dosimetry applications. The aim of this thesis is to characterize the response, stability and performance of the promising BeO ceramic material after exposure to external radiation fields, both experimentally and through Monte Carlo simulation models. Research will be promoted to investigate the results provided by the OSL of BeO and compliance with the criteria established in the international standards for passive dosimetry systems. The results obtained will be disseminated through scientific publications and presentations at conferences.

Framework: The doctoral thesis is part of the implementation of a new personal dosimetry system for photons and beta radiation in the CIEMAT External Dosimetry Service that the Ionizing Radiation Dosimetry Unit has recently incorporated within the Recovery, Transformation and Resilience Plan financed by the European Union - NextGenerationEU. The doctoral student will join a group of researchers in ionizing radiation dosimetry who work on the development and application of new systems for measuring ionizing radiation fields (gamma, beta, neutrons). The selected person will have the opportunity to work in collaboration with researchers from other national and international centers.

Thesis Supervisors:
Rafael Rodríguez Jiménez, PhD
Montserrat Moraleda Chaves, PhD
Ionizing Radiation Dosimetry Unit
CIEMAT
rafael.rodriguez@ciemat.es
montse.moraleda@ciemat.es