

Expanding the toolbox for optical manometry and thermometry

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Research on high pressure and/or high temperature have become a fundamental field of theoretical and experimental research spanning all scientific disciplines, from the study of water on planets to the material composition of the Earth's interior and the development of new materials, not to mention applications in our daily lives, such as in food technology [1-3]. High-pressure conditions can be induced in a solid using a diamond anvil cell, while achieving low or high temperatures requires, respectively, a cryostat or a conventional furnace. Determining the pressure and temperature of the material under study is a key issue that requires calibrated standards. Indirect *in situ* calibrations can be performed by exploiting the high sensitivity of the emission lines of various optically active rare earth and transition metal ions to changes in pressure and/or temperature [3]. In this talk, we present different luminescent ions in materials and nanomaterials that have been successfully tested as optical pressure and/or temperature sensors, along with innovative multiparametric approaches for their determination.

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