

A Mix of Thematics

A Journey to the Other Side and Back: A Tale of Research Endeavors Across Institutions.

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In this presentation, I will share my research journey, starting with my work at Instituto Superior Técnico, where I focused on the development of thermally-activated delayed fluorescence (TADF) nanomaterials. TADF emitters exhibit unique properties, including both short and long-lived emissions, as well as inherent sensitivity to oxygen and temperature. By exploring silica and polymeric nanoparticles as carriers for TADF emitters, I developed novel luminescent nanomaterials with potential applications in optical oxygen sensing, time-resolved biological imaging, and the photosensitization of reactive oxygen species.

Since joining LAQV, my research has shifted towards the development of luminescent systems with circularly polarized luminescence (CPL). CPL arises from chiral luminescent molecules that emit light polarized in a specific direction, a property particularly valuable for biological imaging and sensing due to the inherent chirality of biological systems. Additionally, CPL holds significant potential for anticounterfeiting technologies, offering a unique and hard-to-replicate verification signal. My current research focuses on designing organic chiral emitters that undergo aggregation, leading to enhanced luminescence intensity and dissymmetry, and integrating them with cellulose-based materials to create robust and effective anticounterfeiting tags.

In this talk, I will highlight key achievements from my previous work and introduce the future directions of my current project, which aims to innovate within the realm of CPL materials and their practical uses.

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