

Popular-Science Description

Phosphors that emit radiation in the near-infrared (NIR) spectral range are currently finding applications across a wide variety of fields. However, their main limitations are the inherently low emission intensity, which further decreases with increasing temperature. To address these challenges, this project aims to develop a new class of NIR-emitting phosphors with unique properties.

These properties will arise from combining the high sensitivity of transition-metal ions to changes in their structural environment with inorganic host matrices that exhibit unit-cell contraction as the temperature increases. This unique combination is expected not only to enhance the luminescence intensity of such phosphors at elevated temperatures, but also to enable thermal tuning of their emission range.

The successful implementation of this highly ambitious objective will lead to the creation of novel luminescent materials of key importance for night-vision systems as well as for physical and chemical sensing applications.