

Popular Science Description

Luminescence thermometry is a technique that has been intensively developed in recent years because of the unique ability it offers to remotely image temperature without having information about the emissivity of the object under study. This technique is based on the analysis of the change of the properties of the emitted light by phosphors under the influence of temperature changes. The desire to increase the accuracy and precision of temperature readout with the use of luminescent thermometers is a motivation to search for new materials and solutions that can be used for this purpose. There is a group of materials for which a change in temperature causes a reversible change in their crystal structure, i.e. a structural phase transition. Such a change significantly affects the spectroscopic properties of the dopant ion responsible for luminescence. Therefore, this type of material can be used as luminescent thermometers with high sensitivity to temperature change.

This project will develop a strategy to modulate the thermometric performance of luminescent thermometers by modifying the chemical composition of the phosphor. The result of this project will be luminescent thermometers with excellent thermometric parameters.