

**The 6th International Conference on the Physics of Optical Materials and Devices
&
The 5th International Workshop of Persistent and Photostimulable Phosphors**

BOOK OF ABSTRACTS

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ICOM&IWPPP 2022

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Belgrade, Serbia, 29th of August to 2nd of September 2022

Dear Colleagues and Friends,

It is our great pleasure to welcome you for the fifth time to The International Conference on the Physics of Optical Materials and Devices AND the International Workshop of Persistent and Photostimulable Phosphors – ICOM&IWPPP 2022. The conference is organized by the Society for science development of Serbia (Serbia), l'Institut de Recherches de Chimie Paris (France), the CEMHTI University Orléans (France). This meeting is the continuation of a series of ICOM conferences organized every three years starting with Herceg Novi, Montenegro in 2006 and 2009; Belgrade Serbia in 2012, Bečići, Montenegro in 2015 and Igalo in 2018. The last editions of IWPPP were organized in 2011, (Ghent, Belgium), 2013 (Guangzhou, China), 2015 (Arlington, USA), 2018 (Beijing, China).

The ICOM&IWPPP Conference brings together scientists and technology users who investigate or develop materials for optical applications. The conference presents the state of the art in preparation methods, optical characterization, and usage of optical materials and devices in various photonic fields. This year 5 plenary, 9 keynote, 21 invited lectures, 38 oral and 72 poster presentations will be presented in the following sections: Light for sensing, Thin Films and Composites, Exploring Luminescent Systems, Persistent Luminescence Materials, Persistent Luminescence Mechanisms, Tools and Applications of Persistent Phosphors, Design of Optical Thermometers, Phosphors for bio-applications, New Optical Phenomena, Optical Thermometry, Applications of Rare Earth Emissions, Tuning Optical Properties.

We hope that ICOM&IWPPP 2022 will be fruitful in terms of scientific exchange and that it will reinforce the existing collaborations between the participants and promote new ones in the future. We would like to acknowledge financial support given by numerous organizations.

Organizers of the ICOM&IWPPP 2022 wish you a nice time during the conference in Belgrade!

Conference Chairpersons:

Prof. Dr. Miroslav D. Dramićanin,
Prof. Dr. Bruno Viana,
Prof. Dr. Mathieu Allix

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SYNTHESIS AND CHARACTERIZATION OF (Y,Me)NbO₄:Er,Yb PHOSPHORS: INFLUENCE OF LOCAL LATTICE DISORDERS

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Yttrium niobate (YNbO₄) is considered to be a self-activated phosphor with a strong emission band in the blue region originating from the NbO₄³⁻ group, but also an effective host for various luminescent-based doping-altered applications with different rare-earth ions [1-4]. Here, (Y_{0.8-z}Me_z)NbO₄:Er,Yb (z = 0, 0.1, 0.2) phosphors with 0.05 erbium and 0.15 ytterbium as up-conversion (UC) activator and sensitizer, respectively, and different metal ions (Me) replacements of Y³⁺ ions that launch the host local lattice disorders, were synthesized by the traditional solid-state reaction method. The starting metal oxide precursors in the appropriate molar ratio were mixed in a ball mill at 100 rpm for 8 hours, then pre-annealed at 800 °C for 4 hours, and finally annealed at 1200 °C for 4 hours. The morphology of the synthesized phosphors and their particle size and shape were examined by scanning electron microscopy. X-ray diffraction measurements were used to confirm the crystal structure of samples. The emission spectra of Y_{0.8}Er_{0.05}Yb_{0.15}NbO₄ at room temperature under the excitation of 980 nm show green and red visible UC and near-infrared emission bands of very low intensity, which originate from energy transfer UC processes between Yb³⁺ and Er³⁺ ions and which are attributed to (²H_{11/2}, ⁴S_{3/2}) → ⁴I_{15/2}, ⁴F_{9/2} → ⁴I_{15/2}, and ⁴I_{9/2} → ⁴I_{15/2} transitions of Er³⁺ ions, respectively. The lifetime of the ⁴S_{3/2} excited energy level of Er³⁺ in Y_{0.8}Er_{0.05}Yb_{0.15}NbO₄ that depends on the host and plays an essential role in infrared to visible UC is 0.198 ms. UC mechanisms, the intensity of the UC emission, and changes in lifetime caused by different Me-ions entering the host lattice were discussed.

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