



## **Development of lanthanides activated solid materials for photonic, sensing and biomedical applications**

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There is a great deal of research interest in generation of the visible light emitting materials for different photonics, sensing and biological application purposes. One effective way for generating visible emission is the frequency upconversion (UC) in which the absorption of two or more low energy photons (usually NIR) is followed by the emission of high energy photon. The rare earth ions are the suitable candidates for the frequency upconversion owing to their large number of energy levels, narrow emission spectral lines, long lifetime of the excited states, good chemical durability and they can be easily populated by the near-infrared radiations.

Present research is focused on the development of rare-earth/transition metal ions doped/codoped solid materials such as glass, phosphor and thin film via some novel/famous techniques. The optical, structural, thermal and electrical behavior of synthesized materials is the main subject of investigation. The application of developed materials in photonic, sensing and biomedicine will be explored on the basis of observed results.

### **Representing Publications:**

- [1] **Anurag Pandey**, Vineet Kumar Rai, Applied Physics B, 109 (2012) 611.
- [2] Vineet Kumar Rai, **Anurag Pandey**, Riya Dey, Journal of Applied Physics, 113 (2013) 083104.
- [3] **Anurag Pandey**, Vineet Kumar Rai, Dalton Transactions, 42 (2013) 11005.
- [4] Riya Dey, **Anurag Pandey**, Vineet Kumar Rai Sensors and Actuators B, 190 (2014) 512.