

Unveiling all-optical switching phenomenon in selected promising multifunctional advanced materials

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Abstract

Advances in the understanding of nonlinear optical (NLO) properties are crucial and extremely important for the development of new photonic device technologies. Factors such as the chemical composition and structural architecture play a fundamental role in controlling the NLO properties of a given optoelectronic devices. Nonlinear optics play a major role in all optical switching applications. Innovative optoelectronic devices for communications, optical data information storage and optical limiting require an important development of materials based on molecular engineering of advanced molecular systems with exceptional NLO responses. Thus, organic materials, polymeric materials, organometallic or coordination metallic complexes as well as new hybrid organic/inorganic nanocomposites, including self-assembled architectures for nonlinear optical applications have been the subject of both experimental and theoretical investigations during last recent years. In this, talk characterization and modulation of NLO Properties in highly π -Conjugated Organic Compounds and Functionalized Nano composites. NLO properties of some selected supramolecular systems will be also discussed in view of their optoelectronic applications in advanced photonics technologies ^[4] using powerful experimental techniques tools such as SHG, THG, and Z-Scan. Moreover, some interesting experimental results on anisotropic confinement of chromophores that induces second-order nonlinear optics in nanoporous photonic smart membranes will be also discussed.

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Recent Publications:

1. A. Szukalski, P. Krawczyk, B. Sahraoui, F. Rosińska, and B. Jędrzejewska; The Journal of Organic Chemistry, 87, 7319–7332 (2022)
2. A. Szukalski, P. Krawczyk, B. Sahraoui, and B. Jędrzejewska; The Journal of Physical Chemistry B, J. Phys. Chem. B, 126, 1742–1757 (2022)
3. Waszkowska, K. ; Cheret, Y. ; Zawadzka, A.; Korcala, A. El-Ghayoury, A.; Migalska-Zalas, A.; and Sahraoui, B. Dyes And Pigments Volume: 186 , N° 109036 (2021)
4. Szukalski, A, Korbut, S. Zielinska, B. Sahraoui, Optical Materials, Volume 147, 114766 (2024)
5. Adam Szukalski, Yohan Cheret, Anna M. Grabarz, Abdelkrim El-Ghayoury, and Bouchta Sahraoui Adv. Optical Mater. 2402946 (2024)

Biography



Bouchta SAHRAOUI, Distinguished full Professor at Angers University, is a member of the [Photonics Laboratory](#) and a Member of the Hassan II Academy of Science and Technology, Morocco. His research focuses on the development of innovative materials for advanced optoelectronic applications. As an expert in nonlinear optics, he explores the properties of materials to design high-performance photonic and electro-optical devices that meet today's technological challenges. He organized 25 prestigious conferences as a chair or co-chair, he published **460** peer-reviewed publications, with 8900 citations and his Hirsch-index is currently **62** according to [Google scholar](#). He is a member of the editorial boards of 5 prestigious journals, guest editor of **12** special issues on energy and photonics applications. He supervised **22** PhD candidates. He presented more than **50** invited and plenary lectures. He conducted or is involved in **8** European collaborative projects and received **6** awards from the French Ministry of Research and Innovation for his outstanding contributions.

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