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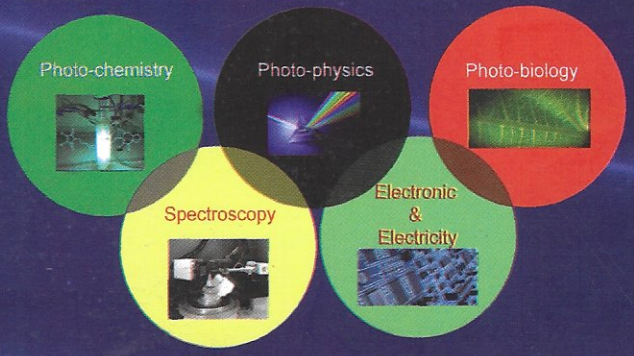

Venue
Golden Jubilee Hall

Organized by

Department of Chemistry

(School of Chemical Sciences & Technology)

Dr. H. S. Gour Vishwavidyalaya

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Sagar-470003 (MP), India

United Nations Educational, Scientific and Cultural Organization

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HLMMD – IYL 2015

PROGRAMME & ABSTRACTS

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DIATOM FRUSTULES AS PHOTO-REGULATORS OF DIATOM PHOTOBIOLOGY

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The tiny sea jewels, diatoms, are unicellular microscopic algae with inorganic cell walls called "frustules", which are made of hydrated silica. Beside other interesting facts about diatoms, their frustules show amazing optical properties including light focusing in centric diatoms [1], photonic crystal modes [2] and UV-induced photoluminescence properties [3]. Such properties may have certain functions in diatom photobiology. The frustules may be involved in photo-regulation processes that keep the photosynthetically active radiation near chloroplasts and protect them from harmful wavelengths and high intensities. Moreover the frustule may play a role in dim light environments as they redistribute the light inside the cell [4]. Such optical properties may help in light communication and sharing in colonial diatoms. Due to these reasons, manipulation of the optical properties of diatom frustules may lead to more efficient solar energy harvesters [5], with diatom solar panels proposed for production of both electricity and biofuel [6]. The power of diatoms to work with light is both fascinating in itself and a source of new technologies.

Keywords: Diatom, photobiology, natural silica, optical properties.

References:

[1] Lavanga et al. (2014). *Proc. SPIE 8999, Complex Light and Optical Forces VIII*. 899916.

[2] Fuhrmann et al. (2004). *Applied Physics B-Lasers and Optics*. 78(3-4), 257-260.

[3] Mazumder et al. (2010).*Indian J. Phys*. **84** (6), 665-669.

[4] Noyes et al.(2008). *Journal of Materials Research*. 23(12), 3229-3235.

[5] Jeffryes et al.(2011). *Energy & Environmental Science*. 4(10), 3930-3941.

[6] Vandana et al.(*2015). Marine drugs*. 13(5): 2629-2665.

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