

LAB INCHARGE:-

Dr. D. Goswami

1. General

Name of the lab	Ultrafast Laser Laboratory
Location	SL 216
Phone number	7187

2. Research areas

Sl no	Research areas
1	Femtosecond Pulse Shaping
2	Nonlinear Spectroscopy
3	Quantum Computing
4	Coherent Control
5	Development of Optical Analogue of MRI
6	Multidimensional Spectroscopy

3. Facilities in the lab(equipments/workstations etc)

Sl no	Name of equipment/workstation/software etc	Quantity
1	Pentium 4 workstations	6
2	MATLAB	3
3	NI LabView	1
4	Protel	1
5	Altium	1
6	Gaussian	1
7	Ti-Sapphire Laser	2
8	Arbitrary Wave form Generator	1
9	Time delay and Synchronizing Circuits	2
10	Beam Chamber	1

4. Ongoing projects

Sl no	Ongoing project name
1	Quantum Computing with Ultrafast Pulse Shaping technology (MCIT, 2002-2007)
2	High Resolution IR Imaging Instrument for Cancer Diagnostics

	and Their possible elimination (Wellcome Trust fellowship, 2004-2009)
3	Coherent Control with Ultrafast Pulse Shaping (DST Swarnajayanti fellowship, 2004-2009)
4	FAB Lab Project

5. 10 most significant of the recent publications –

Sl no	Paper title	Journal name and issue
1	“Adiabatic Quantum Computation: Coherent Control Back Action”, D. Goswami,	<i>Quantum Computation Back Action 2006</i> , AIP Proceedings 864 , Refereed Volume edited by D. Goswami, AIP Press, New York (2006) pp273-294.
2	p Smaragdyrin Molecular Conjugates with Aromatic Phenylacetylenes and Ferrocenes; Syntheses, Electrochemical and Photonic Properties”, R. Misra, R. Kumar, T. K. Chandrashekar, C. H. Suresh, A. Nag and D. Goswami,	<i>Journal of The American Chemical Society</i> 128 (50) 16083-16091 (2006).
3	“On the practicality of Adiabatic Quantum Computing with Optical Schemes”, Debabrata Goswami,	<i>Int. Jour. of Quantum Information</i> 5 (1-2) 179-188 (2007).
4	“Ultrafast Pulse Shaping Developments for Quantum Computation”, S.K. Karthick Kumar and Debabrata Goswami,	<i>Current Topics in Atomic, Molecular and Optical Physics</i> , World Scientific Publishing Co., Singapore (2007) 133-142.
5	“Ultrafast Pulse Shaping Developments for Quantum Computation”, S.K. Karthick Kumar and Debabrata Goswami,	<i>Current Topics in Atomic, Molecular and Optical Physics</i> , World Scientific Publishing Co., Singapore (2007) 133-142.
6	“Probing Coherence Aspects of Adiabatic Quantum Computation and Control”, Debabrata Goswami	<i>J. Chem. Phys.</i> (submitted).
7	“Sensitive Technique for Two-photon Absorption and Fluorescence Enhancement:	<i>JACS</i> (submitted).

	Towards Better Live Cell Imaging”, A. Nag, A.K. De, D. Goswami,	
8	“Exploring Novel Bioimaging and Alternative Schemes to Computing through Femtosecond Laser Pulse Modulation”, Debabrata Goswami,	<i>International Reviews in Physical Chemistry</i> (invited article—in preparation)
9	“Aromatic core modified decaphyrins with the largest two-photon absorption cross-sections: Syntheses and characterization” H. Rath, V. Prabhuraja, T. K. Chandrashekar, A. Nag, D. Goswami, B. S. Joshi,	<i>Organic Letters</i> 8 (11) 2325-2328 (2006).
10	Zinc(II)- and copper(I)-mediated large two-photon absorption cross sections in a bis-cinnamaldiminato Schiff base”, Sanjib Das, Amit Nag, Debabrata Goswami and Parimal K. Bharadwaj,	<i>Journal of the American Chemical Society</i> , 128 (2), 402-403 (2006).