CENTER FOR LASERS AND PHOTONICS

PHOTONICS SCIENCE AND ENGINEERING PROGRAMME

(Since 1988)

Specializations

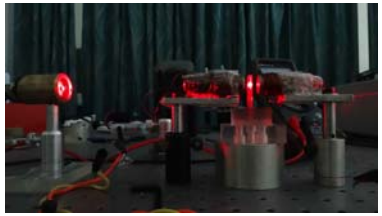
- High resolution laser spectroscopy
- Non-linear optics
- Optical communication
- Laser plasma studies
- Medical applications of lasers
- Photonic devices
- Electro-optic materials and devices

About CELP

The Center for Lasers and Photonics (CELP) is geared towards research in various specialized applications of lasers like laser spectroscopy, laser-plasma studies, ultrafast phenomena, bio-medical optics optics, photonic devices, semiconductor lasers, interferometric tomography, optical networks, particle image velocimetry, laser schlieren, etc.

It offers Masters and PhD in Photonics Science and Engineering Program (PSEP) which is an interdisciplinary research program aimed at producing laser scientists to meet the growing need for expertise in the field of lasers and its applications.

Its objective is to train young engineering and science graduates for providing skilled manpower in the specialised field of lasers and photonics. It provides the necessary theoretical and experimental background in lasers, quantum optics, and various laser applications such as optical communications/networks & switching, holography, material processing, materials and biomedical spectroscopy, flow/temperature & stress analysis, optical signal processing and optoelectronic integration.



Foundation of CELP: Initiating Research & Teaching Programmes

Dr. P Venketaswarlu

Research on lasers was initiated at IIT Kanpur as early as 1961 under the leadership of Dr. P. Venketaswarlu [1]. Initially commercial ruby lasers were being used for the study of stimulated Raman scattering. At the same time, an in-house multidisciplinary (Physics, Electrical Engineering and Chemical Engineering) effort was started to develop laboratory model lasers for fluorescence and lifetime studies.

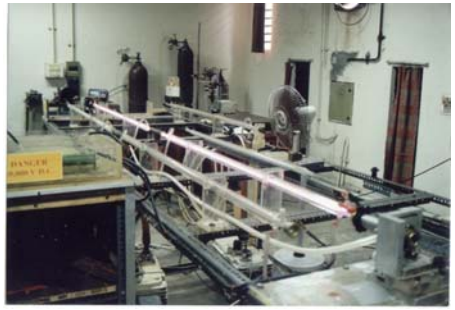
In 1988 all the activities in laser related fields at IIT Kanpur were bought under a single umbrella with the creation of 'Centre for Laser Technology (CELT)'. CELT initially offered Masters in 'Laser Technology Programme (LTP)'. In 2012, PhD programme was also included in CELT.

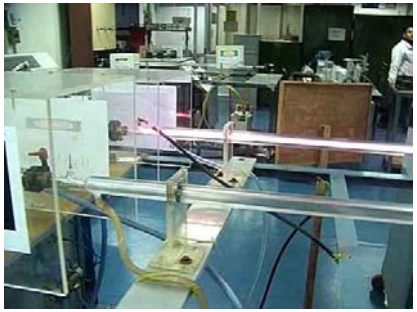
Towards Top Research Programmes: Years of Consolidation

Dr. R R Dasari

Dr. Bansilal

Along with Dr. Venkatewarlu, Dr. Ramachandra Rao Dasari, professor at IIT Kanpur from 1962–1978, contributed a lot in the research on lasers which led to building one of the largest laser laboratories for university research in India [2]. His PhD student Dr. Bansilal (later joined CELT as Chief Scientific Officer) led the implementation of laboratory models of several lasers: 1-20mW He-Ne lasers, 300mW CW Ar-ion laser, 100W CW CO2 laser, 20mW He-Cd laser, N2 laser pumped dye laser with single prism beam expander [3].

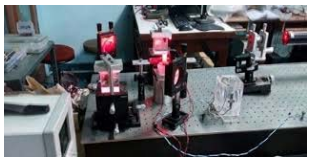




First 100 W CO2 laser fabricated at CELT

Later in 2013, the CELT was renamed to Center for Lasers and Photonics and LTP was converted to Photonics Science and Engineering Programme.

Later models of Ar-ion, nitrogen, Cu-Vapor, Ar-ion pumped dye and Cd-plasma recombination lasers were also fabricated at CELP.



Tunable Micro Dye laser system

Cd-plasma recombination laser

Foundation of three decades

Over the last three decades, CELP has grown to be an esteemed name in the field of laser and optics research in the country. It owes its success in quality teaching and research programme. Till date more than 180 undergraduate students have graduated in its Masters Programmes and 12 postgraduate students have registered in PhD since 2012 [4]. The team of faculty members includes Profs. U Das, R.K. Thareja, D. Goswami, A. Pradhan, P. K. Panigrahi, K. Muralidhar, D. P. Mishra, R. Vijaya, Pradeep Kumar Krishnamurthy, H. Wanare, B. Lohani, S. Kamle, N. Naik, G. Rajshekhar and S. M. Tripathi. CELP has a well-established lab to train its students about the basic laser systems. Also, each faculty member possess his/her own lab where high quality research is carried out.

CELP has always aimed at training young professionals in different aspects of photonics and has played a significant role in bringing an evolution in the country in the area of laser research. It hopes to continue to provide new directions for the coming generations with the blend of its research and teaching commitments.

References:

1. https://www.iitk.ac.in/phy
2. http://web.mit.edu/spectroscopy
3. http://home.iitk.ac.in/ bansi
4. http://www.iitk.ac.in/celt/

Contact Information:

http://www.iitk.ac.in/celt; +91 512-259 7341

Prepared by:

ANKITA JAIN (14116261, PhD, CELP)