

pendent while at higher fluences the transmitted energy stays constant independent of the incident fluence. Using the second harmonic of a home-made Q-switched Nd:Glass laser oscillator-amplifier system we have investigated this phenomena in considerable detail. Angle and time resolved studies on various solutions of C₆₀ and C₇₀ by our group have shown that the thermally induced nonlinear scattering plays an important role (Fig. 2). One of the attractions of fullerenes as nonlinear material is that unlike other organics they do not have hydrogen and hence are expected to have relatively low residual absorption coefficient due to multiphoton absorption. Using a relatively large (1mm x 3mm) single crystal of C₆₀ grown at Anna University we found that the crystal had a linear absorption coefficient of $\sim 7\text{cm}^{-1}$ compared to 6cm^{-1} measured for thin films, a two-photon absorption coefficient of $18\text{cm}^2/\text{GW}$ and a surface damage threshold $\sim 40\text{GW}/\text{cm}^2$. All these measurements were performed at CAT with a 6 ps laser at 1054 nm.

As mentioned above, the experimental facilities in the nonlinear optics group at CAT are centred around two home-made Nd:glass lasers — one Q-switched to give 40

ns pulses and the other active-passive mode locked to give 6 ps pulses. We also have a home made Ar-ion laser for Raman Spectroscopy. With the Nd:glass lasers, we can characterise nonlinear optical materials for frequency conversion at various stages — by electric field induced second harmonic generation at the molecular level, by powder second harmonic generation at powder level and finally by measurement of second harmonic efficiency when a cut and polished single crystal is available. These facilities are now being augmented with three new lasers. These are a Nd:YAG Q-switched laser obtained from the Production Unit of CAT, and two commercial lasers — a sub-picosecond Ti-Sapphire laser and an Ar-ion laser pumped CW dye laser.

To summarize, we have been investigating nonlinear optical response of a variety of quantum confined systems. With the availability of high repetition rate lasers in the near future, we expect to contribute significantly to the development of nonlinear optical materials and devices.

K C Rustagi

CONFERENCES / WORKSHOPS

National Laser Symposium

The annual National Laser Symposium was held at CAT this year from January 29 to February 1, 1994.

The large number of contributed research papers (totalling 158) covered almost all facets of Laser Science and Technology, and were of very high quality. Apart from these papers, there were eight "Thesis presentations" by young research scientists. A Proceedings for the symposium has been published in which these papers and the theses are presented in an extended abstract form.

The Symposium had twelve invited talks on topical subjects presented by leading laser scientists. Most of the research papers were covered in poster sessions, except the session "Laser Applications to Biology and Medicine". This was a special session and was well attended by Doctors and Researchers active in this upcoming field in India.

Another interesting feature of the Symposium was the exhibition. About twenty companies exhibited a large range of products from lasers to optical components and various testing and measuring instruments. A heartening feature was that many companies are now able to supply indigenously built He-Ne Lasers, optical components and optical mounts.

Apart from these activities, there was a session for visit to the laboratories at CAT and one evening devoted to General Body Meeting of the Indian Laser Association.

National Workshop on Recent Advances in Quantum Optics, and National School on Modern Optics

A National Workshop on Recent Advances in Quantum Optics (RAQUO-94) was organised at CAT during March 7 - 10, 1994. It was attended by about seventyfive scientists. The Workshop covered a wide range of topics in quantum optics and related areas. There were about twenty invited talks, and about the same number of contributed papers. Amongst the invited speakers were Dr P D Gupta and KS Bindra from CAT. An open discussion on "Outlook of experiments in quantum optics in India" was held during the Workshop.

Preceding the Workshop, a "National School on Modern Optics", mainly targeted at post-graduate students, was held during March 3 - 5, 1994. The purpose of the School was to familiarise students with various advances in the field of modern optics, so that they could gain maximum out of RAQUO-94. The school had lectures on the following topics: Introduction to quantum optics, nonlinear optics, QED in cavities, and quantum chaos.



हिन्दी में आयोजित वैज्ञानिक संगोष्ठी

इस केंद्र में 'परा-उच्च निर्वात - विज्ञान, तकनीक एवं अनुप्रयोग' विषय पर 5 फरवरी 1994 को एक-दिवसीय वैज्ञानिक संगोष्ठी आयोजित की गई। केंद्र द्वारा वैज्ञानिक विषय पर हिन्दी में आयोजित की जाने वाली यह चौथी संगोष्ठी थी।

समारोह की अध्यक्षता केंद्र निदेशक डॉ. भवालकर ने की। उन्होंने कहा कि देश में विकसित की जा रही प्रौद्योगिकी के सामयिक और समुचित स्तर पर निर्बाध रूप में हस्तांतरण हेतु प्रौद्योगिकी प्रलेखन की दिशा में पर्याप्त प्रयास किए जाने की आवश्यकता है। इस प्रयास के अभाव में, प्रयोगशाला में विकसित उन्नत प्रौद्योगिकी काफी समय तक उपयोगकर्ताओं और उद्योगों के बीच नहीं पहुँच पाती है। फलस्वरूप, प्रौद्योगिकी के क्षेत्र में देश में हुई उन्नति का कभी-कभी ठीक अहसास नहीं हो पाता।

प्रगत प्रौद्योगिकी केंद्र में अनुसंधान और विकास कार्यों का संक्षिप्त उल्लेख करते हुए डॉ. भवालकर ने यह जानकारी दी कि केंद्र में विकसित एवं निर्मित एक करोड़ रुपये से अधिक के उपकरण यूरोपीय नाभिकीय अनुसंधान संस्था 'सी.ई.आर.एन.' को प्रायोगिक प्रयोजनों के लिए भेजे जा रहे हैं। उन्होंने कहा कि देश में प्रौद्योगिकी के विकास अनुसंधान प्रयत्नों के ठीक उपयोग के लिए यह आवश्यक है कि ऐसे उद्योग एवं संस्थाएँ सामने आएँ जो विकसित प्रौद्योगिकी को ग्रहण करने में सक्षम हों।

प्रसिद्ध उद्योगपति श्री इन्द्र शांति स्वरूप गजरा, प्रबंध निदेशक, गजरा बेविल गियर्स लिमिटेड, देवास इस गोष्ठी में मुख्य अतिथि थे। उन्होंने अनुसंधानकर्ताओं एवं प्रयोगकर्ताओं में निरंतर समन्वय की आवश्यकता पर जोर डाला। गोष्ठी के प्रारंभ में, अतिथियों का स्वागत करते हुए सहायक निदेशक (राजभाषा), श्री सुनील सरवाही ने, सामाजिक स्वीकार्यता की दृष्टि से प्रौद्योगिकी और भाषा के विषय में अपने विचार व्यक्त किए। श्री सत्यनारायण व्यास, वैज्ञानिक अधिकारी एवं अध्यक्ष, राजभाषा कार्यान्वयन समिति ने संगोष्ठी के विषय के महत्व पर प्रकाश डाला।

गोष्ठी के तीन तकनीकी सत्रों में इस केंद्र से सर्वश्री ए.एस.राजाराव, आर.जे.पटेल, एस.टी.भावसार, मोहन पंडियार व भाभा परमाणु अनुसंधान केंद्र से श्री पी.बी.देसाई और डॉ. डी.आर.बोंगीरवार तथा डॉ.टी.एस.श्रीपति ने निर्वात संबंधित विभिन्न पहलुओं पर हिन्दी में अपने व्याख्यान दिए।

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