



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।

PUBLICATIONS

In Journals

1. "Spectral distribution of x-ray yield of the M-shell emission from laser produced gold plasma", P A Naik, P D Gupta, and S R Kumbhare, IEEE Transactions on Plasma Science, 22, 53 (1994).
2. "Interferometric determination of thickness of free-standing sub-micron formvar films", R P Shukla, A Chowdhury, and P D Gupta, Optical Engg., 33, June 1994.
3. "Operational Characteristics of a pulser sustained de-excited transverse flow CW CO₂ laser of 5 kW output power", A K Nath, L Abhinandan, P Choudhury, Optical Engg., 33, June 1994.
4. "Optimization study of a UV preionized TEA CO₂ Laser", Manoj Kumar and A K Nath, Optical Engg., 33, June 1994.
5. "Analysis of the temporal and spatial characteristics of the output from short inversion time self terminating lasers with various resonators", S K Dixit, B Singh, J K Mittal, R Choube and R Bhatnagar, Optical Engg., 33, June 1994.
6. "A transistorized Marx bank circuit providing sub-nanosecond high voltage pulses", V N Rai, M Shukla and R K Khardekar, Meas. Sci. Technol., 5, 447 (1994).
7. "A high voltage pulser circuit with sub-nanosecond rise time", V N Rai and M Shukla, Rev. Sci. Instrum., 65, May 1994.
8. "Inertial confinement fusion-part I", Tara Desai, Physics Education, 10, 379, (1994).
9. "Generation of harmonic radiation using the multi-cavity free-electron laser", S Krishnagopal and A M Sessler, Nucl. Instr. Methods A, 341, 331 (1994).

10. "Electric dipole polarizabilities for helium like ions from correlated wavefunction: A density functional approach", M K Harbola, Chem. Phys. Lett. **217**, 461 (1994).
11. "Morphology of self supporting porous silicon layers", R M Vadjikar, R V Nandedkar, D D Bhawalkar, S Venkatachalam, A Dussani and A N Chandorkar, J. Mat. Sci. Lett., **13**, 222 (1994).
12. "Chemical treatment of photoluminescent porous silicon", R M Vadjikar, B Jain, P K Gupta, R V Nandedkar, D D Bhawalkar, M J Patni, R Srinivasan and A N Chandorkar, Mat. Sci. & Engg. B, **23**, L13 (1994).
13. "Optical design of a toroidal grating monochromator based beam line on Indus-1", K J S Sawhney and R V Nandedkar, Pramana, **42**, 49 (1994).
14. "Anomalous low-field magnetic behaviour of polycrystalline URu₂Si₂", S B Roy, A K Pradhan and P Chaddah, J Phys : Condens. Matter, **6**, 253 (1994).
15. "Possibility of a magnetic transition in ZrV₂", S B Roy, A K Pradhan and P Chaddah, Solid State Commun., **91**, 227 (1994).
16. "Magnetic properties of single-crystal Bi₂Sr₂CaCu₂O_{8+y}: experimental evidence of a dimensional crossover", A K Pradhan, S B Roy, P Chaddah, C Chen and B M Wanklyn, Phys. Rev. B, **49**, 12984 (1994).
17. "Magnetic anomaly in Y_{1-x}Pr_xBa₂Cu₃O_{7-y} crystals", A K Pradhan, S B Roy, P Chaddah, C Chen and B M Wanklyn, Physica C, **225**, 369 (1994).
18. "Flux penetration in spheroid samples - critical state model with field dependent critical current density", K V Bhagwat and P Chaddah, Physica C, **224**, 155 (1994).
19. "Paramagnetic-to-antiferromagnetic transition in UCu₂Ge₂: magnetoresistance study", A K Nigam, S B Roy and G Chandra, Phys. Rev. B, **49**, 1127 (1994).
20. "Stark spectroscopy of ¹³CD₃OH with the HCN laser", G R Sudhakaran, M Jackson, R M Lees, L H Xu and I Mukhopadhyay, Infrared Physics, **34**, 661 (1993).
21. "FIR laser Stark spectroscopy of CH₃¹⁸OH", M Jackson, G R Sudhakaran, A Silveira Jr, R M Lees and I Mukhopadhyay, J Mol. Spect., **164**, 275 (1994).
22. "Design and fabrication of a clean vacuum degassing furnace", Rajveer Singh, S N Singh and A S Raja Rao, Bull. Indian Vacuum Society, **25**, 3 (1994).
5. "High resolution spectroscopy of the OCD-bending mode of methanol-D₁ and assignments of far infrared laser lines", I Mukhopadhyay and P K Gupta, Int. Conf. on Millimeter and Submillimeter Waves and Applications, San Diego, California, USA, January 10-14, 1994. (SPIE Vol. 2250, pp.34-36)
6. "Assignments and predictions of optically far infrared laser lines in C-13 methanol", I Mukhopadhyay and P K Gupta, Int. Conf. on Millimeter and Submillimeter Waves and Applications, San Diego, California, USA, January 10-14, 1994. (SPIE Vol. 2250, pp. 31-33)
7. "Effect of N₂ laser irradiation on the skin of the scrotal area of albino rabbits", A Sharma, P K Gupta, S Agnihotri and S Sachdeva, in Int. Conf. on recent advances in bio-medical engineering, January 6-8, 1994, Osmania University, Hyderabad. Published in "Recent advances in bio-medical engineering" ed. D C Reddy, Tata McGraw Hall, New Delhi, 290 (1994).
8. "Effects of N₂ laser irradiation on the scrotal skin of Indian albino rabbits", A Sharma, P K Gupta, S Agnihotri, S Sachdeva and N Agarwal, at Congress organised by Int. Laser Therapy Association and Int. Society for Low power laser application in medicine, May 5-7, 1994, Barcelona, Spain.
9. "Stark spectroscopy using the water vapor laser", M Jackson, G R Sudhakaran, R M Lees and I Mukhopadhyay, 49th Int. Symposium on Molecular Spectroscopy, Ohio State University, USA, June 13-17, 1994.
10. "Shape memory alloys and smart structures", V K Wadhawan, invited talk at Int. Conf. on Advances in Physical Metallurgy, Bombay, March 9-11, 1994.
11. "Intense x-ray generation from laser produced plasmas and its potential applications", P D Gupta, invited talk at National Laser Symposium, CAT, Jan. 29 - Feb. 1, 1994.
12. "Optical limiter", S C Mehendale, invited talk, *ibid*.
13. "X-ray contact microscopic imaging of biological specimen using a laser produced plasma x-ray source", J A Chakera, Yu Geondgian, V V Sarokin, V Yu Korol, V Ya Kuznecov, P D Gupta, and V P Avtonomov, *ibid*.
14. "Study of coupling efficiency and uniformity of pumping in multi-elliptical and cylindrical cavities for a Nd:glass laser amplifier", J A Chakera, A Chowdhury, S R Kumbhare, P A Naik, and P D Gupta, *ibid*.
15. "Performance optimization study of a Faraday optical isolator for a high power Nd:phosphate glass laser chain", S Sailaja, S R Kumbhare, J A Chakera, and P D Gupta, *ibid*.
16. "Study of OG effect in cw CO₂ laser oscillator", M M Nagarkar and P K Gupta, *ibid*.
17. "On the application of high resolution spectroscopy to far infrared laser assignment of C-13 methanol", I Mukhopadhyay and P K Gupta, *ibid*.

Papers in Conferences / Symposia

1. "Optical computing", K C Rustagi, invited talk at the 81st Session of the Indian Science Congress, Jaipur 1994.
2. "Laser-an introduction", D D Bhawalkar, *ibid*.
3. "Ultrafast lasers and their applications", S M Oak, invited talk, *ibid*.
4. "Synchrotron radiation sources Indus-1 and Indus-2", S S Ramamurthi and G Singh, Asian Forum on Synchrotron Radiation, May 13, 1994, Kobe, Japan.

18. "A high voltage resonant current regulated power supply for cw CO₂ laser", N Vyas, C Rajan, M M Nagarkar, A G Bhujle and P K Gupta, *ibid.*
19. "Effect of He-Ne laser irradiation on the respiratory components of E-coli", A Dube, P K Gupta and S Bharti, *ibid.*
20. "Autofluorescence spectroscopy of malignant and normal human tissues", P K Gupta, S Majumder, A Uppal, A Dubey, B Jain and A G Bhujle, *ibid.*
21. "A compact high power transverse flow CW CO₂ laser", A K Nath, L Abhinandan, P Choudhary and R Sreedhar, *ibid.*
22. "Scaling of output power from 2.5 kW to 5.0 kW in a transverse flow cw CO₂ laser", A K Nath, L Abhinandan, P Choudhary and T Reghu, *ibid.*
23. "Charge transfer process in two connected magnetic pulse compression stages", P Choudhary, M S Agrawal and A K Nath, *ibid.*
24. "Performance of a high power transverse flow CW CO₂ laser in mild steel cutting", A K Nath and Harish Kumar, *ibid.*
25. "Laser surface hardening of different types of steel and their characteristics", K Kannan, K Subramanian, S Natarajan, K Sankaranarayanan, S Ganesan, L Abhinandan, Harish Kumar and A K Nath, *ibid.*
26. "Study of laser surface hardening of 0.4% carbon steel", A K Nath, M K Mitra, A Bhattacharya, B Chowdhary, S P Choudhuri and A Bose, *ibid.*
27. "Detection of phase transition using photopyroelectric technique: application to C₆₀ films", Shailendra Kumar, A Bharathi, Y Hariharan and C S Sundar, *ibid.*
28. "Visible photoluminescence from porous silicon", R M Vadjikar, R V Nandedkar and D D Bhawalkar, *ibid.*
29. "Design, fabrication and testing of a longitudinal mode electro-optic modulator using KDP crystal", V S Tiwari and V K Wadhawan, *ibid.*
30. "Growth and characterization of KDP crystals, and fabrication of type I and type II second harmonic generation cells", U N Roy and V K Wadhawan, *ibid.*
31. "Growth of device quality LiNbO₃ single crystals", K S Bartwal, *ibid.*
32. "Characterization of a new NLO crystal - boro KDP", G C Bhar, P K Datta, U N Roy and A M Rudra, *ibid.*
33. "Comparative study of efficient SHG in different UV-VIS-NIR crystals", U Chatterjee, A M Rudra, P K Datta, G C Bhar, U N Roy and V K Wadhawan, *ibid.*
34. "Laser ablation induced stress wave measurement in material", V N Rai, T Desai, Y B S R Prasad, M Shukla and H C Pant, *ibid.*
35. "Multigroup radiation hydrodynamic studies in laser produced plasma", V K Senecha, N K Gupta, T Desai, Y B S R Prasad and H C Pant, *ibid.*
36. "Numerical simulation of penumbral imaging of laser plasma for hard x-ray and implementation of Wiener reconstruction technique", R K Khardekar, V Govil, H C Pant and D D Bhawalkar, *ibid.*
37. "Development of a picosecond optical streak camera and observation of self sustained oscillation in GaAs laser diode emission", V N Rai, M Shukla, H C Pant and D D Bhawalkar, *ibid.*
38. "Short pulse generation from copper vapor laser", J K Mittal, S K Dixit, B Singh and R Bhatnagar, *ibid.*
39. "Collinear three wavelength operation of a copper vapor laser pumped dye laser", R Khare, S R Daulatabad and R Bhatnagar, *ibid.*
40. "Profile monitor for laser beam parameter measurements", H S Vora, S V Nakhe, K K Sharangpani, P Saxena, R Bhatnagar and N K Shirke, *ibid.*
41. "A pulser circuit using magnetic pulse compression", U Nundy, P Choudhury, M Sajeev Mohan and R Arya, *ibid.*
42. "Performance of a UV preionized XeCl excimer laser", P Bhatnagar, B Singh and U Nundy, *ibid.*
43. "Intelligent process control unit and simulator for copper vapor laser", P Saxena, S V Nakhe, H S Vora, K K Sharangpani, R Bhatnagar and N D Shirke, Symposium on advances in control and instrumentation, March 16-18, BARC, Bombay.
44. "Parallel algorithm for query optimization for a computerized system developed using a data base management system", Anil Rawat and Alka Shukla, Supercomputing for Scientific Visualization, (SSV '94), Indian Physics Association, BARC, Bombay, February 15 - 17, 1994.
45. "Parallel algorithm for query optimization for distributed data base on multi-processor computer machines", Anil Rawat, 9th M.P. Young Scientist Congress 1994, M P Council of Science & Technology, Sir Hari Singh Gour Vishwavidyalaya, Sagar, February 28 to March 2 1994.
46. "Problems and solutions for multi-lingual data storage and retrieval in a relational data base management system under UNIX operating system", Anil Rawat and Alka Shukla, Int. Conf. on Application of Information Technology in South Asian Languages, Computer Society of India, New Delhi, February 25 - 26, 1994.
47. "Disk mirroring for database applications", invited talk by Anil Rawat, National Seminar on Distributed Systems, Computer Society of India, Indore Chapter, Sh G S Inst. of Tech. & Sci., Indore, April 12-13, 1994.
48. "Integrated mailing system", P H V S Swamy and A K Gupta, *ibid.*
49. "Image enhancement using second order non-linear filter", Alpna Rajan, A K Gupta, S Pandit, and M B Meenavathi, Workshop on Image Processing and

Analysis, IGISS, IGCAR, Madras, February 22 - 24, 1994.

50. "Image storage & retrieval in multi-user database", A K Gupta, Alpana Rajan, *ibid.*

51. "Office automation", invited talk by Anil Rawat, Winter School on Modern Trends in Computer based automat-

ion Indian Society for technical education, Sh G S Inst. of Tech. & Sci., Indore, January 3 - 14, 1994.

52. "Introduction to multimedia and virtual reality", invited talk by A K Gupta, *ibid.*

OTHER ACTIVITIES / NEWS



National Science Day 1994

CAT observed National Science Day by keeping all the laboratories open to students on February 26, 1994. About 850 students of science discipline of class XI from 28 schools in and around Indore, and final year B Sc students of colleges in Indore, visited CAT. They were accompanied by about 100 teachers. Dr D D Bhawalkar, Director, CAT welcomed and addressed the young visitors. He also invited essays from students on their visit to CAT and eleven prizes were subsequently announced for essays in Hindi and English. The students visited Indus-1 synchrotron accelerator under construction, laser laboratories, and the computer centre. The students were thrilled to see the research and development being carried out at CAT.

Snippets

- Shri Anil Rawat was awarded M P Young Scientist Award - 1994 at the 9th M P Young Scientist Congress held at Sir Hari Singh Gour Vishwavidyalaya, Sagar, during February 28 - March 2, 1994.
- Dr D D Bhawalkar, Director CAT, was invited to deliver the 5th S C Sirkar Memorial Lecture at Calcutta by the Indian Association for Cultivation of Science. He was also invited to deliver the Prof P A Pandya Endowment Lecture organised by the Indian Physics Association (Baroda Chapter), and the Guha Memorial Lecture organised by M P Council for Science and Technology, at Sagar.

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