give seminars on optical nonlinearities in composite materials and quantum dots at Kaiserslautern, Stutgart and Karlsruhe.

Dr. M. Thirumaleshwar participated in the international cryogenic engineering conference at Southampton, UK and presented two papers.

Miss Deepa Angal attended the general accelerator physics course organised by CERN Accelerator school in Spain.

Mr. B. Singh visited National Research Council of Canada, Ottawa under BOYSCAST (Better opportunities for young scientists in chosen areas of science and technology) programme of DST , New Delhi. He was associated with the development of excimer lasers.

Publications.

Papers

1. 'Studies on hydrodynamics of laser irradiated plan on solid targets'.
D.D. Bhawalkar, L.J. Dhareshwar, and H.C. Pant.(Invited paper for special issue of Romanian journal of physics to commemorate 60th anniversary of Prof. Ursu)

2. **'Design of INDUS-I '.**
G.Singh ,G.K. Sahoo, D. Angal, B. Singh and S.S. Ramamurthi. (Paper presented at the International conference on 'Synchrotron Radiation-88' held at Novosibirsk, USSR in Aug. 88.)

3. 'Laser-a versatile tool'.
S.C. Mehendale and K.C. Rustagi (A popular article written in response to an invitation from the Editor , Impact of science on society , published by UNESCO).

4. **'Indigeneous development of In dustrial Accelerators'.**
S.S. Ramamurthi , S.C. Bapna , H.C. Soni and S.Kotiah. (Paper presented at Indo-USSR Seminar on Industrial Applications of electron Accelerators at BARC, Bombay from, Nov. 1-3, 88.)

Internal Reports

1. **'Matching in accelerators'.**
B. Singh, D. Angal and G. Singh, CAT / I / 88-3.

2. 'Magnet field mapping system for SRS facility'.
M.G. Karmarkar, S.K. Shukla, S.P. Mhaskar and S.S. Ramamurthi, CAT/I/88-4.

3. **'Super conducting wiggler for INDUS-I :- a proposal'.**
S.C. Bapna, P.K. Nema, G. Singh S.S. Ramamurthi , CAT/I/88-6

4. 'D.C. Accelerator project report'.
Project Design Group, Accelerator Programme, CAT/I/88-7.

5. 'Design of Transfer Lines'.
D. Angal, G. Singh, S.S. Ramamurthi, CAT/I/88-8.

6. 'Design of Buncher for 15 Mev electron linear accelerator'.
S.A. Pande, P.R. Hannurkar,S.S. Ramamurthi, CAT/I/88-9.

7. 'Conceptual design report for 15-Mev linear electron accelerator'.
H.C. Soni, S.S. Ramamurthi, CAT/I/88-10.

8. 'Design report for a 450MeV synchrotron radiation source (INDUS-I)'.
Project Design Group, Accelerator programme, CAT, CAT/I/88-11.

9. 'Conceptual Design for a 1.4 GeV Synchrotron radiation source (INDUS-II)'.
Project Design Group,Accelerator Programme, CAT, CAT/I/88-12.

10. 'Study of pole shape at entry and exit of dipole magnets for booster synchrotron'.
S. K. Shukla, S.P. Mhaskar, S.S. Ramamurthi, CAT/I/88-13.

11. 'Electron beam transport line magnets for INDUS-I'.
S.K. Shukla, S.P. Mhaskar,S.S. Prabhu, S.S. Ramamurthi ,CAT/I/88-14.

12. 'Conceptual design of beam diagnostic system for INDUS-I'.
Anil Banerji, D. K. Joshi ,S.S. Ramamurthi , CAT/I/88-15.

13. 'Measurement of beam position in the storage ring INDUS-I'.
Anil Banerji , D. K. Joshi ,S.S. Ramamurthi, CAT/I/88-16.

14. 'Study of photon induced gas desorption in INDUS-I'.
K.C. Ratnakala, M.L. Pandiyar R.J. Patel , G. Singh , S. S. Ramamurthi , CAT/I/89-1.

15 .'Design of a Helium liquefier (capacity : 1l/h and 0.5 l/h) and a 4.2 K refrigerator using a three stage Gifford McMahon cycle cryorefrigerator'.
M. Thirumaleshwar, P.K. Kush, CAT/I/89-2.

16. Design of regenerators for a Gifford McMahon cycle cryorefrigerator'.
P.K. Kush, M. Thirumaleshwar, **CAT/I/89-3.**

17. 'Cooling systems for IR-Detectors - a review'.
M. Thirumaleshwar, CAT/I/89-4.

Lectures and Seminars at CAT.

1. Seminar - cum-Discussion on INDUS-II.

A seminar-cum-discussion meeting was organized at CAT on 1st and 2nd Aug. 88 to discuss the specification of the next SRS to be built at CAT ,namely INDUS-II.

Low emittance, high brilliance lattice equivalent to ALS machine at Berkeley was proposed by Accelerator Design team of CAT. The quality of the beam was further discussed by the user-scientists who preferred to have a 2 GeV machine with a larger flux at reasonable emittance. The technological imperatives of the 2 GeV machine will be studied by the design team before the actual design is taken up.

Similar discussions had been organized earlier to discuss INDUS-I machine configuration. However, beam lines and associated instrumentation and proposed experiment with INDUS-I were not discussed then and this was the topic for discussion between user scientists at this meeting. After detailed discussions, experimental areas were identified. Based on these, details of beamline instrumentation can be finalised. INDUS-I will have nine beam lines, of which five will be set up by BARC/CAT, two by universities and the remaining two will be available to other national laboratories, and industries. One of these is expected to be utilized for lithography.

2. Prof. V.K. Tripathi, IIT Delhi gave a lecture on 'Free Electron Laser', on 5th September, 1988.

3. Prof. R. S. Sirohi, from IIT Madras gave a lecture on 'How collimated is your beam' on 18th October, 88.

4. Dr. L.M. Kukreja spoke on 'Medical Laser Programme at CAT' on 17th November, 1988 and on 'Medical Laser activities at P.N. Lebedev Inst. of spectroscopy, USSR' on 18th Nov. 88.