Solid state nuclear track detectors*

The National Seminar on Solid State Nuclear Track Detectors (SSNTDs) held recently is a prelude to the XXI International Conference on SSNTDs to be organized in October 2002 at Delhi, under the auspices of International Nuclear Track Society (INTS).

H. S. Virk (President, NTSI) in his keynote address gave a historical introduction and referred to the early work of R. L. Fleischer, P. B. Price and R. M. Walker at GEC, Schenectady, USA during the sixties. In his invited talk, R. H. Iyer (CSIR Emeritus Scientist at BARC, Trombay) discussed the role of ion track membranes in industry and a project for their mass-scale production in India using heavy ion beams from accelerators. K. K. Dwivedi (Vice Chancellor, Arunachal University, Itanagar) in his invited talk elaborated innovative tracking techniques and studies carried out on channelling of swift heavy ions in crystals.

The three-day symposium was divided into ten sessions, including one poster session. There were forty oral presentations, ten poster sessions and ten invited talks. S. Singh (GNDU, Amritsar) presented results of his group's work on uranium, radium and radon in the environment of Himachal Pradesh. S. Kumar (DRL, Jodhpur) discussed radiation dosimetry concepts and use of SSNTD films in neutron dosimetry. S. K. Chakravarti (REC, Kurukshetra) reviewed the field of micro/ nanotechnology using nuclear track filters as templates and the fabrication of devices. R. Prasad (AMU, Aligarh) highlighted the role of positron annihilation spectroscopy (PAS) in the study of modifications induced by heavy ions in polycarbonates. Rajiv K. Puri (PU, Chandigarh) presented a theoretical paper on multifragmentation in heavy ion nuclear reactions and cluster model. P. C. Kalsi (Radiochemistry Division, BARC) brought into focus gamma irradiation effects on track registration properties of polymer detectors in his invited talk. T. V. Ramachandran (EAD, BARC) reviewed indoor radon/thoron levels in Indian dwellings based on the studies carried out under the Coordinated Radon Project under DAE. It may be mentioned here that for mitigation of radiation hazard, the radon action level has been fixed in the air of dwellings and in drinking water in most of the European countries, but there is no such limit recommended by the Government of India or DAE, as a safeguard for public health. A radon map for India needs to be prepared on priority and the 'hot spots' identified, if any.

A session was devoted to ion tracks technology and its diverse applications. D. Gopalani (DRL, Jodhpur) presented medical applications of nuclear track filters. He demonstrated the use of filters in hospitals for slow drug release in curing skin ailments. Japan and Germany are the only other two countries engaged in this type of research activity. Virk highlighted the rise of radon emanation and its correlation with microseismicity in Kangra valley. R. C. Ramola (Garhwal University, Tehri Campus) presented his results on equilibrium factors for radon and thoron progenies in Garhwal dwellings. V. M. Chaubey (WIHG, Dehradun) discussed the results of his survey carried out in the Doon valley for radon concentration in groundwater. He correlated the radon concentration with uranium mineralization and tectonics of the Doon valley.

C. M. Lilly (Calicut University) gave a presentation on neutron-induced reaction studies in boron and copper using CR-39 detector. V. B. Joshi and R. V. Kolekar (RSSD, BARC) discussed a computer-based image analysis system for measurement of alpha-particle tracks in CR-39 detector. D. S. Srivastava and M. Mujahid (AMU, Aligarh) discussed the results of a study of dielectric loss with frequency in heavy ion irradiated polymers. Measurement of absolute fission yield of short-lived fission products in the fast n-induced fission of thorium by track etch and gamma-ray spectrometry was presented by A. Ramaswami (BARC). Bhajan Singh (Punjabi University, Patiala) presented his work on K-shell Compton cross-section. P. Mukherjee (Kolkata University) analysed the radon data of Palampur station collected by Virk *et al.*, by using a mathematical model to filter noise from the signal, i.e. the influence of meteorological variables.

Almost 50% contributed papers presented at the symposium dealt with radon monitoring in dwellings. H. M. Mahesh (Mangalore University), P. Y. Reddy (Osmania University, Hyderabad), J. Sanappa (Mysore University), V. I. Narasimham (IIT, Kharagpur) and R. S. Kher (Science College, Bilaspur) presented radon monitoring results in dwellings as a part of DAE-sponsored national radon survey project in India.

*A report on the Twelfth National Symposium on Solid State Nuclear Track Detectors organized during 29–31 October 2001 at DAV College, Jallandhar, Punjab under the auspices of Nuclear Track Society of India.

H. S. Virk, Department of Physics, Guru Nanak Dev University, Amritsar 143 005, India (e-mail: virkhs@yahoo.com)

Aerowoman*

The main objective of the seminar was to bring together the Indian women in the field of aerospace and identify their scientific and technical contributions. In this context, the seminar was perhaps the first of its kind held in India. It was also aptly conducted in the 'Women's Empowerment Year – 2001' declared by the Government of India.

After the welcome address by T. S. Prahlad (Director, NAL), Kalyani Vijayan (NAL), provided an introduction. A unique feature of the inaugural function was a felicitation of the septuagenarian Usha Sundaram, the first woman pilot of the country. Usha Sundaram who had co-piloted India's first Prime Minister Pandit Jawaharlal Nehru, reminisced over some of her memorable experiences.

*A report on the seminar on 'Women in Aerospace in India' acronymed 'Aerowoman' held at the National Aerospace Laboratories, NAL, Bangalore, during 13–14 December 2001.

Nearly 225 registered participants from more than 15 different organizations took part in the seminar. Most of the participants were women. The colourful gallery included scientists, students and a few pilots. The technical programme consisted of 6 invited lectures and nearly 55 contributed papers. The latter were presented in two parallel sessions. As 'aerospace' is a broad area, understandably, the invited talks as well as the contributed papers encompassed different aspects of the subject.

Features of NISHANT, a short-range tactical UAV system, were discussed jointly by Malathi Limaye and Jharna Majumdar (Aeronautical Development Establishment (ADE), Bangalore). They emphasized on Data Link and Tracking system. The capability of the NISHANT ground image exploitation system developed at ADE was also presented. G. Rohini Devi provided an overview of the activities on high temperature composites being carried out at DRDL, Hyderabad. She also touched upon the role of functionally graded materials (FGM). Harpreet A. De Singh (Air India, Mumbai) talked about the challenges facing the aviation industry in the light of newer regulatory requirements. She discussed the details of tackling overcrowding of airspace without compromising on air safety, by using special operations like MNPS, RVSM, and ETOPS. Satellite communication enables users to communicate from any two points on the earth. Thus terrestrial voice/data communication service is accessed in the absence of land-based cellular service. Kamalini Martin (ISRO Satellite Centre, Bangalore (ISRO-B)) dealt with various aspects of satellite-based mobile communication. Flight simulation has been accepted as an inevitable tool in aircraft design. Padma Madhurnath (NAL) described the basic concepts of flight simulation and their role in the contemporary aircraft design in India.

As in the case of the invited lectures described above, the contributed papers also included flavours from many different areas of aerospace. To mention a few, the papers were concerned with varied topics such as check-out operations, propellants, space astronomy, aerodynamic perspective of rockets and launching vehicles, visibility in airports, materials in aerospace, system engineering, structural aspects, standards, data handling, software development, aeroengine, INSAT 2E, GSAT-1, Hansa-3, LCA, etc. Seetha (ISRO-B) described the important development areas in space astronomy and also dealt with ASTROSAT – an Indian multi wavelength astronomy satellite. The paper by Chinmayee Madhavan (NAL) described the technical aspects of a fatigue meter which can be used for 'in service load monitoring' and thus quantify the fatigue damage incurred by an aircraft. Meera Kaushal (GTRE, Bangalore) presented the details of a facility, first of its kind in the country, to conduct design validation tests on the cooling performance of turbine vanes at all significant conditions of an aircraft flight mission. The seminar enabled identification of the wide range of contributions from Indian women to the field of aerospace.

Usha Sundaram, the first woman pilot of India.

The panel discussion on the topic 'Contributions from Indian women to aerospace – Present scenario and future' conducted on 14 December 2001 was lively. The panel discussion was chaired and conducted by Air Marshal P. Rajkumar (Programme Director (FT), Aeronautical Development Agency, Bangalore). The panel members were Chanchal Uberoi (IISc), Sundari Pujari (Director (Air), Ministry of Defence, Delhi), Harpreet A. De Singh, T. S. Prahlad and Kalyani Vijayan. A proposal for starting a new division/chapter for 'Aerowoman' under the aegis of the Aeronautical Society of India, was unanimously welcomed by the panel as well as the participants. As part of the panel discussion it was suggested that new, performance-based awards for women may be instituted. These awards should not, however, prevent women from contesting for general awards, along with men. To encourage more women to enter the field of aerospace, it was suggested that attractive scholarships to graduate and postgraduate students in aerospace, may also be instituted.

The website www.nal.res.in and the extension www.nal.res.in/aerowoman.html provide further information about the seminar.

Kalyani Vijayan, Materials Science Division, National Aerospace Laboratories, Bangalore 560 017, India (e-mail: kavi@css.cmmacs.ernet.in).