

Shri Das, in his talk, mentioned that the post-lockdown performance of Indus accelerators, which are operating in round-the-clock mode, has been brought back to its level before the lockdown. Besides the researchers from all over the country, R&D units of pharmaceutical industries are also using the facility for drug characterization. Shri Das also informed about the progress made in the Agricultural Radiation Processing Facility and the developments in the proton linacs, material science, various lasers and their societal as well as scientific applications. He informed that an Incubation Centre has started functioning in RRCAT to take these technologies from lab to land.



On-line streaming of the proceedings of Foundation Day celebrations in Central Complex.

Many eminent personalities, former Directors, former senior colleagues and RRCAT employees joined the celebrations in online mode and through the live streaming at various locations in RRCAT. Prof. VijayRaghavan interacted online with the dignitaries and the audience. A short video highlighting Centre's strengths was also played in the function.

Dr. Anil Rawat, Director, Technology Development and Support Group introduced the Chief Guest to the audience. Shri S.V. Nakhe, Director, Laser Group and Materials Science Group proposed a vote of thanks. Shri Rakesh Kaul, Associate Director, Materials Science Group coordinated various activities in organizing this function.

The function was organized following the COVID-19 related guidelines, including wearing of masks, maintaining social distancing in seating arrangement, etc.

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N.3: National Science Day celebration

National Science Day (NSD) is celebrated in India each year on 28th February to commemorate the discovery of the Raman Effect by Prof. C. V. Raman, who was awarded Nobel Prize in physics in the year 1930 and Bharat Ratna in 1954. Each year RRCAT celebrates the NSD by holding an Open House for the school and college students, teachers, family members and guests of RRCAT staff members, and invitees from the public. However, this year due to the prevailing COVID-19 pandemic situation, RRCAT celebrated NSD in a completely online mode under the theme “Future of Science, Technology and Innovation (STI): Impact on Education, Skills and Work”.



Glimpse of online program abiding the COVID-19 social distancing guidelines.

More than 650 students and teachers of 27 schools and 9 colleges from Indore and from distant as well as nearby cities like Mallapuram (Kerala), Pilani (Rajasthan), Burhanpur, Ujjain, Barwani, Mhow joined the online virtual celebration with immense enthusiasm and vigour. To begin with the celebration, Shri Purushottam Shrivastava, Chairman, Public Outreach Committee and National Science Day (NSD-2021) Organizing Committee welcomed the participants. In his welcome address, delivered in Hindi language, he informed the audience about the theme of this year's NSD and brought awareness to the students about the Science, Technology and Innovation Program 2020 (STIP 2020) and how students can contribute towards the formation of STIP. Shri Debashis Das, Director, RRCAT addressed the participants in Hindi language and informed that the NSD is celebrated to commemorate the path-breaking discovery of Raman Effect. He brought out several inspirational aspects of Prof. Raman's personality and life-style besides his scientific contributions. He gave an overview of Laser and Accelerator activities pursued at RRCAT, and explained several applications. Short movies depicting importance of hygiene and cleanliness were also shown under the “Swachh Bharat Abhiyan”.

The participants of NSD-2021 were given an online tour of various laboratories and scientific activities of RRCAT through video clips of about 90 minutes on Synchrotron Radiation Sources (SRS) Indus-1 and Indus-2, Accelerator Radiation Processing Facility (ARPF), Infra-red Free Electron Laser (IRFEL), Raman effect, Raman Probe, Neel Bhasmi,

Onco-Diagnoscope, Tuberculosiscope, Laser marker, paint removal by CO₂ laser, laser additive manufacturing, artificial cloud formation, superconducting maglev train, water jet cutting, demonstration of glass blowing, etc. and also on the experiments set up to explain the basic principles of physics, technologies and cryogenics.

The students interacted with the expert panel of RRCAT by communicating their questions through chat box as well as live online interaction. The interaction session of about 90 minutes received overwhelming and enthusiastic response from the students. A separate interactive online session was conducted for about 40 students of special schools for hearing and speech impaired (deaf and mute) students, who interacted with the Director and other experts. They tried to address their queries with the help of interpreter-teachers available at the special school. The students participated actively with wholehearted enthusiasm in this interactive session. A special session of more than 120 minutes for the college students has also been conducted in the afternoon in which about 250 students interacted with the expert panel of RRCAT. The NSD-2021 celebration was highly appreciated by the participants, as was evident from a number of feedback messages received from the teachers and the students.



Online program execution team at RRCAT.

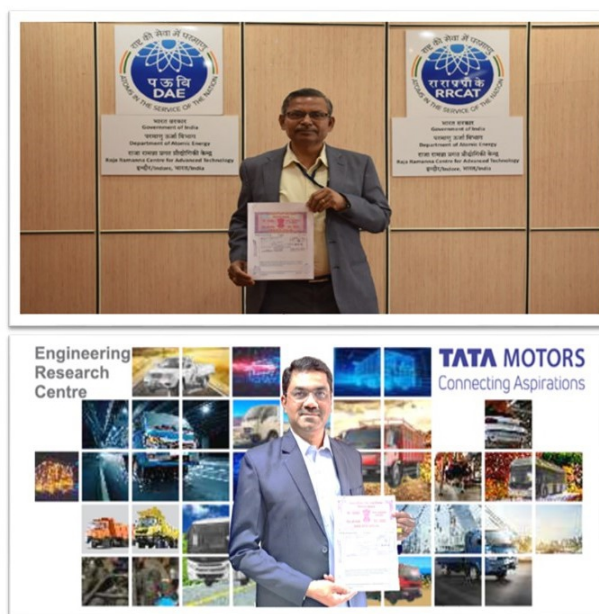
The Webex platform received from Homi Bhabha National Institute (HBNI), Mumbai was used for the online program session with all the students, teachers and invited guests. Each student, teacher and invited guest could join the interactive program from his or her home or office. Students of colleges and schools were in touch with an assigned respective volunteer through telephone. The event was managed, under keen supervision of Shri Debashis Das, Director, RRCAT, by an Organizing Committee with Shri Purushottam Shrivastava as the Chairman of the Apex Committee and Shri Rajesh Arya as the Convener. The committee made elaborate arrangements for the event with the help and cooperation of a large team of experts, volunteers, exhibitors, administrative staff, and security personnel to make the event a grand success.

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N.4: An incubation agreement signed between RRCAT and Tata Motors Ltd.

On April 17, 2021, Incubation Centre, RRCAT and Tata Motors Limited (TML), India's largest commercial vehicle manufacturer, signed an incubation agreement to jointly develop next generation refrigeration technology for vehicles and cold chain transports in the category of chilled, frozen and cryogenic temperature range. This will be widely used for transportation of perishable goods, fruits and vegetables, pharmaceuticals, and most importantly, vaccines. Liquid nitrogen (LN₂) based refrigeration system - SHIVAY (शीतल वाहक यंत्र) will bring benefits to the society, echoing our commitment towards 'आत्मनिर्भर भारत'.

At present, the diesel-powered and chlorofluoro carbon based refrigerated trucks are predominantly used in cold chain for transportation. This joint working will help to develop eco-friendly liquid nitrogen based vehicular level refrigeration system, which will not only reduce the total cost of ownership but also maintain life and freshness of the goods and efficacy of vaccines during transit.



Shri Debashis Das, Director, RRCAT and Shri Aniruddha Kulkarni, Vice President & Head, CV Engineering, Tata Motors Ltd. after signing incubation agreement.

After signing the agreement, Shri Debashis Das, Director, RRCAT said, "The incubation agreement signed with Tata Motors Limited for jointly developing the LN₂ based refrigeration system technologies (SHIVAY) developed by RRCAT for vehicular applications to transport fruits and vegetables (F&V), pharmaceuticals and other similar products, is a significant step towards percolation of DAE technologies in the country under the 'आत्मनिर्भर भारत' mission of Government of India." He expressed the confidence that SHIVAY technologies of RRCAT will find wider use in cold-chain transportation through this initiative of TML.