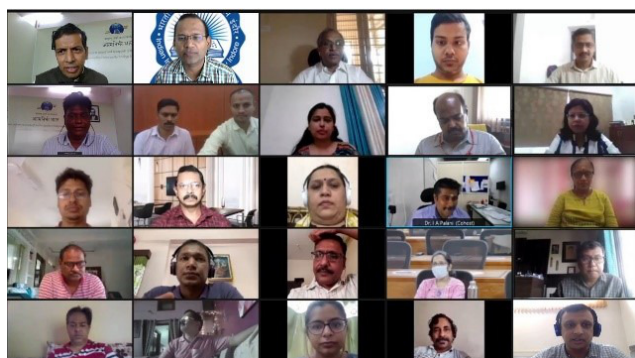


N.1: Online workshop on “Creating Lab-to-Land Ecosystem: Challenges & Opportunities”

Incubation Centre-RRCAT and IIT Indore jointly conducted an online workshop on “Creating Lab-to-Land Ecosystem: Challenges & Opportunities”, on August 14, 2021. The workshop was inaugurated by Dr. S. V. Nakhe, Director, RRCAT and Prof. N. K. Jain, Director (Officiating), IIT Indore. The workshop aimed to bring together researchers, engineers, industry experts, students, and scientist to create awareness about Lab-to-Land Ecosystem: Challenges & Opportunities in Indian context. As present world is being driven by rapidly evolving technologies and intellectual property, there is an increased demand of transformation of R&D from Lab-to-Land, which is basically the research adopted by industry, start-ups, new products, etc. This Lab-to Land transformation is only possible through a sustainable ecosystem, where the challenges are converted to opportunities through R&D. Dr. I. A. Palani, Dr. Ruchi Sharma from IIT Indore and Dr. C. P. Paul from RRCAT organized the workshop.

During the inaugural address, Dr. S. V. Nakhe, Director, RRCAT emphasized on the importance of such workshop to bring holistic change in the technology transfer ecosystem. He encouraged the technology developers and entrepreneurs to join this mission and said, “India needs a smooth adoption of the technologies developed in the laboratories by the industries/ startups to address many burning national problems including unemployment. These efforts are in-line with Atma Nirbhar Bharat initiatives of Government of India and is a way for India to become developed nation.”



Screenshot of online workshop “Creating Lab-to-Land Ecosystem: Challenges & Opportunities”.

Addressing to the participants, IIT Indore officiating director Prof. N. K. Jain said that the world is being driven by rapidly evolving technologies and intellectual property and hence, there is an increased demand of transformation of R&D from Lab-to-Land. “Lab experiments and innovation must be converted into socially relevant products and services, IIT Indore & RRCAT will jointly provide the ecosystem for the benefit of the common man,” he added.

The resource persons included experts and veterans of their field. Prof. N. Ramesh Babu from IIT Madras imparted the importance of industry and institute interaction for technology development, while Prof. Prabuddha Ganguli, CEO, IPR

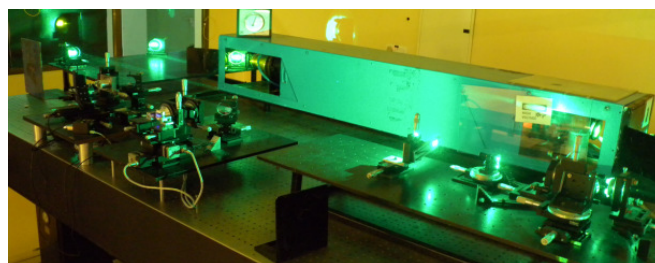
Vision & Adjunct Faculty, IIT Jodhpur shared his wide experience on Transform, Translate and Transfer, “Thoughts to Tangibles”. Prof. Prashant Salwan, IIM Indore explained the business strategies for market driven product ecosystem and Prof. B. V. Phani, IIT Kanpur guided the participants on the challenges in Lab-to-Land ecosystem.

The panel discussion on the topic “Creating Lab-to-Land Ecosystem” brought out widespread awareness about the challenges of the journey from Lab-to-Land. More than 400 participants from across the country registered for this online workshop.

*Reported by:
C. P. Paul (incubation@rrcat.gov.in)*

N.2: Incubation Centre-RRCAT extends utilization of FBG inscription facility to Indian industries

To create opportunities for incubation of DAE technologies and to promote technology transfer, leading to a developed product/ viable commercial product, Incubation Centre-RRCAT (IC-RRCAT) is taking various initiatives. Recently, IC-RRCAT started the incubation services for various application development encouraging industries and academia to take the technology to broader public domain. The utilization of the fiber Bragg grating (FBG) inscription facility is one among the various services being offered by IC-RRCAT.



Fiber Bragg grating inscription facility developed at RRCAT.

For the above, an indigenous copper vapor laser system-based FBG inscription facility developed at Fiber Sensor and Optical Spectroscopy Section (FSOSS), RRCAT is being used. As shown in figure, this system comprises of indigenously developed copper vapor laser, its second harmonic and FBG inscription set-up. Such a facility is developed for the first time in India and has been operating successfully since past 4-5 years. Over the years, FBG fabricated on this facility have been successfully tested for various applications, like -temperature sensing, strain sensing, etc. In recent times, Indian industries are importing these FBGs to cater many novel applications.

Hence, Indian industrial partners, MSME and start-ups were invited by IC-RRCAT to come up with well-defined and commercially viable proposals for developing FBG sensors and systems by utilizing the FBG inscription facility at RRCAT, Indore. Many industries showed confidence on this indigenous technology and expressed their interest in utilizing the facility for various sensing applications including

temperature, vibration, strain, chemical, etc. The unique salient proportions of fabricating the FBG sensors using RRCAT facility are: specialized custom-built sensors, independence from foreign source, and cost-effective solution.

During last few months, the demand for 100 number of customized FBGs has been received from M/s Lab to Market Innovations Private Limited (L2M), Bengaluru for a project pertaining to advanced safety systems of Indian railways. The required specifications of the FBGs are grating length of 5 mm, reflectivity of more than 80%, FWHM between 0.4 to 0.6 nm, Bragg wavelengths of 1534 nm, 1537 nm, 1540 nm, 1543 nm, 1546 nm, 1549 nm, 1554 nm and 1559 nm. These sensors are being used by L2M for appropriate wheel impact load detection (WILD) system, which are attached to the railway track to measure strain caused by the movement of wheels over the sensor zone. The information gathered from these sensors are being used to build systems for estimated load on the axle, axle count and quality of wheel.

Utilization of RRCAT fabricated FBG is an ongoing process and the demands received from ISRO and IITs/NITs are under processing for sensor development and validation.

Reported by:
C. P. Paul (incubation@rrcat.gov.in)

N.3: Design and development of 650 MHz, 40 kW solid state RF amplifier and its shipment to Fermilab, USA

As a part of its R&D phase deliverables to Fermilab, USA (FNAL) for use in PIP II (Proton Improvement Plan II), design and development of 40 kW solid state RF amplifier at 650 MHz was taken up at RRCAT under the framework of Indian Institution Fermilab collaboration. Last year, 36 kW/650 MHz, solid state RF amplifier developed at RRCAT was sent to FNAL and after its successful installation, testing and joint acceptance, this new development was carried out with modified design requirements from Fermilab. The 40 kW RF amplifier is modular in design using 64 way combining/dividing architecture using 2 kW RF power amplifying modules as basic RF power units, having four RF amplifier slices of 500 W each on a common cold plate. Various RF components developed and used in this 40 kW amplifier includes; 34 RF power modules, 66 RF directional sensors, 2 sets of 64-port radial dividers and combiners, 2 phase shifters, one two-port high power combiner, 2 high power line sections, and 3 high power directional couplers. All of these RF components were developed indigenously and most of them were mass produced in local industry after their suitable technology transfer as per DAE norms. After rigorous testing of 40 kW RF amplifier, for different RF parameters such as RF power, gain, wall-plug efficiency, linearity, bandwidth, group-delay, pulse characteristics, spectral purity, etc., it was shipped to FNAL in Dec. 2021.



Photographs of the 40 kW, 650 MHz solid state RF amplifier (left) and snapshot of the measured RF power during rugged testing at RRCAT with 50 Ohms RF load (right).

Reported by:
Akhilesh Jain (ajain@rrcat.gov.in)

N.4: Trade Apprenticeship Scheme at RRCAT

RRCAT has initiated a Trade Apprenticeship Scheme at RRCAT (TASAR) under National Apprenticeship Promotion Scheme (NAPS). This scheme is successfully training ITI passed students by providing them access to the modern engineering infrastructure under the guidance of experienced and knowledgeable engineers and technicians. This scheme is helping the organization by providing semi-skilled technical manpower.

Encouraged by success of the program in technical field, apprenticeship in non-technical trade has also been introduced this year with first batch consisting of nine apprentices in stenographer and secretarial assistant trade. Their one year apprenticeship commenced on 1st September 2021 at IRPSU, Administration and Accounts Division.



Apprentice being trained at Accounts Division.

Fourth batch of apprentices in technical trades was also started from 1st October 2021. Although the selection process of the apprentices was completed in March 2020, the training could not be started on scheduled time due to pandemic.