

## REPORT ON INDO-CZECH WORKSHOP

A two days Indo-Czech workshop on “Issues Related to IV Generation Energy Systems” was conducted by the Center for Advance Research under Department of Physics, Rajiv Gandhi University from 21<sup>st</sup> to 22<sup>nd</sup> of October, 2019. On the occasion “The Center for Advance Research”, inside the Department of Physics was inaugurated by Prof. Saket Kushwaha, the Hon’ble Vice-Chancellor of RGU. The workshop started with the inaugural ceremony attended by dignitaries from the University namely, Prof. Saket Kushwaha (VC), Prof. Tomo Riba (Registrar), Dean of faculties, Head of Departments, faculties from NERIST. Prof. J. Adam and Dr. Karel Katovsky from Brno University of Technology (Czech Republic), Prof. Vinod K. Verma, Visiting Professor, Department of Physics, RGU and Dr. Nagendra S. Raghaw (College of Global Excellence, University of Rajasthan) also attended the ceremony as resource persons. The inaugural ceremony started with felicitation of persons on the dais by Dr. Upamanyu Das and Dr. H. S. Singh followed by the lamp lightening ceremony. Prof. P. K. Kalita, Dean, Faculty of Basic Sciences delivered the welcome address followed by a brief introduction to the workshop by Prof. V. K. Verma.

The first lecture in the technical session was delivered by Dr. Karel Katovsky on advanced nuclear systems. He talked about the incidents which have demanded for having more safe nuclear plants and also discussed about the various generations of them. He emphasized on the IV generation nuclear reactors, their properties, motivation and its various kinds like VHTR, PBMR, SCWR, GFR, LFR, SVBR-100, SFR, and MSR. Besides them he also discussed about the other on-going programs in various countries including India and described the US and India’s point of view regarding the IV generation reactors. He also gave a glimpse of the Generation V fusion nuclear reactors and his book co-authored with Prof. V. K. Verma on spent nuclear fuel and ADSS.

The second lecture was on “” delivered by Prof. V. K. Verma. In his talk he discussed about the different types of radiation damage and their resultant consequences. He also discussed about the developmental studies of various materials like SiC, AlN, Zr<sub>3</sub>Si<sub>2</sub> etc. He briefly discussed about the graphite block which is a model for the reactor core and also gave a glimpse of the QUINTA and Phasotron experimental setup.

The third lecture was by Prof. J. Adam. He gave an introductory idea about PHASOTRON experimental setup and talked briefly about the quasi-infinite depleted uranium target (BURAN) with replacement central zone

The fourth and last lecture for the day was delivered by Dr. Nagendra S. Raghaw. He discussed the results of a Monte Carlo simulation study on damage to reactors due to spallation neutrons and possibility of reducing it using Silicon carbide.

The technical session, on the second day started with Dr. Karel Katovsky talking about the project, submitted by RGU (India) and Brno University of Technology (Czech Republic) to DST and Czech Republic under the bilateral project program. In his talk he discussed about the motivation for submitting the project, the expertise of investigators, the objectives and the expected outcomes of the project. He also briefed about the available accelerator facility in their University and in the neighboring places that they can use for the experiments. He also discussed about developing a Monte-Carlo code as one of the objectives of the project.

The second lecture was delivered by Dr. H. S. Singh, Assistant Professor, Department of Physics, RGU on the topic of Solar system focusing on the Sun and various phenomenons occurred inside it. In his talk he showed data about the world energy's demand and its consumption. He talked about the properties and structure of the Sun and over that explained about the various phenomenons in the Sun like solar prominence, coronal mass ejection, solar flares, solar wind etc. He briefly discussed about the chromospheres and the spicules in them along with the Sun spot and magnetic field. He showed the various energy transport regions in the Sun like the convective and the radiative zones. He also talked about how the energy-mass relation came from Special Theory of Relativity leading to the idea of nuclear fusion and also explained the fusion reaction, taking place in the core of the Sun. Lastly, he discussed about the anticipated fate of the Sun i.e., of becoming a white dwarf.

The final lecture was given by Prof. J. Adam related to one of his experiments on the effects of proton and neutron field on the surface of graphite and lead target under 660 MeV proton irradiation. He talked about the dimension of the graphite target and lead target used and the parameters of the proton beam used. He explained the spatial distribution along the graphite and lead target of experimental rate of fission and Uranium and Neptunium products.





Inauguration of Centre for Advance Research