

### N.9: Talk on breast cancer awareness

Awareness is the key to timely detect and treat cancer. In order to spread awareness about breast cancer amongst RRCAT community, RRCAT Women's Welfare Committee (WWC) organized a talk in co-ordination with Medical Centre on breast cancer awareness on 14<sup>th</sup> Nov 2018. The speaker was Dr. S. P. Shrivastava, HoD, Oncology Dept., Shalby Hospital, Indore. The program was attended by over 200 people, which included employees, spouses, colony residents, CISF family members and students.



*Ms. Sujata Joshi welcoming Dr. S.P. Shrivastava (top) and the attendees of the lecture (bottom).*

The programme was conducted by Ms. Swati Chaudhary. Dr. Bhavani gave a brief introduction of the speaker to the audience. Ms. Sujata Joshi, Chairperson, WWC welcomed the guest with a plant. This was followed by the talk by Dr. S. P. Shrivastava on the subject. Initially, he made the audience aware about different types of prevalent cancers and emphasized that breast cancer was the second most prevalent form of cancer. He pointed out the difference between malignant and benign tumours. He also mentioned about the risk factors and probable causes of cancer amongst females. He emphasized on the need of periodic self examination and also regular clinical examination after age of 45 for early detection of breast cancer. He informed that HPV vaccines can be given to females of age group 9 to 16 years for prevention of cervix cancer. Dr. Shrivastava discussed treatment options available for various stages of cancer. His easy to understand slides were appreciated by everyone present. The vote of thanks was proposed by Ms. Shradha Tiwari.

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### N.10: RRCAT Seminars during July-December 2018

**Understanding the high temperature thermoelectric properties of some oxide materials :** *Dr Sudhir Kumar Pandey, Associate Professor, School of Engineering, IIT, Mandi, July 06, 2018.*

In the past few decades, need of energy resources has highly been increased. Most of the non-renewable natural resources (coal, petroleum and natural gases) have limited stock may be sufficient for next fifty years. Therefore, the need of alternate resources of energy are in high demand. Thermoelectric materials are one of the best sources of clean energy, which is efficient in conversion of heat energy into electrical energy. Due to this, a lot of efforts are being put to search new thermoelectric electric materials. Using DFT based tools many researchers are predicting new thermoelectric materials. However, due to lack of proper bench marking in high temperature region, most of the predicted materials are very difficult to realize experimentally. In this talk, the applicability of DFT+U method in studying the high temperature thermoelectric behaviour of some oxide materials viz.  $ZnV_2O_4$ ,  $LaCoO_3$  and  $La_{0.75}Ba_{0.25}CoO_3$  compounds were shown. The ground state electronic structure is found to reasonably explain the high temperature thermoelectric behaviour of these compounds if temperature dependent band gap and scattering time are properly considered.



**Soft x-ray reflectivity- a tool for structural and compositional analysis in thin films:** *Dr. M. H. Modi, Head, Soft x-ray Applications Lab, October 10, 2018.*

Determination of optical constants and refractive index in soft x-ray/vacuum ultra violet region is very useful as absorption edges of most of the elements lie in this photon energy region, enabling one to perform spectroscopic analysis of complex samples using refractive index measurements. Angle dependent reflectivity technique for getting information of optical constants has an advantage over transmission measurements as both  $\delta$  and  $\beta$  can be deduced simultaneously and measurements are carried out on bulk thin film samples. In the soft x-ray region, the contrast in optical constants is sufficiently high for thin films of low atomic number elements. Near the absorption edges the energy-dependent atomic scattering factor gives a resonant behaviour and offers an opportunity to enhance the

