



**Web Based Course on**  
**Radiation Detectors :**  
**A How to Approach**



**5<sup>th</sup> - 9<sup>th</sup> April 2021**

*Organized by*  
*Department of Physics, Central University of Jharkhand,*  
*Cheri-Manatu, Kamre, Kanke, Ranchi, Jharkhand-835222*  
*In Collaboration with*  
*UGC-DAE Consortium for Scientific Research, Kolkata Centre*  
*Sector III, LB-8 Bidhan Nagar, Kolkata 700106*

**5<sup>th</sup> April 2021**

- 15:00 – 15:25      Inauguration  
Welcome Address by Prof. S. Medhekar, Member, Organizing Committee, CUJ, Ranchi  
Address by Dr. Dharmendra Singh, Convenor, Organizing Committee, CUJ, Ranchi  
Address by Dr. Sandeep S. Ghugre, Member, Organizing Committee, UGC DAE CSR, KC, Kolkata  
Address by Dr. Rajarshi Raut, Convenor, Organizing Committee, UGC DAE CSR, KC, Kolkata  
Address by Prof. R. K. Dey, Hon'ble Vice Chancellor (Acting) CUJ  
Address by Dr. Abhijit Saha, Centre Director, UGC DAE CSR Kolkata Centre.  
Vote of Thanks by Dr. Dharmendra Singh, Convenor, Organizing Committee, CUJ, Ranchi
- 15:30 – 16:10      Lecture I – Dr. R. Raut, UGC DAE CSR Kolkata Centre
- 16:20 - 17:00      Lecture I – Dr. S. S. Ghugre, UGC DAE CSR Kolkata Centre

**6<sup>th</sup> – 9<sup>th</sup> April 2021**

- 15:00 – 15:55      Lecture by Dr. R. Raut, UGC DAE CSR Kolkata Centre
- 16:05 : 17:00      Lecture by Dr. S. S. Ghugre, UGC DAE CSR Kolkata Centre

**Topics**

**Phenomena** - decay, decay schemes, calculation of activity; nuclear reactions, CN reactions, calculation of yield.

**Interaction** - interaction of radiation with matter

**Detection** - basic principle of radiation detectors, solid state detectors, scintillation detectors, HPGe based detectors for gamma-ray spectroscopy, detector properties (energy resolution, efficiency), spectrum.

**Processing** - pulse characteristics, basic pulse processing for extraction of energy and timing info

**Data** - digitization and data acquisition, histogram data, construction of spectrum, basic analysis (calibration, area etc.)

**Uncertainties** and their propagation. Systematic and statistical uncertainties in spectroscopy data. The correct way of representing uncertainties.

**Statistical distributions**- Gaussian distribution and its relevance/significance in analyzing spectroscopy data. different parameters of the Gaussian distribution and the associated facet of the corresponding detection.

**Data fitting** and its applications in the analysis of spectroscopy data. Peak fitting, fitting for determining calibration parameters.

**Simulation** of a detector pulse and application of pulse processing algorithms, such as shaping and leading edge discrimination.

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