"I WANNA KNOW RESONANCE"
A One-day Discussion Meeting On Resonance
Venue : Institute Lecture Hall
Date : 31. 07. 2003

ABSTRACTS

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Speaker : A. Khare

Title : Resonances in Physics: a Brief Survey

A pedagogical review of the phenomenon of Resonance will be given. In particular, I shall illustrate it with simple examples in classical and quantum mechanics and also point out some of its applications in other areas including Nuclear and Particle Physics, Atomic and Molecular Physics, and even chemistry and mathematics.

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Speaker : S. G. Mishra

Title: Prelude to Quantum Mirage

A brief sketch of developments which lead to our understanding of behavior of magnetic impurity in a metal will be presented. Though the basic issues were clarified 20 years ago, there is a revival of interest in this problem because of observation of intriguing phenomenon in STM corral 2 years ago.

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Spaeker : S. Panda

Title : Comparison of resonant tunneling
in parabolic and diffusion modified quantum wells

Double barrier resonant tunneling diode using annealing induced diffusion modified quantum well is proposed as a viable alternative to that using parabolic quantum well which requires complex techniques to fabricate it. The transmission coefficients are calculated using the hybrid incremental Airy function plane wave approach. The room temperature current-voltage characteristics have been calculated using transmission coefficients. The current-voltage characteristics are found to be similar in both diodes.

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Speaker : T. Som

Title: Resonant Nuclear Reaction Analysis: A Tool for Materials Study

Nuclear reaction analysis (NRA) is an old method for materials analysis. In a typical NRA experiment, above certain energy of the incident beam, which depends on the incident particle and the target, the scattered particles appear in the detected spectrum. This technique is very much isotope sensitive and due to the use of an absorber foil (to filter out unwanted particles to reach the detector) before the detector, depth resolution is generally poor. The depth resolution can be improved if resonance exists. In this talk, we shall discuss about the efficacy of the resonant nuclear reaction analysis for detection of hydrogen and oxygen, which are otherwise difficult, when present with high-Z elements in a target.

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Speaker : L. N. Satpathy

Title: Nuclear Molecular Resonances

After giving an introduction to the phenomena of resonances, the general problems associated with their identification in potential scattering theory will be discussed. Two elegant methods, termed as Imaginary Test Potential and Imaginary Phase Shift Methods, developed in this laboratory to circumvent these problems, will be presented with applications to different potentials.

The frontier area of nuclear molecular resonances observed in heavy-ion collisions will be reviewed. The present status of our understanding of this complex phenomenon will be presented.

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Speaker : L. P. Singh

Title : Resonances in Particle Physics

Particle resonances will be enumerated followed by a discussion on general methods adopted for detection of these resonances. Next, an understanding of these resonances on the basis of S-matrix theory and quark model will be discussed.

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