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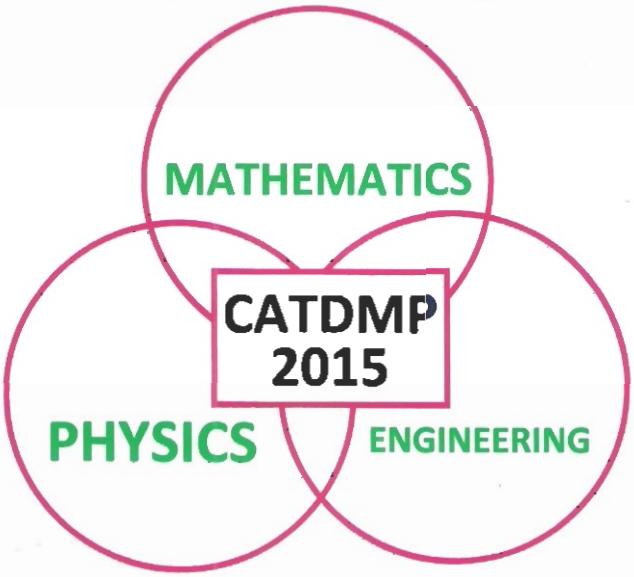
CONFERENCE ON ADVANCE TECHNIQUES & DEVICES IN MATHEMATICS & PHYSICAL SCIENCES

23rd - 25th JANUARY, 2015



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CONFERENCE ON ADVANCE TECHNIQUES & DEVICES IN MATHEMATICS & PHYSICAL SCIENCES (AN INTERNATIONAL MEET)

CATDMP- 2015

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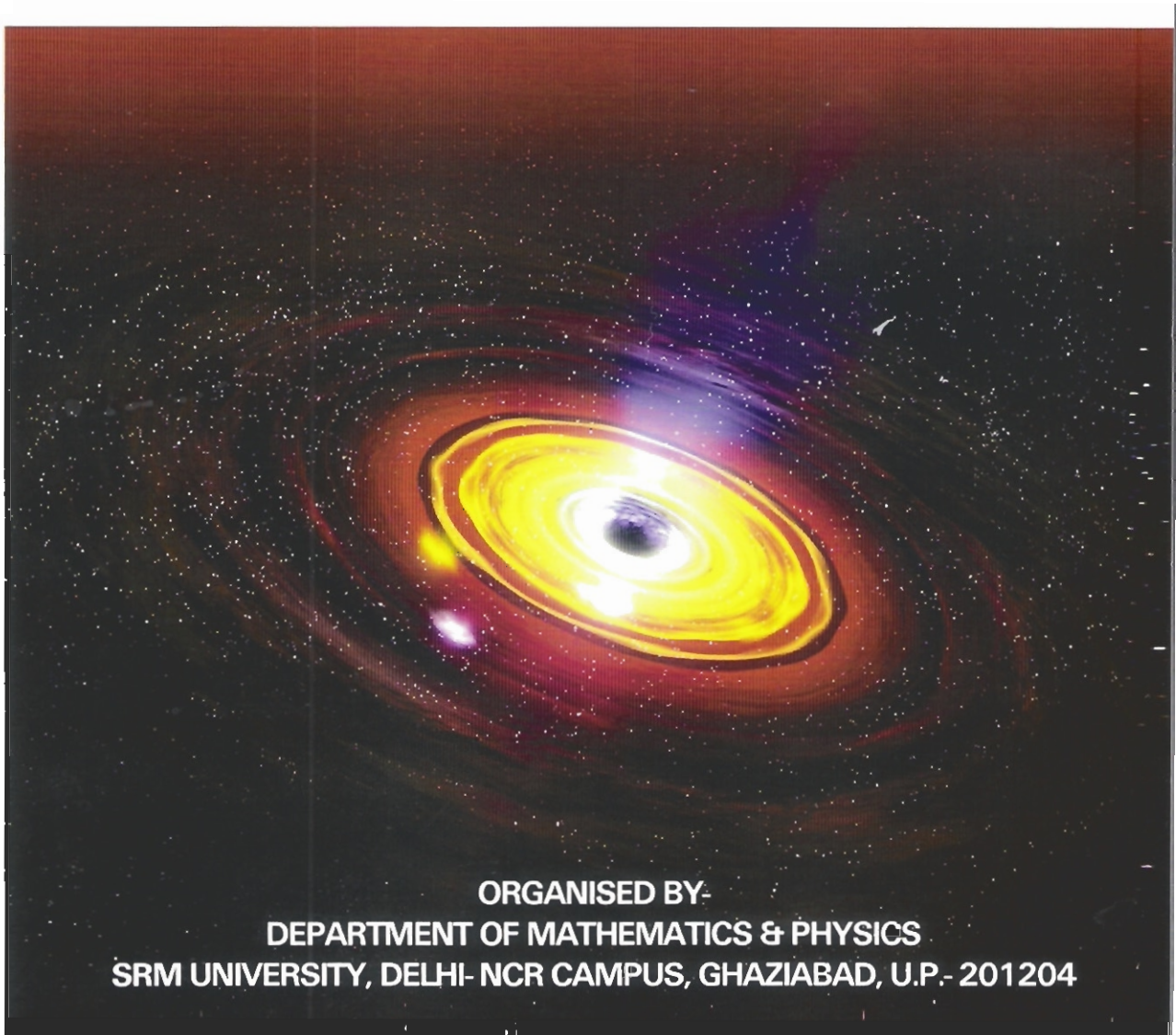

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Synthesis and Surface Passivation of Magnetite Nanoparticles

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In the present work, we report synthesis of Iron oxide nanocrystals which is aquous dispersible. Tannic acid, a naturally occurring molecule was used as reducing as well as capping agent. X- ray diffraction patterns indicate that the magnetic nanoparticles were of pure Fe3O4 nanocrystals (JCPDS 070322) with a crystalline size ~5 nm. At different pH value we have seen the different XRD patterns due to the formation of Fe Nanoparticles other than Fe3O4 crystals.

Tannic acid at its natural acidic pH is known to be a weak reducing agent that can only grow seeds into nanoparticles at room temperature. We studied the behavior of tannic acid at different value of pH by using the UV- visible spectroscopy, shift occurs in UV-visible spectrum as we change the value of the pH. We have also studied the photoluminescence spectra of Tannic acid and monitor the variation with change the pH value. For surface pssivation we use the dextrin, thiourea, salicylic acid, polyvinyl alcohol, sodium dodecyl sulfate (SDS), cetyltrimethyl-ammonium bromide etc.

Keywords: X- ray diffraction, photoluminescence spectra, pH value.

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The Mathematical and Physical science concepts involved in the Design of Advance Vibration & Shock isolation systems focusing Automobile and Aerospace Applications.

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This is an Industry-Academia oriented presentation highlighting the field concept of Higher Mathematics and Physics involved in the Engineering Design of Vibration & Shock isolation systems for varied industrial applications from power plant machineries to high resolution quantum metrology experiments. The Vibration isolation results are validated by actual measurement after installation. The actual results are found to be well within +/- 5% of the calculated result. The Glimpses of applications in other areas including Earthquake protection of buildings will be clustered in the concluding slide.

Keywords: Vibration and Shock definition, Spring –Mass model, Optimization, Eigen-frequency, Spring Damper System, Air Springs and Isolation efficiency.