



Report on Faculty Development Programme

The Faculty Development Programme facilitates up - gradation of knowledge, skill and intends to provide opportunities to learn latest trends, techniques in teaching learning process along with enhance the efficiency of the delivery of the matter. Seven days online FDP was attended by faculty of Physics, Centre Of Excellence Govt. College Sanjauli, Shimla, Dr. Kirti Singha & Dr. Monika Chandel on “Quantum Physics Simulations Using Gnumeric worksheets” from August,1, 2021 to August 7, 2021 organized by Department of Physics and Astronomical Sciences, Central University of Himachal Pradesh in collaboration with Indian Association of Physics Teachers – Regional Council 3. The inaugural session started with chanting of Mantras by the Co-ordinator of the Programme Dr.O.S.K.S. Sastri, CUHP, followed by key note speaker address by Vice - Chancellor of Central University of Himachal Pradesh.

Department of Physics and Astronomical Sciences
Central University of Himachal Pradesh (CUHP) and
Indian Association of Physics Teachers–Regional Council (IAPT-RC3)
Jointly Organise an
Online Faculty Development Programme (FDP) from 1st to 7th August, 2021
on the topic
Quantum Physics Simulations Using Gnumeric Worksheets

Day-wise Program Schedule

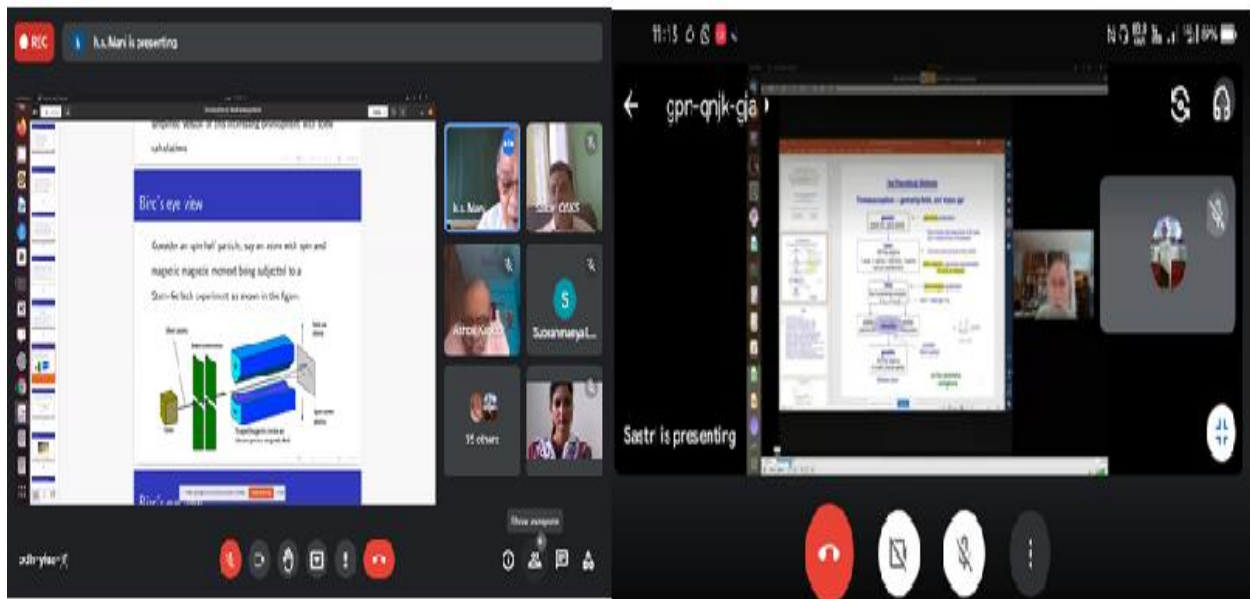
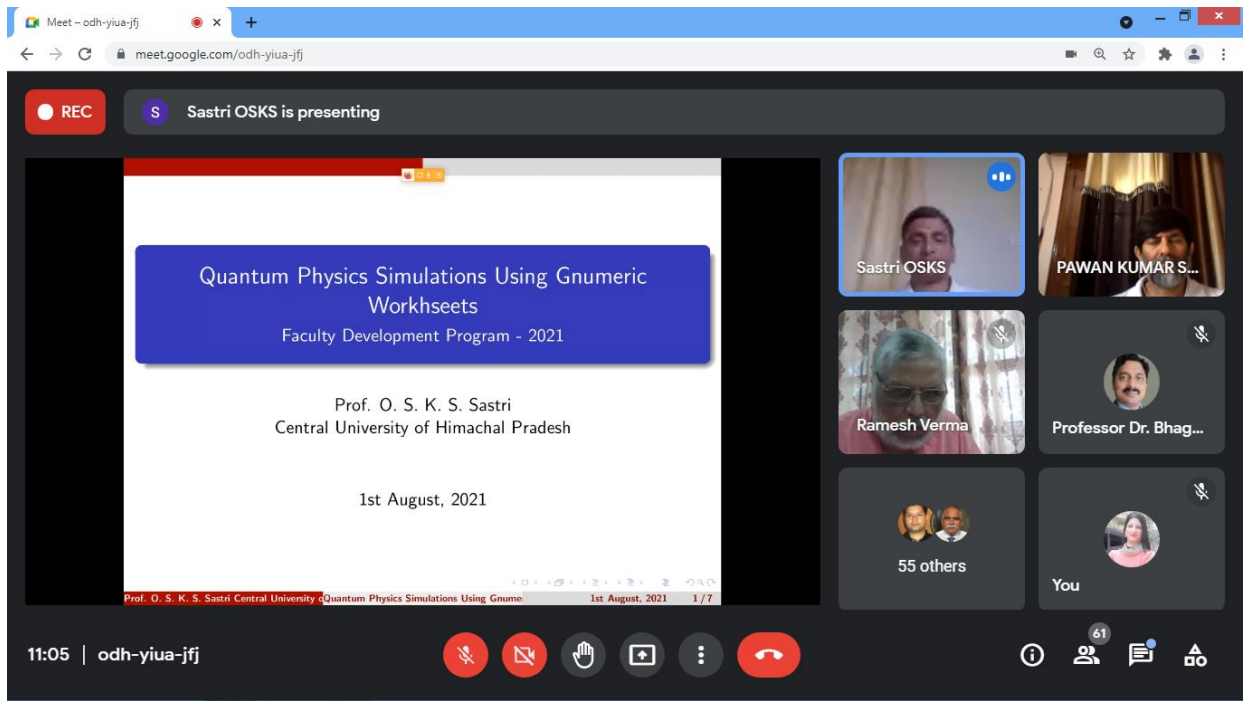
Date	Time	Title	Resource Person
1-08-21	11:00 am	Benedictory Address	Prof. Sat Prakash Bansal Honorable Vice-Chancellor Central University of Himachal Pradesh, Dharamsala
	11:30 am	Inaugural Address: An Overview of Quantum Physics	Prof. R.C. Verma , Professor Emeritus
	3:00 pm	An Introduction to Simulation Methodology	Prof. O.S.K.S. Sastri , CUHP
	4:00 pm	Particle in 1D Box using Central Divided Difference (CDD)	Sapna Verma, RKMV, HPU Shimla
2-08-21	11:00 am	Evolution of Quantum Mechanics and its different formulations.	Prof. P.K. Ahluwalia , HPU
	3:00 pm	Finite Square Well: Analytical solutions using Bisection	Prof. O.S.K.S. Sastri , CUHP
	4:00 pm	Introduction to Numerov Matrix Method (NMM) for solving Harmonic Oscillator	Dr. Sunil Bansal , Punjab University, Chandigarh
3-08-21	11:00 am	An introduction to weak measurement and entanglement.	Prof. H.S. Mani , Institute of Mathematical Sciences, Chennai
	3:00 pm	Introduction to Matrix Methods with Sine Basis (MMS)	Prof. O.S.K.S. Sastri , CUHP
	4:00 pm	Harmonic Oscillator using MMS	Dr. Pawan Kumar Sharma , GC, HPU, Solan
4-08-21	11:00 am	Re-arranging information - Isospectral Approach	Prof. C. Nagaraja Kumar , Punjab University
	3:00 pm	Coulomb potential using CDD and NMM	Dr. Vikram, Goswami Ganesh Dutta Sanatan Dharma College , Chandigarh
	4:00 pm	Morse potential using NMM and MMS	Prof. O.S.K.S. Sastri , CUHP
5-08-21	11:00 am	Particle in a Box: A Basic Paradigm in Quantum Mechanics	Prof. N. Balakrishnan , IIT Madras, Chennai
	3:00 pm	Modeling n and p Single Particle Energies using Woods-Saxon potential	Dr. K. Vijay Sai , Sri Sathya Sai Institute of Higher Learning
	4:00 pm	Woods-Saxon potential: Implementation using NMM	Prof. O.S.K.S. Sastri , CUHP
6-08-21	11:00 am	Classical Approach to Quantum Theory	Prof. Muralidhar (retd) , National Defence Academy, Pune
		Project Work	
7-08-21	11:00 am	An Introduction to Quantum Impedance Model	Dr. Peter Cameron , Brookhaven Laboratory (Retd), USA

Registration link: <https://forms.gle/tPjU99AwdVm8Z8fa9>

Dr. Pawan Kumar Sharma
(Organising Secretary)
Executive Council Member(IAPT-RC3)

Prof. O.S.K.S.Sastri
(Convener)
Vice-President(IAPT-RC3)

This FDP provided us an academic platform to know about the Simulations in Quantum mechanics, therefore is an alternative way to process equations through programming and codes. The whole week was completely occupied in solving and executing the problems given through Gnumeric spread sheets.



REC sunil bansal is presenting

Introduction to Numerov Matrix Method (NMM)

Dr. Sunil Bansal
Panjab University, Chandigarh

Online FDP on "Quantum Physics Simulations using gnumeric worksheet"
1-7 August, 2021

Organized by
Department of Physics and Astronomical Sciences, CUHP
and IAPT-RC3

sunil bansal, Sastri OSKS, Subrahmanya L..., h.s. Mani, 29 others, You

Vikram Sagar is presenting

Application of Central Divided Difference (CDD) and Numerov Matrix Method For Coulomb Potential

Dr. Vikram Sagar
Department of Physics
Government College of Education, Sector-12, Chandigarh

Vikram Sagar, PIJWAN KIMAZ SH., Aali khachi, 77 others, You

Dr. K Vijay Sai, Associate Professor, Physics, SSSIL is presenting

level energies.
In case of proton, Coulomb potential also needs to be considered and is given by

$$V(r) = \begin{cases} \frac{14.4}{r} & \text{for } r \geq R \\ \frac{14.4}{R} \left[1 - \frac{r}{R} \right] & \text{for } r \leq R \end{cases} \quad (1)$$

This potential is to be replaced in 3dV units. SO, it is multiplied and divided by electron rest mass energy, $m_0 c^2 = 0.511 \text{ MeV}$ to obtain

$$V(r) = \begin{cases} \frac{27.6}{r} & \text{for } r \geq R \\ \frac{27.6}{R} \left[1 - \frac{r}{R} \right] & \text{for } r \leq R \end{cases} \quad (2)$$

The radial TISE for central potentials is given by

$$\frac{d^2 u(r)}{dr^2} + 2\mu \left(E - V(r) - \frac{l(l+1)\hbar^2}{2\mu r^2} \right) u(r) = 0 \quad (3)$$

Dr. K Vijay Sai, Associate Professor, Physics, SSSIL is presenting

Online Faculty Development Programme (FDP) from 1st to 7th August, 2021

Quantum Physics Simulations Using Gnumeric Worksheets

Two-Dimensional potential
by
Dr. K. Vijay Sai,
Associate Professor & RSO,
Sri Balaya Sai Institute of Higher Learning (SSSIL), AP

Organized by
Department of Physics and Astronomical Sciences, Central University of Himachal Pradesh (CUHP)
&
Indian Association of Physics Teachers-Regional Council (IAPT-RC3)

Sastri OSKS, Subrahmanya Hegde, Dr. K Vijay Sai, Hemant Kumar, PIJWAN KIMAZ SH., Sapana sharma, 11 others, You, 18 others, You

The success of the FDP was that we were given a project to solve atleast one equation through the simulations and everyone completed the assignment for the closing day. The Programme was well informative rather empirical from physics point of view and was beautifully executed to put in together theory and Gnumeric spread sheets.

Compiled & submitted by: 1. Dr. Kirti Singha
2. Dr. Monika Chandel