

Curriculum Vitae: Chirag Verma

CONTACT DETAILS

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EDUCATION

Indian Institute of Technology, Roorkee, India
Master of Science (M.Sc.) in Physics (expected) 2023
CGPA (Current): 8.214/10
Equivalent Percentage: 87.14%

Kirori Mal College, University of Delhi, India
Bachelor of Science (B.Sc.) with Honours in Physics 2021
CGPA: 9.283/10
Equivalent Percentage: 88.19%

Salwan Public School, Gurgaon, India
(CBSE) Class XII - 94.2% 2018
(CBSE) Class X - CGPA 10/10 2016

PROJECTS

Strong Coupling in Nanoplasmonic Structures Aug 2022-Present
Indian Institute of Technology, Roorkee, India
Supervisor: Dr. Sachin Kumar Srivastava

- Experimentally studying strong coupling in nanoplasmonic structures by employing the Kretschmann configuration for surface plasmons excitations.
- Skills: Spectroscopy techniques, Electron-beam physical vapor deposition, COM-SOL Finite Element Method (FEM) simulations

Interaction of Silica nanoparticles with lipid monolayers Aug 2022-Present
Indian Institute of Technology, Roorkee, India
Supervisor: Dr. Ravindra Pandey

- Employing the nonlinear spectroscopy technique of Vibrational Sum Frequency Generation (VSFG) to study how silica nanoparticles of different sizes, capped with various ligands, interact with lipid monolayers.
- Skills: Non-linear spectroscopy techniques, wet-lab methods

BiFeO₃ Thin Film Synthesis July 2022
Indian Institute of Technology, Gandhinagar, India
Supervisor: Dr. Rupak Banerjee

- Deposited hydrophobic BFO nanoparticles on a hydrofluoric acid (HF) etched silicon substrate using the Langmuir-Blodgett deposition technique.
- Analysed the resultant film using Brewster Angle Microscopy, X-ray diffraction, X-ray reflectivity, and Field Emission Scanning Electron Microscopy.
- [LINK](#)

Stellar Flares June-July 2022
Indian Institute of Technology, Bombay, India

- Analyzed Chandrayan-2 orbiter's XSM data to study the properties of solar flares. Created a python pipeline for the same.
- [LINK](#)

Neutrino interaction studies July 2021
Institute of Nuclear Physics Polish Academy of Sciences (IFJ PAN), Poland
Supervisor: Dr. Marcela Batkiewicz-Kwaśniak

- Studied $CC1\pi^+$ and $CC\pi^0$ interactions using a precompiled Monte Carlo dataset. Used ROOT and C++ to create the reconstructed plots.
- [LINK](#)

SWAN Antenna Design Challenge June 2020 - September 2020
Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune, India
Mentor: Prof. T.R. Seshadri

- Designed a dual-polarization antenna element suitable for observations at low radio frequencies for phase 2 of the SWAN initiative.
- Used WIPL-D and NEC4 to simulate radiation patterns.
- [LINK](#)

KdV equation for dust-ion-electron plasma June 2020 - July 2020

- Analytical investigation of acoustic waves in a weakly relativistic degenerate dust-ion-electron plasma.
- Solitary waves were also studied by deriving the Korteweg-De Vries (KdV) equation using relevant perturbation expansions. Used MATLAB to simulate the appropriate plots.
- [LINK](#)

SKILLS

Languages: C, C++, Python, Scilab, ROOT, L^AT_EX
Simulation Softwares: COMSOL
Operating Systems: Linux, Windows

INTERNSHIPS and WORKSHOPS (relevant)

JENNIFER2 Summer School July 2021
Japan and Europe Network for Neutrino and Intensity Frontier Experimental Research

- Attended lectures on theoretical and experimental heavy-flavour and neutrino physics, accelerator and detector physics, and statistics and machine learning.
- Selected for post-JENNIFER2 summer school project work. Analysed J/ψ particle data using ROOT. Used the RooFit mechanism to fit the data to a specific distribution (here, third order Chebyshev polynomials).

Particle Physics Summer Student Programme July 2021
Institute of Nuclear Physics Polish Academy of Sciences (IFJ PAN), Poland
Studied nucleon-neutrino interactions in the ND280 detector of the T2K experiment and presented the work in the closing conference.

Summer School in Astronomy and Astrophysics May 2021 - June 2021
Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune, India
Attended a five-week-long summer school on the basics of astronomy, astrophysics and cosmology.

InPTA Student Week April 2021
Indian Pulsar Timing Array
Attended lectures on pulsar timings and advanced imaging techniques.

Summer School in Plasma Physics June 2020 - July 2020
Studied plasma and solitary structures. Presented a poster in the closing conference.

Astronomy Boot Camp June 2019 - July 2019
Nehru Planetarium, New Delhi, India
Attended lectures on positional astronomy, exoplanets, stellar nucleosynthesis, galaxy evolution, X-ray astronomy, radio astronomy, and cosmology. Attended introductory courses on General Relativity and N-body simulations.

**HONOURS
(relevant)**

Polish Academy of Sciences: Summer Fellowship

July 2021

Was one of the 36 internationally selected candidates for the summer programme at IFJ PAN, Poland.

Physics Training and Talent Search Programme

July 2021

Ahmedabad University and Infosys Science Foundation

Was one of the 35 nationally selected participants. Offer declined.

Machine Learning Hackathon

May 2021

Indian Institute of Technology, Mandi, India

Bagged the third position in the twelve hours-long computational astrophysics hackathon out of a pool of roughly fifty teams from all across the nation.

IIT-JAM Physics

2021

Secured an All India Rank of 164 out of 14298 appearing candidates.

National Graduate Physics Examination

2021

Indian Association of Physics Teachers

Delhi State topper.

INSPIRE Science Camp

2016

Shivaji College, University of Delhi, India

Was selected for a five-day-long workshop based on meritorious performance in class X, organised by the Department of Science and Technology, India.