

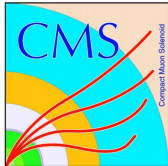


David Lange

*Research Staff
Department of Physics
Princeton University*
David.Lange@cern.ch

My research:

Software integration, analysis techniques, event reconstruction performance optimization, CMS experiment and DIANA project



My expertise is:

- Event generation, detector simulation, event reconstruction techniques in HEP

A problem I'm grappling with:

- Leveraging scientific python for HEP

Something I find very interesting is:

- The vast, but unknown to expert application developers, resource usage of analysis applications in HEP (or at least CMS)

I want to know more about:

- Synergies of HEP techniques with academic+industry community developed tools and applications





Arun Kumar

*Assistant Professor
Department of Physics & Astrophysics
University of Delhi*
Arun.Kumar@cern.ch

My research:

Higgs boson physics, SM vector boson precision measurements, Lepton triggers performance studies, Usage of machine learning to improve analyses and physics objects performance, Detector R&D



My expertise is: Physics Data Analysis

A software and computing problem I'm grappling with: whatever keeps you awake at night

Something I find very interesting is: what I dream about

I want to know more about: what I want to learn about at this workshop and in the future





Peter Elmer

*Senior Research Physicist, Princeton University
Executive Director and Lead PI for the Institute for Research
and Innovation in Software for High Energy Physics (IRIS-HEP)*
Peter.Elmer@cern.ch

My research:

The CMS Experiment at CERN, as well as the R&D to prepare the software and computing systems required to operate and produce scientific results from the HL-LHC and other HEP experiments in the next decade.



My expertise is:

High Energy Physics (HEP) software and computing, large software/computing projects

A problem I'm grappling with:

Recognizing echo chamber effects in our thinking and organizations, and finding ways to create more dynamic and sustainable research software collaborations (e.g. HSF-India!) to address our challenges.

Something I find very interesting is:

HEP software challenges in the next 10 years...

I want to know more about:

Places where HEP problems overlap with the larger research community; ideas & prior experience which show how we might collaborate on those problems.

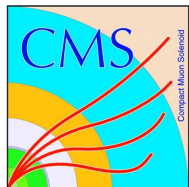




Jim Pivarski

Research Scientist at Princeton

My research: Growing the Pythonic HEP ecosystem, particularly as lead developer of Uproot and Awkward Array



My expertise is: Python, vertical scaling, array-oriented programming

A software and computing problem I'm grappling with: involving more people in scientific Python, both as users and developers, bridging Awkward Array with everything, including ROOT and RDataFrame, generalizing its applicability beyond HEP

Something I find very interesting is: Julia, portable GPU programming, Arrow, Parquet, Zarr

I want to know more about: what everyone else is working on/thinking about... the direction of HEP analysis software today





Rafael Coelho Lopes de Sa

Assistant Professor
University of Massachusetts Amherst

My research: Higgs Physics, Silicon Tracker Mechanics, Simulation Based Inference, Distributed Computing. ATLAS experiment, previously CMS and D0 experiments.



My expertise is: Higgs physics

A software and computing problem I'm grappling with: simulation-based inference

Something I find very interesting is: thinking about the next big discovery in particle physics

I want to know more about: how to use ML methods to make better use of the LHC data





Gordon Watts

*Professor of Physics
University of Washington, Seattle.*

My research: Hidden Sector models with unique long-lived particle signatures. Machine Learning techniques and tools, and analysis software.

My expertise is: Physics at the LHC, Software & Computing, Machine Learning

A software and computing problem I'm grappling with: Make it fast to analyze HL-LHC sized datasets for physics!

Something I find very interesting is: How is GPT-4+ going to change how we access physics at the HL-LHC?

I want to know more about: I'm fascinated by the low level interaction between python and C++ and how we can make that "easy" and "automatic".





Philip Chang

Assistant Professor
University of Florida

My research: My primary focus is on the investigation of the electroweak and the Higgs sector of the Standard Model (SM) through studying production of multiple massive particles, namely top, W, Z, and Higgs boson.

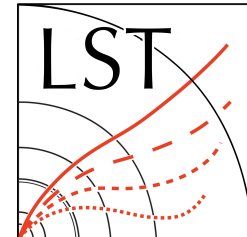
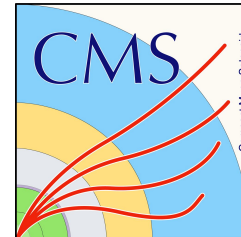


My expertise is: Charged-particle tracking algorithm on heterogeneous architecture

A software and computing problem I'm grappling with: addressing the challenges of exponentially increasing computing resource usage at the High-Lumi LHC (HL-LHC)

Something I find very interesting is: Can detector designs of the future be motivated by reconstruction software perspective?

I want to know more about: I want to learn about physics computing challenges in HEP beyond just LHC but in other experiments





Christopher Tunnell

*Associate Professor
Rice University, Houston*

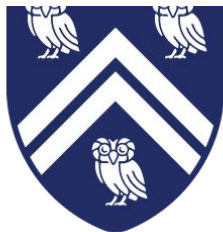
My research: dark matter and neutrinos searches, software stacks for reconstruction and simulations, novel machine learning applications

My expertise is: research software and machine learning on non-collider particle experiments e.g. XENONnT

A software and computing problem I'm grappling with: Spatiotemporal geometric deep learning on HEP data, self-learning ML for commissioning, ML-accelerated global fits

Something I find very interesting is: how to be a responsible academic in a climate crisis, gravitational dark matter direct detection

I want to know more about: you





Ianna Osborne

*Research Software Engineer,
Princeton University*

My research interests are centered around the development and optimization of software for High-Energy Physics experiments

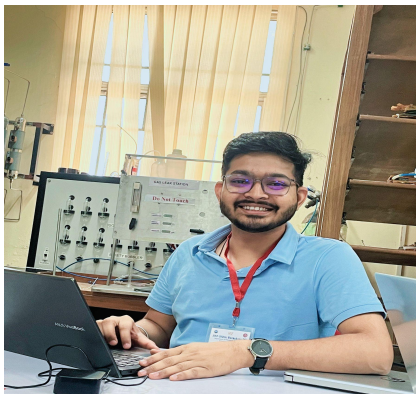
My expertise is: creating scalable and sustainable software solutions for scientific research

A software and computing problem I'm grappling with: making different programming languages work together

Something I find very interesting is: sustainable computing practices

I want to know more about: feedback and requests from users to make sure the tools developed meet the actual needs of the scientific community





Chandra Prakash

Research Scholar

University of Delhi, Delhi, India
chandra.prakash@cern.ch

My research: my primary research focus is the research and development of the Gaseous detector such as Gas Electron Multiplier(GEM) and RPC detector for the High-Energy Physics Experiments.

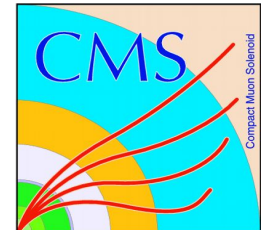


My expertise is: I specialize in Radiation Detection & Measurements, Signal Processing, and Instrumentation within High Energy Physics. Additionally, I have extensive experience in assembling GEM and RPC detectors.

A software and computing problem I'm grappling with:

Something I find very interesting is:

I want to know more about: **what I want to learn about at this workshop and in the future**





Aashik Safar

Project Intern, University of Delhi

My research: *my primary research focus is detector development and research for studying and identifying particles beyond standard model and my mentor is Prof. Md. Naimuddin.*

My expertise is: GEM detectors

A software and computing problem I'm grappling with: whatever keeps you awake at night

Something I find very interesting is: building detectors for identifying invisible particles

I want to know more about: I would like to learn more about event generation softwares and application of machine learning in HEP



Gokul Nagarajan

*Project Associate
Delhi University*

My research Interest: *Neutrino
Physics.*

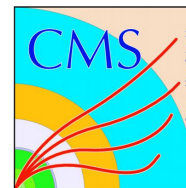
*Current working in GEM detector
data analysis.*

My expertise is: Programming languages and
data analysis

**A software and computing problem I'm
grappling with:** Multiprocessing and integrating
GPUs in data analysis, integrating different
languages together for better interface and
optimum speed.

Something I find very interesting is: The
smallest particles exhibits the most complex
behaviours.

I want to know more about: Various simulation
softwares and accelerating them using GPUs

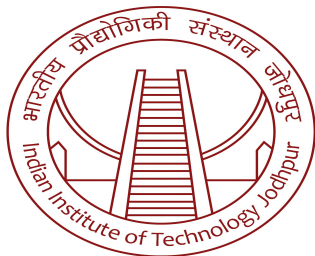




Prisha Gagneja

Research Scholar,
Indian Institute of Technology,
Jodhpur

My research: I am working in flavor physics in collaboration with Belle 2 experiment.



॥ त्वं ज्ञानमयो विज्ञानमयोऽसि ॥

My expertise is: **whatever**

A software and computing problem I'm grappling with: **whatever keeps you awake at night**

Something I find very interesting is: **what I dream about**

I want to know more about: **what I want to learn about at this workshop and in the future**





Sunil Kumar

Ph.D Research Scholar

*Himachal Pradesh University,
Summerhill Shimla*

My research: Dense matter,
Compact stars, RMF , Dark matter.

My expertise is:

A software and computing problem I'm grappling with:

Something I find very interesting is:

I want to know more about: I want to learn about the parallel programming with GPU at this workshop and use it in my future work to fasten my calculations.



Mukul Kumar

*Ph.D Research Scholar
Himachal Pradesh University
Summerhill Shimla-05*

My research: Relativistic Mean Field Model, Neutron Star, Theoretical Nuclear Physics



My expertise is: Relativistic Mean Field Model

A software and computing problem I'm grappling with: To constrain the Equation of state of dense matter objects like Neutron Star, Quark Star, Magnetars etc.

Something I find very interesting is: How next generation space telescopes like JWST and others are going to change our perception of the observable universe.

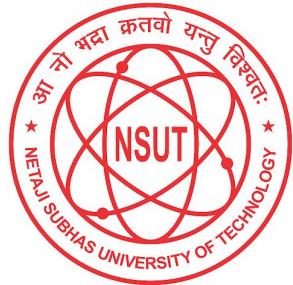
I want to know more about: GPU based programming, Machine Learning and Quantum Computing.



Prabhjeet Kaur

*MSc Physics Student (1st year)
Netaji Subhas University of Technology, Delhi*

My research: summer research internship
at Solid State Physics Laboratory, DRDO.
Python programming
Yet to decide my project work topic



My expertise is: **whatever**

A software and computing problem I'm
grappling with:

Something I find very interesting is: **what I
dream about**

I want to know more about: **what I want to
learn about at this workshop and in the future**



Kavya Wadhwa

*1st year B.Sc Student
Department of Physics
Pandit Deendayal Energy University
kavya.wbsc23@spt.pdpu.ac.in*

My research: Student research project under Dr. Apoorva Bhatt to build a detector like Ice Cube but a very small version of that to be assembled on a table top, and then checking simulated results with the actual results.

A software and computing problem I'm grappling with: Using monte-carlo methods of simulation, Geant4 to simulate particle interactions, building detector geometries from scratch.

I'm interested to know more about using ML models like GAN to dive deep with particle simulation.





Abdul Rahaman Shaikh

*Research Scholar
Centre for Theoretical Physics
Jamia Millia Islamia
New Delhi-110025, India*

My research: Theoretical High
Energy Physics

My expertise is: QFT and Beyond Standard
Model of Particle Physics, Mathematica,
FeynCalc

**A software and computing problem I'm
grappling with:** **Micromega, Sarah**

Something I find very interesting is:
Machine Learning and AI

I want to know more about: High Energy
Physics Data Analysis





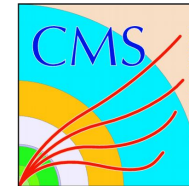
Hemant Kumar

*Research Engineer
Instituto de alta investigación
universidad de tarapacá, Chile*

My research: *My primary research
focus is GEM R&D and gaseous
detector assessment.*



UNIVERSIDAD DE TARAPACÁ
Universidad del Estado



My expertise is: Electronics commissioning, GEM assembly, design and development of small mechanical and pneumatic system

A software and computing problem I'm grappling with: Plotting in ROOT and MATLAB

Something I find very interesting is: The need for HUGE apparatus to detect the smallest particles.

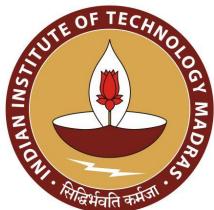
I want to know more about: The Application of programming and techniques in HEP.



Saloni Atreya

Project Student,
IIT Madras,
Experimental high energy physics.

My research: my primary research focus is search for a spin-zero high mass resonance decaying to ZZ to $2l2\nu$ final state under the guidance of Prof. Prafulla Kumar Behera.



My expertise is: Data analysis

A software and computing problem I'm grappling with: I have started the analysis using C++ in ROOT framework and yet to learn more.

Something I find very interesting is: BSM Higgs and the analysis.

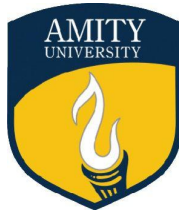
I want to know more about: I want to learn about Python, machine learning and C++ techniques for the analysis at this workshop and in the future.



Niharika Shrivastav

*B.Sc Physics student (2nd Year)
Amity University
Experimental High Energy Physics*

My research: My primary research focus is on collider (LHC) physics. I work on proton-proton collisions at 13.6 TeV and study the spectra of charged hadrons produced in these collision. My mentor is Dr. Bibhuti Parida.



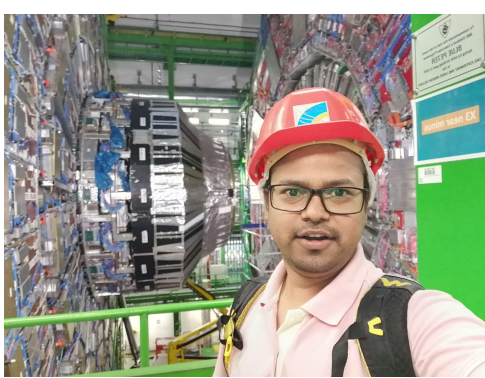
My expertise is: Working on PYTHIA and ROOT.

A software and computing problem I'm grappling with: Writing RIVET analyses.

Something I find very interesting is: Investigating kinematic spectra of particles produced in collision.

I want to know more about: Using python to write my PYTHIA analysis and subsequently learn PyRoot.





Arjun Chhetri

Research Scholar,
University of Delhi,
arjun.chhetri@cern.ch

My research: *My research focuses on search for Vector-like Quarks under the guidance of Prof. B. C. Choudhary in the CMS Experiment. I have developed $H \rightarrow WW^* \rightarrow 4q$ tagger (first of its kind) based on Deep-AK8,*



My expertise is: *Vector-like Quarks, High Energy Physics (HEP) analysis based on C++, python, DNN, Higgs Combine Tool*

A software and computing problem I'm grappling with: *Enhancing the efficiency of High Energy Physics (HEP) tools through GPUs based parallel computing, coupled with more effective troubleshooting. Further aligning HEP tools with physics principles for improved performance.*

Something I find very interesting is: *How could we, experimental physicists remain impactful in the future amidst improving AI?*

I want to know more about: *As much as I could learn from the experts about Machine learning and parallel programmings*





Riya Gaba

*Research Scholar,
Department of Physics
Panjab University
Chandigarh
India*

My research: *Supernova neutrinos,
Assembly and characterization of GEM
detector
My supervisor: Prof. Vipin Bhatnagar*

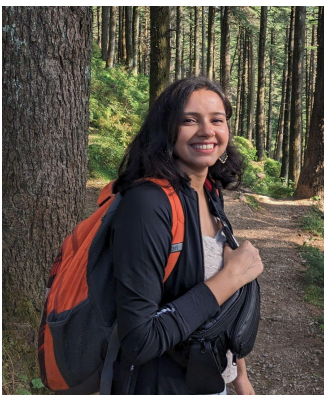


My expertise is: Simulations of supernova neutrinos using Genie, Marley, SNOwGLoBES.

A software and computing problem I'm grappling with: Calculating systematics for future detectors like DUNE for supernova neutrinos.

Something I find very interesting is: never ending search for more fundamental particles..

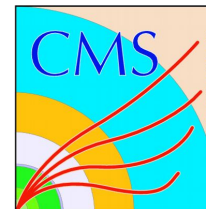
I want to know more about: I am very interested in exploring the methods and tools to handle data and get some beautiful insights out of it.



Kalpna

PhD student, Department of Physics and
Astrophysics
University of Delhi, Delhi
ktiware@cern.ch

My research: Characterization of
microstrip silicon sensors for Phase 2
CMS Outer Tracker, TCAD Simulation of
Silicon detectors



My expertise is:

**A software and computing problem I'm
grappling with:**

Something I find very interesting is:

I want to know more about:



Rishabh Mehta

Research Scholar,
Tata Institute of Fundamental Research, Mumbai
rishabh.mehta@tifr.res.in

My research: I am working on time dependent CP violation measurements in B physics under Prof. Gagan Mohanty in Belle and Belle II experiments. I am also developing software toolkits for the collaboration.



My expertise is: HEP analysis tools in python (pyROOFIT and pandas) and software/toolkit development.

A software and computing problem I'm grappling with: The processing time of pyroofit to generate projections of a multidimensional fit. A pythonic way to write fit models as robustly as roofit.

Something I find very interesting is: Application of a particle net esque algorithm for signal identification and background reduction in the event topology as Belle II.

Use of differential programming for end to end analysis optimisation directly on the precision and accuracy of the observables.

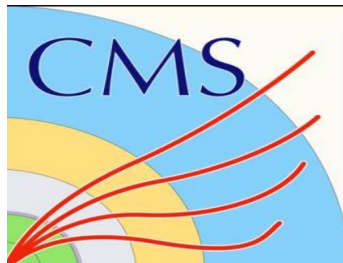
I want to know more about: Parallelization of the fit process. Use of uproot as a meaningful replacement for RDataframe.



Kashish Verma

I am a PhD student at Panjab University under Prof. Vipin Bhatanagar

My research: I am a new PhD student and I will be joining the CMS experiment and currently i have been working in the hardware field in GEM detectors



My expertise is:

A software and computing problem I'm grappling with: currently I am only learning the coding languages and some softwares used in HEP

Something I find very interesting is: what I dream about

I want to know more about: what I want to learn about at this workshop are the tools and softwares that i will be using for my research during PhD

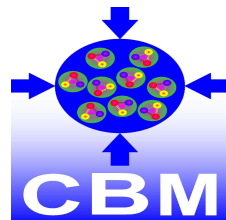


Towseef Ahmad Bhat

*Ph.D. Student,
University of Kashmir*
t.bhat@gsi.de

My research:

My research focuses on the study of multi-strange particles in the CBM experiment at FAIR energies and my mentor is Prof. M. Farooq Mir.



My expertise is:

Simulation of heavy-ion collisions, Event generation, Analysis techniques based on C++ and CBMRoot.

A software and computing problem I'm grappling with:

trying to apply machine learning to speed up event generation.

Something I find very interesting is:

How hybrid models together with machine learning can improve simulation accuracy and efficiency for the success of any HEP experiment.

I want to know more about:

simulation techniques, parallel programming, and machine learning.





Daljeet Kaur

*Assistant Professor,
SGTB Khalsa College, University of Delhi
Area of research : Neutrino Physics*

My research:
***My research interest in Neutrino
Oscillation physics and phenomenology***

My expertise is: Neutrino simulation using
C++ and Root

**A software and computing problem I'm grappling
with:** Globes Neutrino simulation

Something I find very interesting is: *Neutrino as
dark matter candidate*

I want to know more about: I want to learn different
machine learning tools and techniques that help in
neutrino oscillation physics.





Ayush Shenoy

*Undergrad,
Mumbai University
ayush.shenoy92@gmail.com*

My research: I'm working on developing improved methods for analysis of reactive molecular dynamics data with Dr. Sagar Pandit at USF

My expertise is: Reactive molecular dynamics with ReaxFF

A software and computing problem I'm grappling with: Designing tools for parallelized MD data analysis with Dask and xarray

I want to know more about: HEP computational tools in general, GPU programming





Kaustava Karmakar

*Project Student, Experimental High
Energy Physics, Banaras Hindu
University*

My research: Currently I am learning C++ and ROOT under the guidance of Professor Ajay Kumar

My expertise is: Nuclear and Particle Physics

A software and computing problem I'm grappling with: C++ and ROOT

Something I find very interesting is: Machine Learning in High Energy Physics

I want to know more about: Machine Learning



Ishant Yadav

*Student, Banaras Hindu University,
interests in Quantum Computation
and Nuclear Physics*

My research:



My expertise is: whatever

A software and computing problem I'm grappling with: whatever keeps you awake at night

Something I find very interesting is: integrating statistical and ML methods with physics to discover undiscovered phenomena.

I want to know more about: scientific programming and more clear vision for choosing career fields.



Anju Sharma

*Research Scholar,
Aligarh Muslim University, Aligarh
Experimental high energy physics*

My research: *my primary research
focus is data analysis and my mentor
is Dr. Nazeer Ahmad*

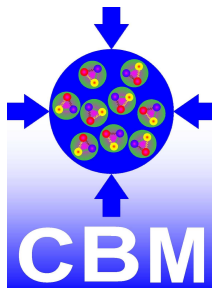


My expertise is: ROOT, CBMRoot, UrQMD model, AMPT model, C++ programming

A software and computing problem I'm grappling with: Machine learning which is an important part of analysis.

Something I find very interesting is: Python is mostly used language in scientific programming and I have to learn more about it.

I want to know more about: Machine learning and Python





Kush Maithani

PhD Student.

HNB garhwal University, Srinagar Garhwal

kushm.mai98@gmail.com

My research: *Black Hole Physics
and Particle Astrophysics
under the supervision of Prof.
Hemwati Nandan Pandey*



My expertise is: General relativity and Particle
Astrophysics

**A software and computing problem I'm
grappling with:** whatever keeps you awake at
night

Something I find very interesting is: what I
dream about

I want to know more about: what I want to
learn about at this workshop and in the future



Rajiv Gupta

rajiv.ehep@bhu.ac.in

*Department of Physics
Institute of Science
Banaras Hindu University*

My research: Device simulation of radiation hard Silicon and 4H-SiC sensors, Gain enhancement study of GEM detectors, study of exclusive event like DVCS. I'm working under the supervision of Dr. Ajay Kumar who is part of CMS collaboration.

My expertise is: Device simulation, Ansys and Garfield simulations, ROOT analysis.

A software and computing problem I'm grappling with: Simulation of 4H-SiC sensors and gain enhancement study by varying various geometrical and concentration parameters using SILVACO.

Something I find very interesting is: EIC Physics processes, radiation hardness study of LGADs, Exploring Machine learning to incorporate in HEP analysis.

I want to know more about: Machine Learning algorithms, Detector simulations using GEANT4, EIC physics processes.





Sunidhi Saxena

Ph.D Student, Department of Physics, Banaras Hindu University, Interested in CMS experiment

sunidhisaxena@bhu.ac.in

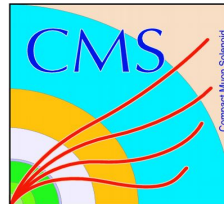
My research: I'm studying vector boson scattering which is one of the tool for measuring validity and accuracy of electroweak symmetry breaking and higgs coupling. I'm also learning detector design simulation mainly focusing on AC-LGAD. I'm working under the supervision of Dr. Ajay Kumar who is part of CMS collaboration and our collaborator is R. K. Sharma from CERN.

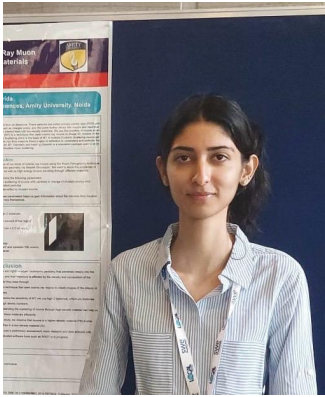
My expertise is: Event generation using MadGraph5, Detector response simulation, C++ programming language, CERN Root, Silvaco

A software and computing problem I'm grappling with: Madgraph event generator, Delphes detector simulator, Silvaco detector simulator

Something I find very interesting is: To search new physics beyond the standard model.

I want to know more about: I want to learn ML in detail because that will be helpful in order to discriminate signal and background and want to learn flavour tagging.





Ria Kataria

riaktr21@gmail.com

Final semester Master's student at Amity University, Noida.

I am actively seeking a PhD position for the upcoming jan'25 semester.

My research: Understanding Muons produced by TeV-PeV Cosmic Rays and understanding the discrepancies between simulated and the experimental data observed by the GRAPES-3 Experiment, CRL. With a soft focus on the "muon puzzle".

Under the supervision of Dr. Bibhuti Parida and Dr. Pavata K. Mohanty.

My expertise is: Cosmic Rays, muons, simulation tools like CORSIKA and GEANT4 and analysis tools like ROOT.

A software and computing problem I'm grappling with: The math that goes behind hadronic interaction models like EPOS-LHC, QGSJET and SIBYLL.

Something I find very interesting is: Beyond Standard Model physics and dark matter searches. The role of cosmic rays in understanding dark matter.

I want to know more about: Implementing GPU programming in simulation tools like CORSIKA for faster simulations. Understanding the role of ML in astroparticle physics.

