



# 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](mailto: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 2020s.

## 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 to address our challenges.

## I've got my eyes on:

HEP software challenges in the 2020s...

## I want to know more about:

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



# Sudhir Malik

*Professor of Physics  
University of Puerto Rico - Mayagüez  
malik@fnal.gov*

## **My CMS work:**

Physics analysis on Beyond Standard Model Physics -  
Exotica, Supersymmetry  
Pixel Detector, Software Training



**My expertise is:**  
Still learning

**A problem I'm grappling with:**  
Never enough time to learn new tools

**I've got my eyes on:**  
Learning Physics Analysis using Coffea

**I want to know more about:**  
Machine Learning, Quantum Computing





# Henry Schreiner



*Research Software Engineer /  
Computational Physicist*  
<https://iscinumpy.dev>

**My research:** *Histograms,  
Packaging and distributions, tutorials,  
C++ - Python, Scikit-HEP, scikit-build*



UPROOT<sup>4</sup>-BROWSER

**My expertise is:** Python, Python packaging (PyPA member, maintain lots of conda-forge recipes like Numba), Homebrew, C++ interop (pybind11), Pyodide (web assembly CPython port), CMake, Ruby, websites, CI, scikit-build

**A software and computing problem I'm grappling with:** Distributing code (especially compiled python extensions) to students and new users, including with GPUs

**I've got my eyes on:** Rust, Pyodide (see <https://scikit-hep.org/developer/reporereview> or <https://henryiii.github.io/level-up-your-python/live>)

**I want to know more about:** How people are using the tools we are building, how they can all work together, what challenges have been faced.



pybind11



# 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

**I've got my eyes on:** 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



# Oksana Shadura

*Software engineer at University  
Nebraska-Lincoln, IRIS-HEP Analysis  
Grand Challenge Co-coordinator*

**My research:** Development of a prototype of  
Analysis Facility for HL-LHC

**My expertise is:** Analysis Facilities and Data Organization, Management and Access (DOMA)

**A software and computing problem I'm grappling with:** development of new cyberinfrastructure for data analysis, integration of data delivery and data organisation & management solutions

**I've got my eyes on:** software challenges for HL-LHC

**I want to know more about:** to understand better community requirements or how we are planning to organise more efficient data analysis for HL-LHC





# Alexander Held

*Postdoc at the University of Wisconsin-Madison, ATLAS member, IRIS-HEP Analysis Grand Challenge Co-coordinator*

**My research:** *Higgs physics in ATLAS, statistical analysis (including tooling)*

**My expertise is:** Higgs physics, statistical analysis, Scikit-HEP stack

**A software and computing problem I'm grappling with:** finding patterns for handling systematic uncertainties in end-user analysis code that are highly readable yet computing efficient

**I've got my eyes on:** creating more public resources that showcase end-user analysis workflows beyond minimal examples

**I want to know more about:** which challenges other members of the community would like to tackle in the next five years





# Kilian Lieret

*PhD candidate at  
Ludwig-Maximilian-University of  
Munich, Belle II Experiment*

**My research:** Calibrating ML  
algorithms, clustering, measuring  $V_{cb}$ ,  
organizing software training at Belle II  
and at HSF



**My expertise is:** Scientific python stack

**A software and computing problem I'm grappling with:** How to kill the boilerplate of analysis code and avoid people reinventing the wheel; how to get everyone to work together on sustainable software training material/events

**I've got my eyes on:** probabilistic programming frameworks and applications

**I want to know more about:** upcoming challenges, potential new projects

since this month  
→



**PRINCETON  
UNIVERSITY**



Institute for Research & Innovation  
in Software for High Energy Physics



# Steve Lantz

*Senior Research Associate  
Cornell University Center for Advanced Computing  
steve.lantz ~at~ cornell.edu*

## **My research:**

Computational research in applied physics, high performance computing

## **My expertise is:**

HPC code optimization, parallel programming

## **A problem I'm grappling with:**

How to introduce performance-oriented techniques into scientific codes without obscuring the science; how to get researchers to care about code quality and maintainability (software engineering)

## **I've got my eyes on:**

Platform-(quasi)-independent parallel APIs for CPUs and GPUs; Julia

## **I want to know more about:**

Machine learning (so I'm usually a student here as well as a presenter)



**Cornell University**  
Center for Advanced Computing



# Bei Wang

*Ph.D. in computational science and engineering  
HPC Software Engineer for IRIS-HEP  
Research Computing/OIT at Princeton University  
beiwang@princeton.edu*

## **My research:**

- High performance computing
- High order particle-in-cell methods for kinetic equations

## **My expertise is:**

Code development and optimization on modern computing architectures, such as GPU and Intel Xeon processors. Parallel programming models, MPI, OpenMP etc

## **A problem I'm grappling with:**

Start learning tracking algorithms and their parallel implementations in HL-LHC

## **I've got my eyes on:**

Interdisciplinary research software collaborations

## **I want to know more about:**

High performance python, machine learning



# Tim Mattson

*Intel labs Senior Principal Engineer and PI of Intel's Science and Technology center at MIT*

## My research:

Parallel programming ... both programming languages and parallel design patterns.

Array storage engines, polystore DBMS, and Graph Algorithms (the GraphBLAS).

AI to generate software and to replace key algorithms in data systems (my MIT collaboration)

## My expertise is:

All things “parallel computing”; from programming languages and hardware to parallel design patterns. I helped create both OpenMP and OpenCL.

Oh, and kayaking ... I am kayak-surf bum and a professional kayak coach.

## A problem I'm grappling with:

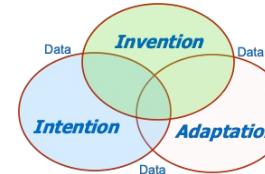
Use abstract algebra to unify key-value, SQL, and array query notations and then wrap them around graphs in the language of linear algebra

## I've got my eyes on:

Modern C++ as a language for end-user communities to define their own Domain specific languages.

## I want to know more about:

Physics is my passion. Computer Science is boring ... It's just a tool to help us understand physics.



**Data Systems for AI**  
 for Data Systems



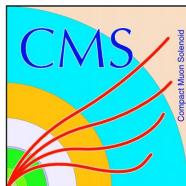
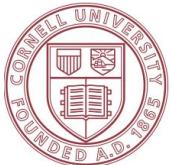


# Dan Riley

*Research Associate, Cornell University*

## **My research:**

Multi-threaded frameworks  
Parallelization and vectorization of HEP event reconstruction software (currently mostly tracking)  
High-availability clusters for experiment control and data acquisition



## **My expertise is:**

C++, threading, reliable communication protocols

## **A problem I'm grappling with:**

Identifying the bottlenecks in complex vector/parallel code

## **I've got my eyes on:**

How will consumer “AI” applications like self-driving cars change the hardware landscape?

## **I want to know more about:**

Machine learning, quantum computing

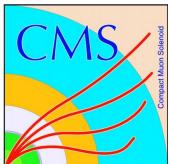


# David Lange

*Research Staff*  
*Department of Physics*  
*Princeton University*  
[David.Lange@cern.ch](mailto: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

## I've got my eyes on:

- 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





# Ma. Florevel (Floe) Fusin-Wischusen

## Institute Manager

Princeton Institute for Computational Science & Engineering (PICSciE)

Princeton University

335 Peter B. Lewis Library

Office: (609) 258-8071 / Mobile: (267) 733-3425

[floe@princeton.edu](mailto:floe@princeton.edu)

[www.princeton.edu/researchcomputing](http://www.princeton.edu/researchcomputing)



# Maureen Carothers

*Finance and Grants Administrator, Princeton Institute for Computational Science and Engineering (PICSciE)*

*Project Office, Institute for Research and Innovation in Software for High Energy Physics (IRIS-HEP)*

[mcc3@princeton.edu](mailto:mcc3@princeton.edu) / 609-258-2023



# Andrea Rubinstein

*Administrative Staff, Princeton Institute for  
Computational Science and Engineering (PICSciE)*

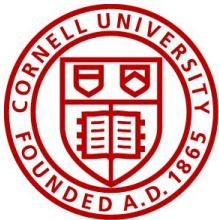
[alrubins@princeton.edu](mailto:alrubins@princeton.edu) / (609) 258-1397



# Michael (Tres) Reid

*Physics Ph.D. Student  
Cornell University  
CMS Experiment Collaborator  
mgr85@cornell.edu*

**My research:**  
CMS experiment at CERN. I work on software upgrades for the CMS tracker and EXO searches at CMS.



Cornell Laboratory for Accelerator-based Sciences and Education (CLASSE)

**My expertise is:**

Data analysis in CUDA, Python, C++ and ROOT.

**A problem I'm grappling with:**

Parallelization and vectorization of the CMS track reconstruction algorithms.

**I've got my eyes on:**

GPU programming and parallel computing

**I want to know more about:**

Computer architectures, parallel computing, Machine learning and data mining.





# Andrew Loeliger

*New post-doc at Princeton, and I maintain a very general interest in whatever particle physics and computer topics I can get involved with.*

**My research:** Higgs Physics, Tau Physics, CMS Trigger Systems and Monitoring.

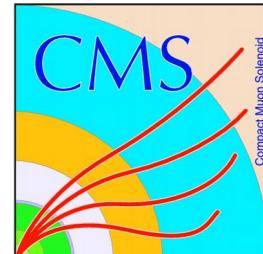
*Looking at branching into BSM searches and bb final states?*

**My expertise is:** Higgs and Tau Physics. CMS's Calo L1 DQM systems.

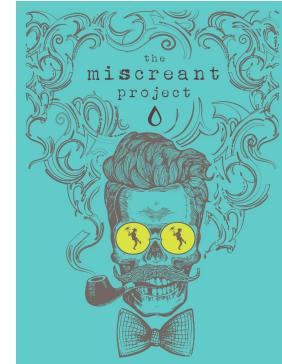
**A software and computing problem I'm grappling with:** Integration of machine learning anomaly detection techniques for triggering (typically involving non-traditional/non-python ML environments).

**I've got my eyes on:** Being involved in the development of computing techniques for whatever the next collider may be.

**I want to know more about:** Parallelization techniques and ML techniques



My family's wine labels





# Adrian Alan Pol



*Postdoctoral Research Associate at Princeton University*  
[adrian.pol@cern.ch](mailto:adrian.pol@cern.ch), [ap6964@princeton.edu](mailto:ap6964@princeton.edu)

## My research:

Machine learning and its applications to hardware trigger  
at CMS

## My expertise is:

Computer vision, anomaly detection, model  
compression

## A problem I'm grappling with:

How to trigger on new physics, anomaly  
detection in a resource limited environment

## I've got my eyes on:

arxiv

## I want to know more about:

Computing for HEP



# Ioana Ifrim

Research Staff - Princeton University

**My research:** Awkward Array v2, GPU accelerated Automatic Differentiation

**My expertise is:** ML, Python, C++

**A software and computing problem I'm grappling with:** interactive Python & C++ integration in Jupyter Notebooks

**I've got my eyes on:** insights into community's research directions

**I want to know more about:** HEP applications ecosystem



# Pallabi Das

*Postdoctoral research associate,  
Princeton University, CMS  
experiment*

**My research:** *Level-1 trigger, HLT,  
Higgs analyses*

**My expertise is:** Trigger algorithm development, trigger performance studies, jet and missing momentum reconstruction and performance

**A software and computing problem I'm grappling with:** GNN applications for jet identification

**I've got my eyes on:** Improvements in Run-3 trigger and analyses in CMS experiment

**I want to know more about:** New machine learning and computing approaches in HEP





# Mohamed Elashri

*Physics PhD Student (University of Cincinnati)  
LHCb Collaboration Member  
mailto:[mohamed.elashri@cern.ch](mailto:mohamed.elashri@cern.ch)*

## My research:

- *BSM searches*
- *Search for long lived particles signatures*
- *GPU Programming and Data triggering*



## My expertise is:

- MC Simulation
- ML and particle identification
- ROOT, Python, C++
- Reading Hacker News

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

- Writing a new simulation framework for a new SUSY search program in LHCb
- Use deep learning to locate particle decay vertices.

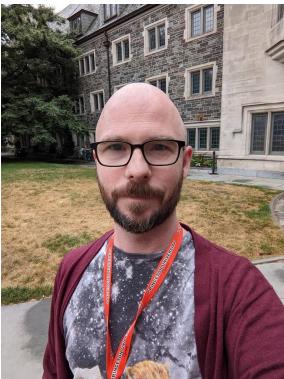
## I've got my eyes on:

- Developments in deep learning and HEP applications
- Physics Particle Tracking and Decoding Using GPUs and parallel programming
- Future Quantum Computers usage in HEP

## I want to know more about:

- Parallel programming best practises
- Multi-threaded frameworks
- Physics and People





# Robert Tabb

**Doctoral Candidate at The  
University of Nebraska - Lincoln  
Member of CMS Collaboration**

**My research: A Drell-Yan Cross  
Section Analysis in three dimensions**



UNIVERSITY of NEBRASKA  
LINCOLN



**My expertise is:** Experimental HEP

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

**I've got my eyes on:** Writing my thesis to  
graduate in the spring

**I want to know more about:** Using python for  
data analysis



*This is Scooter being a turtle*



# Lanqing Yuan

*Physics PhD student (2nd year);  
Generally interested BSM particle detection  
experiments*

**My research:**  
*Search for dark matter and other rare events in  
noble liquid detectors*

**My expertise is:** Writing bugs...? 😭

**A software and computing problem I'm  
grappling with:** Code acceleration techniques  
(Apparently I refused to admit my stupid  
algorithms should be fixed first)

**I've got my eyes on:** Machine learning based  
detector response monitoring and event  
reconstruction

**I want to know more about:** Parallel  
computing; Applications of deep learning; Data  
mining.



**Kavli Institute**  
for Cosmological Physics  
at the University of Chicago



**XENON**



# Ben Messerly

*Postdoc, University of Minnesota*  
[mess@umn.edu](mailto:mess@umn.edu), [github](#)

## My research:

- Neutrinos at MINERvA
- Accelerator neutrino interactions
- Mu2e – BSM search, detector commissioning



UNIVERSITY OF MINNESOTA

## My expertise is:

Neutrino interaction cross section measurement,  
neutrino beams, HEP experiment systematics

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

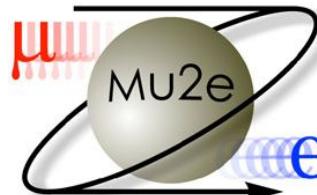
HEP standard analysis tools, data preservation,  
experiment-wide version control (mis)use.

## I've got my eyes on:

IRIS-HEP, Coffea, columnar analysis, open  
science

## I want to know more about:

The latest python HEP analysis tools, speed in  
HEP analysis



This space reserved for your photo, image of an atavar, whatever.

Xuefeng  
Ding

*My professional role, institution, and general areas of interest.*

**My research:** *my primary research focus*

Reserved for your institution's logo, for example

Reserved for your experiment's logo, for example

My expertise is: whatever

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

I've got my eyes on: what I dream about

I want to know more about: what I want to learn about at this workshop

Reserved for some other logo, a photo of your dog, whatever



# Jieun Yoo

*Grad. student, UIC*

**My research:** Pixel Detectors, Higgs Physics, BSM Searches

**My expertise is:** Detector instrumentation & upgrades

**A software and computing problem I'm grappling with:** Updating to columnar analysis tools

**I've got my eyes on:** CMS Run 3

**I want to know more about:** code optimization



UNIVERSITY OF  
ILLINOIS CHICAGO



# Agustin Romero

ar1@stanford.edu

*Master's Student*

**My research:** Experimental cosmology.



# SLAC

My expertise is: CMB particle physics, and instrumentation of superconducting, low-temperature photon detectors.

A software and computing problem I'm grappling with: How to scale, synchronize, and debug thousands of detectors connected to Xilinx FPGAs.

I've got my eyes on: First results of perhaps the most precise CMB data ever.

I want to know more about: HEP experiments.

NATIONAL  
ACCELERATOR  
LABORATORY



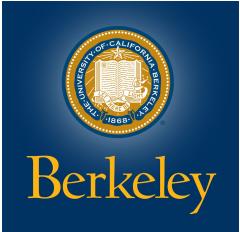


# Irina Ene

*Physics PhD Student  
UC Berkeley / LBNL*

## My research:

- *Track Reconstruction in ATLAS*
- *Higgs to charm studies*



**My expertise is:** Python, ROOT, C++, ML

**A software and computing problem I'm grappling with:** Writing more efficient code (memory management, code refactoring)

**I've got my eyes on:** finishing my PhD and finally having some time to play video games :)

**I want to know more about:** Parallel programming, GPU programming, Columnar data analysis



This space reserved for your photo, image of an atavar, whatever.

# Orgo Neogi

*My professional role, institution, and general areas of interest.*

**My research:** *my primary research focus*

Reserved for your institution's logo, for example

Reserved for your experiment's logo, for example

**My expertise is:** whatever

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

I've got my eyes on: what I dream about

I want to know more about: what I want to learn about at this workshop

Reserved for some other logo, a photo of your dog, whatever



# Evan Massaro

*Computational Science PhD candidate, MIT*

**My research:** *Efficient Monte Carlo methods for the Boltzmann Transport Equation*



**My expertise is:** Scientific computing, Monte Carlo methods, numerical methods, numerical methods for partial differential equations

**A software and computing problem I'm grappling with:** Rewriting code to use more efficient data structures without introducing bugs

**I've got my eyes on:** a PhD, a Threadripper CPU

**I want to know more about:** best practices for developing high performance computing code





# Guillermo A. Fidalgo Rodríguez

*Master's in Physics, University of  
Puerto Rico - Mayagüez,  
High-Energy Physics*

**My research:** *New Trigger for  
Exotic Physics Analysis (EMJ)*



**My expertise is:** Python, ML

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

**I've got my eyes on:** A new Framework laptop,  
a PhD.

**I want to know more about:** C++, Distributed  
computing, CMS software





# Austin Townsend

*Graduate Student, University of Notre Dame, interested in machine learning.*

**My research:** CMS SUSY/TriBoson search

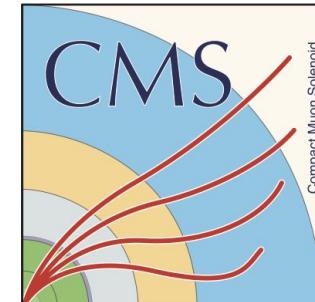


My expertise is: CMS L1 Track Trigger

A software and computing problem I'm grappling with:

I've got my eyes on: **Using ML to solve complex problems**

I want to know more about: **ML for use in HEP**



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# Luis Sanchez

*My professional role, institution, and general areas of interest.*

**My research:** *my primary research focus*

Reserved for your institution's logo, for example

Reserved for your experiment's logo, for example

**My expertise is:** whatever

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

I've got my eyes on: what I dream about

I want to know more about: what I want to learn about at this workshop

Reserved for some other logo, a photo of your dog, whatever



# Amrutha Krishna

*PhD student, Northeastern University.  
CMS experiment at CERN.*

## My research:

- Phase-2 upgrade of CMS, R&D of the barrel layer of Minimum Ionizing Particle Timing Detector (MTD).
- Alignment of ECAL w.r.t tracker for Run 3 of LHC.
- Measurement of Higgs width using  $H \rightarrow \gamma\gamma$  channel.



**My expertise is:** C++, ROOT

**A software and computing problem I'm grappling with:** program optimization, becoming proficient in python.

**I've got my eyes on:** Improving the sensitivity of my analysis using ML methods.

**I want to know more about:** Machine Learning methods for High Energy Physics.





# Johannes Wagner

*Physics PhD Student (3rd Year)  
UC Berkeley / LBNL*

**My research:** *Experimental Particle Physics (strong focus on computational side)*

Berkeley  
UNIVERSITY OF CALIFORNIA

**My expertise is:** Python, C++, ROOT, Deep Learning (esp. Graph Neural Networks), Tracking in ATLAS

**A software and computing problem I'm grappling with:** Improving vertex reconstructions with ML

**I've got my eyes on:** Starting work on my PhD analysis project, finding cool new ML projects

**I want to know more about:** Reinforcement learning, GPU programming, Parallel processing

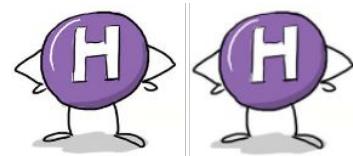




Jem Guhit  
[guhitj@umich.edu](mailto:guhitj@umich.edu)

*Physics PhD Candidate  
University of Michigan  
HEP, Traveling ✈️, Skiing* 

**My research:**  
ATLAS, Di-Higgs Searches



My expertise is: Searching Stackoverflow 😊

A software and computing problem I'm grappling with: GNN Optimization

I've got my eyes on: Efficiently implementing ML Algorithms and applying GPU programming and OpenML to my research

I want to know more about:  
Jokes aside.  
GNNs and OpenMP





# Devin Aebi

*PhD Student at Texas A&M University*

**My research:** CMS, di-Higgs production  $hh \rightarrow bbWW$



**My expertise is:** Python

**A software and computing problem I'm grappling with:** Reading and understanding other people's code :)

**I've got my eyes on:** Learning how to better format my own projects to be more readable and clear

**I want to know more about:** Machine Learning and Columnar Data Analysis





# Shruti De

*Physics PhD Student (2nd Year) at the State University of New York, Albany*

**My research:** *Experimental Astroparticle Physics (Working on Detector Building for Direct Dark Matter Search)*



**My expertise is:** Work on Python, LAMPS Data Analysis software, Have experiences with Root and GArSoft, Learning C++ and Geant4

**Expert Classical Musician - (One of the Social Media Handles -**

<https://www.facebook.com/shruti.de>)

**A software and computing problem I'm grappling with:** Optimizing working efficiency through comparative analysis in search of the best thermal detectors to be used in the new detector mechanism for the dark matter search

**I've got my eyes on:** Particle Accelerators, machine learning tools in accelerator mechanism, Black Holes

**I want to know more about:** parallel computing, machine learning usability, computation tools for simulation based works





# Hyunyong Kim

Postdoctoral Research Associate

**My research:** CMS experiment

My expertise is: Python, C++

A software and computing problem I'm grappling with: C++ memory management  
I've got my eyes on: Automation

I want to know more about: ML





# Brianna Dwyer

*Ph.D. Candidate at Northern Illinois University*

## My research:

- *$H \rightarrow \gamma\gamma$  cross-section measurement*
- *$\gamma\gamma +$  heavy flavor jet production measurement*
- *Cancelled Trigger upgrades (FTK, L1Track/HTT)*



Northern Illinois  
University

**My expertise is:** Python, C++, ROOT

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

**I've got my eyes on:** graduating and finding a data scientist job

**I want to know more about:** real-world applications of ML techniques





# Dinupa Nawarathne

*PhD student, New Mexico State University, FermiLab SpinQuest experiment*

**My research:** *are the sea quarks orbiting around the spin axis of the nucleon ?*

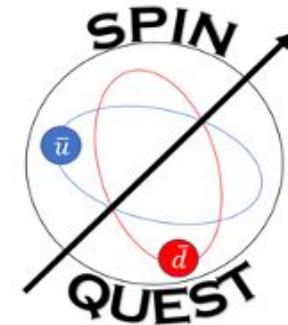


**My expertise is:** python, c++ (ROOT)

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

**I've got my eyes on:** to build efficient software for HEP analysis

**I want to know more about:** ML, optimization





# Towsifa Akhter

*Physics PhD student at Texas A&M University.*

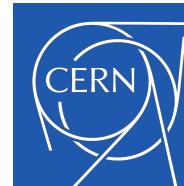
**My research:** CMS, Z' with dimuon final state.

My expertise is: python, root

A software and computing problem I'm grappling with: writing a module on object based reconstruction.

I've got my eyes on: finishing my PhD.

I want to know more about: Machine Learning, other programming languages





# Artem Bolshov

*Graduate student, Texas A&M, and general areas of interest.*

**My research:** *track based muon alignment, BSM double Higgs production study*



**My expertise is:** I used to be string theorist but recently switched to HEP experiment.

**A software and computing problem I'm grappling with:** figuring out how MINUIT minimizer works and how it can be improved or what it can be replaced with

**I've got my eyes on:**

**I want to know more about:** get more practice with python, learn more about data analysis



# Sanjana Sekhar

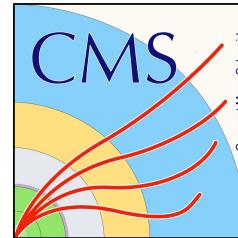
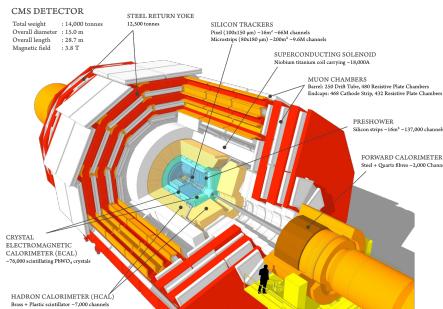
*PhD student (3rd year)*

*Johns Hopkins University*

*Interested in deep learning for HEP, CMS offline software, progressive metal and morning coffee*

## My research:

*CMS Pixel calibration, reconstruction;  
Also finishing up a leptoquark search with  
Drell-Yan events*



**My expertise is:** C++, python

I also sketch/doodle a fair amount and I think I am good at it :D

**A software and computing problem I'm grappling with:** Understanding the GPU based local reconstruction in the CMS Pixel detector, making my reco NN more memory efficient and fast

**I've got my eyes on:** Starting work on a new CMS Anomaly search this fall, and a Porcupine Tree concert <3

**I want to know more about:** Anything and everything about parallel programming, GPU arch and unsupervised learning





# Raees Khan

*PhD student, University of Pittsburgh  
Detector Description Group, ATLAS*

**My research:** *Working on extending experiment independent lightweight simulation software FullSimLight (a Geant4 application).*

**My expertise is:** Python, C++, Geant4

**A software and computing problem I'm grappling with:** *Allowing FullSimLight to read in events in the standard HepMC3 format with Geant4 multithreading working properly.*

**I've got my eyes on:** *Learning more physics and software!*

**I want to know more about:** *I would like to learn more about Machine learning.*





# Evan Koenig

*Graduate student at the University of Florida. Interested in machine learning, music.*

**My research:** *Resonant multi b-jet production at the LHC*



**My expertise is:** Python/c++, GNNs, LHC data analysis

**A software and computing problem I'm grappling with:** Using GNNs to solve combinatorial pairing issues

**I've got my eyes on:** Ph.D

**I want to know more about:** ML methods in HEP

Stylish candid photo of one of my cats Juno

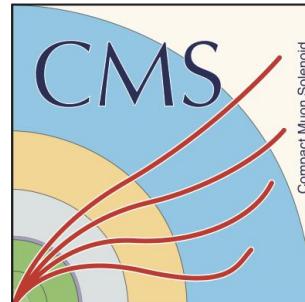




# Rishabh Uniyal

*Ph.D. Candidate, Catholic University of America, and I like data visualization.*

**My research:** *I am working on the search for Dark Matter in the leptonic monoton channel.*



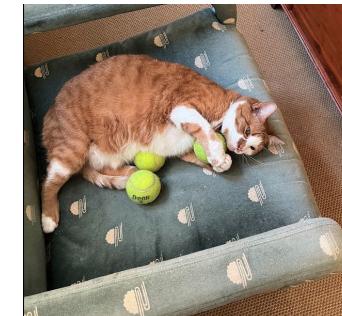
My expertise is:

A software and computing problem I'm grappling with: **Forecasting future energy needs and inclusion of renewable energy.**

I've got my eyes on: **Graduation (for now)**

I want to know more about: **Parallel programming and GNNs**

House cat Garfield

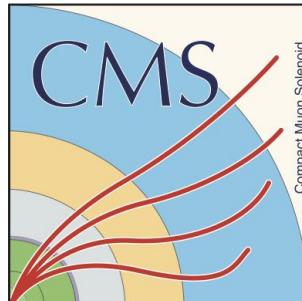




Nikhilesh  
Venkatasubramanian

*Recent grad from UW-Madison  
Incoming Physics Ph.D. student  
at Brown*

**My research:** CMS experiment,  
ML and computation



**My expertise is:** Python, LabVIEW, some experience with AI/ML and simulation softwares

**A software and computing problem I'm grappling with:** Using ML to improve simulation softwares for future colliders

**I've got my eyes on:** Starting my Ph.D. program

**I want to know more about:** Novel ML techniques, GNNs, data visualization in HEP



BROWN



Chami  
Amarasinghe  
amarascscs@umich.edu

*Physics PhD candidate, University of Michigan.* 🎵 Live music 🎵

**My research:** *Dark matter searches with the LZ experiment, xenon microphysics.*



**My expertise is:** Trying to condense liquid xenon

**A software and computing problem I'm grappling with:** How to establish workflow on individual projects + team projects.

**I've got my eyes on:** Multi-target global analyses for dark matter experiments.

**I want to know more about:** Statistics, ML, statistical analyses using ML, GPUs, parallel code.





# Evangelos Kourlitis

*Postdoctoral Appointee  
Argonne National Laboratory*

**My research:** *simulation software,  
machine learning, new physics searches*



**My expertise is:** simulation software optimizations, HEP data analysis/ML

**A software and computing problem I'm grappling with:** developing machine learning solutions to accelerate Geant4 detector simulations

**I've got my eyes on:** differentiable programming, distributed & HPC computing, hardware acceleration

**I want to know more about:** data analysis in advanced computing facilities





# Kezhu Guo

*Incoming Physics PhD student,  
Northwestern University*

**My research:** CMS



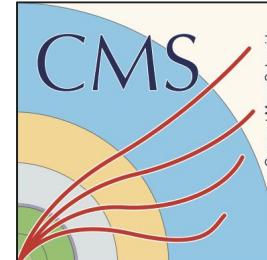
**Northwestern  
University**

**My expertise is:** python, Java, C++ (not really)

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

**I've got my eyes on:** Completing my first project

**I want to know more about:** Deep learning, parallel programming



Reserved for some other logo, a photo of your dog, whatever



# Abinash Pun

*Post Doc, New Mexico State University*

**My research:** Sea Quark's contribution towards the total spin of proton

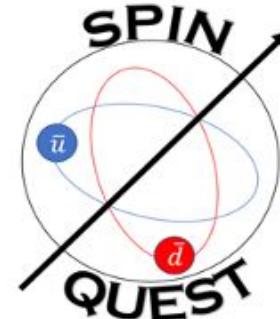


**My expertise is:** Root- C++

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

**I've got my eyes on:** developing efficient analysis framework for the spinquest experiment

**I want to know more about:** new methods (python, ML, AI...) in computing





# Glenn Richardson

*Physics PhD student (Yale University)  
nEXO experiment  
glenn.richardson@yale.edu*

**My research:** *nuclear physics  
(neutrinoless double beta decay)*

**My expertise is:** Charge simulation and analysis in liquid xenon TPCs

**A software and computing problem I'm grappling with:** The most accurate algorithm for counting charges collected on a detector given a random set of parameters e.g: number of signal channels, noise profile, signal time etc.

**I've got my eyes on:** Developing computational techniques for use in rare event detectors

**I want to know more about:** Machine learning - Would like to make progress on developing a machine learning algorithm for use in nEXO's charge reconstruction

**Yale nEXO**

*My recent trip to Guatemala*





# Silas Grossberndt

*3rd year PhD student at the Graduate Center of City University of New York,  
Brookhaven National Labs*

**My research:** *experimental studies of the Quark-Gluon plasma, hadronic calorimeter Monitoring and triggering. ML and AI applications to non-perturbative QCD*

THE  
GRADUATE  
CENTER  
CITY UNIVERSITY  
OF NEW YORK



**My expertise is:** In HEP context, C+, Root mainly with experience in python for AI development. Additional experience with VHDL, c# and VBA

**A software and computing problem I'm grappling with:** How to best implement perturbative expansion of Feynman diagrams in python, both visually and in a Constrained solving problem for the Integration

**I've got my eyes on:** building an AI system to perform higher order Operator Product Expansion to get better jet backgrounds

**I want to know more about:** How to best merge ML/AI techniques with HEP and properly using multithreading



# Zhongtian Dong

*PhD student at the University of  
Kansas*

**My research:** Collider  
phenomenology, BSM physics

**My expertise is:** Python, Machine learning,  
Minimization problems

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

**I've got my eyes on:** Future colliders, Higgs  
precision measurements

**I want to know more about:** Parallel computing





# Yiheng Ye

*Physics Undergraduate  
University of Chicago  
HEP-PH*

**My research:** *Physics Beyond SM;  
Electroweak Precision Program;  
Higgs Physics*

**My expertise is:** Python/C/loop-calculations

**A software and computing problem I'm grappling with:** I'm in general a bad programmer

**I've got my eyes on:** HL-LHC and future collider electronics and software R&D

**I want to know more about:** Machine learning, parallel computing, etc.





# Adam Kobert

*Ph.D. Student at Rutgers University*

**My research:** *High Energy Physics research using experimental data from the CMS experiment at the LHC*

**My expertise is:** Using Python/C++/Root/RDF for the purpose of High Energy Physics Data Analysis

**A software and computing problem I'm grappling with:** Getting the CMS Combine Program to do what I want

**I've got my eyes on:** Getting my analysis to function correctly, then publishing my results.

**I want to know more about:** Machine Learning

My dog Archie





# Hassane Hamdaoui

*Postdoc, Stony Brook Uni, Neutrinos Physics IceCube.*

**My research:** *Neutrino-nucleon interaction cross section measurement using IceCube high energy cascade data.*



Stony Brook  
University



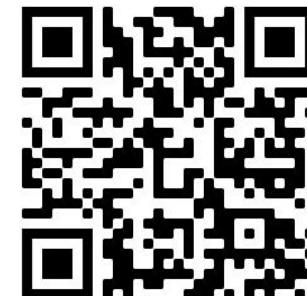
ICECUBE  
NEUTRINO OBSERVATORY

**My expertise is:** HEP data analysis, DOM integration

**A software and computing problem I'm grappling with:** Improve cascade events reconstruction

**I've got my eyes on:** future neutrino and collider experiments.

**I want to know more about:** parallel computing, multithreading and ML





# Stephen Greenberg

*PhD Student  
UC Berkeley, LBNL*

**My research:** Neutrino physics, R&D on noble liquid detectors, charge/light readout electronics



My expertise is: **ML and electronics**

A software and computing problem I'm grappling with: **accelerating analysis software of vectorized data**

I've got my eyes on: **you** 😊

I want to know more about: **GPU and parallel programming**





# Suzanne Rosenzweig

*PhD Student  
University of Florida*

**My research:** Searching for BSM signatures in collision data collected by CMS at the LHC

**My expertise is:** Python, ML, HEP analysis, some C++

**A software and computing problem I'm grappling with:** Developing a NN to separate signal events from background without being able to train with background data

**I've got my eyes on:** Graduating and working in industry where I can apply my technical and/or science communication skills

**I want to know more about:** Various ML methods that may be useful for optimizing my analysis





# Ho-Fung Tsoi

*Physics PhD student  
University of Wisconsin-Madison*

**My research:** *Exotic Higgs searches  
and ML triggers at CMS*



**My expertise is:** BSM physics searches,  
ML applications at trigger and analysis  
levels

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

**I've got my eyes on:** More ML usage in  
HEP experiments

**I want to know more about:** ML and  
computing techniques for HEP





# Benjamin Gilbert

PhD Student,  
Columbia University

**My research:** *Relativistic heavy ions, ultra-peripheral collisions, jet production*



**My expertise is:** C++, ROOT, Python, simulations, jet reconstruction, luminosity measurements

**A software and computing problem I'm grappling with:** Processing large ATLAS event records to filter signal events

**I've got my eyes on:** Machine learning approaches to optimizing detector design

**I want to know more about:** Methods of training machine learning tools, efficient computing for triggering



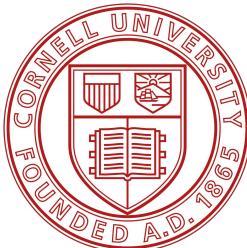


# Gavin Niendorf

*Physics Ph.D Student, Cornell University*

## My research:

- *Track Reconstruction for the HL-LHC.*
- *Previously worked on Stanford's LDMX experiment.*



**My expertise is:** Scientific programming, data science, modeling physical systems

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

**I've got my eyes on:** "Foundation models" and deep learning at scale

**I want to know more about:** High-performance computing, deep learning in HEP experiments

