USCMS Summer Undergrad Internship Program

Welcome!

Tell us about yourself in a slide
(an example slide follows)

"MEET THE INTERNS"

Michael J Miranda

- *CUNY City College of New York*
  - *B.S. in Physics 2020*
- *Currently Working as a High School Physics and Math Teacher*

My research:
- Twistronics of 2D Transition Metal Dichalcogenides (Photonics)
- Data Analysis of Gamma-Ray Spectroscopy (Nuclear Physics)
- Collider Dynamics using S-Matrices and Entanglement (Particle Physics)

What are you really good at?

- Teaching myself new things
- Being self-directed

Something you've had problems with
- Getting to the next level of my education and intended career path
  - Writing statements of purpose

I've got my eyes on:
- Acceptance into grad program for experimental particle physics for Fall 2025 semester
- Learning to use Python for Computational Physics (both this summer and after)

My hobbies are:
Anime, Shogi, Dancing,
(anything) Music

Kirstin Poppen

Gustavus Adolphus College, St. Peter MN 2025

What are you really good at?

- Being organized
- Adapting to new situations

Something you've had problems with

- Figuring out my plans for after undergrad

I've got my eyes on:

- Learning more programming languages (besides just Python)
- Networking and meeting more people in the physics field

My hobbies are:

- Soccer, painting, hiking

Hannah Green

Ohio Wesleyan University, 2024

My research:
- Python simulation and documentation for CMB-S4's DAQ system
- Some unofficial work with using RR Lyraes as standard candles

What are you really good at?

- Learning new things
- Pushing through challenges

Something you've had problems with
- Staying organized throughout the grad school process

I've got my eyes on:

- Applying to grad schools!
- Improving my python skills

My hobbies are:
Gaming, cooking, working out, reading, watching bad sci-fi movies

Jordan Glover

Tougaloo College

My research:
This is my first research opportunity.

What are you really good at?

Managing stressful situations
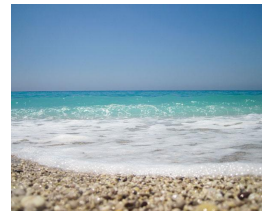Meeting new people
Learning new concepts

Something you've had problems with
Maintaining a healthy diet

I've got my eyes on:
Learning about computer programming

I'm from Monroe, LA. I enjoy swimming, reading, bowling and traveling with friends and family.
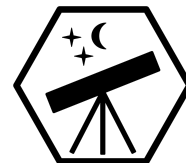
Parveen Narula

Student at Beloit College

Previous research experience:
Clumps in Saturn's F ring

What are you really good at?
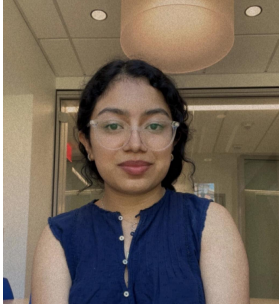
Public Speaking and bouncing back from failure

My career goals:
I want to eventually get a PhD in Astrophysics and become an Astrophysicist

I've got my eyes on:
Increasing how long I run for, finding new recipes to cook, becoming a better coder and becoming a better researcher

Beloit College

THAILAND

Andrea Ola

Physics and Computer Science Double major at Berea College

I enjoy swimming, jogging outdoors, and journaling.
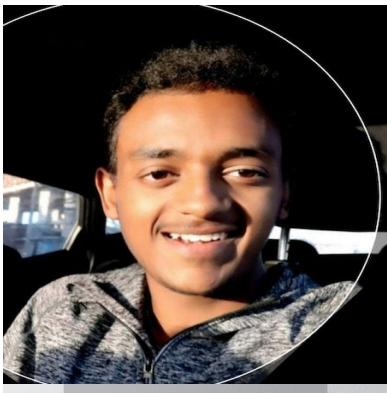
What are you really good at?

Problem-solving, math, and pursuing my goals.

Something you've had problems with
Balancing my mental/physical health and academics.

I've got my eyes on:
Exploring the areas where there is an overlapping between physics and computer science and getting into a Ph.D. program.

Haile Ayalneh

Wabash college, 2026

My research: I have no prior research

What are you really good at?

coding

Something you've had problems with
Time management

I've got my eyes on:
 Doing research on quantum physics
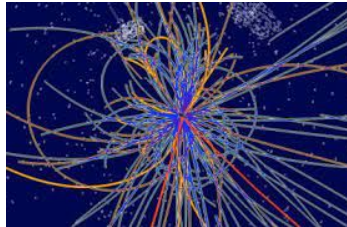
My hobbies are:
Soccer, playing video games

Luan J. Hernández

Bachelor's Student in Physics
University of Puerto Rico - Mayagüez

What are you really good at?
- Collaborating with groups and handling pressure
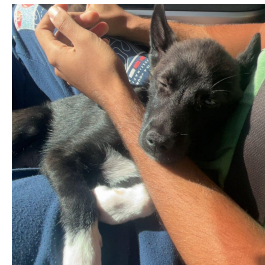
Something you've had problems with?
- I struggle with programming

I've got my eyes on:
- Research opportunities in my university in particle physics
- Applying to grad schools

My hobbies are:
- Hanging out with my pets
- Reading anything related to science

My research:
- First time conducting research

11

Christina Mondelli

Lewis University, Romeoville, Illinois

What are you really good at?

- Being self-motivated and hard-working
- Organizational skills

I've got my eyes on:
- Getting my masters and Ph.D in physics and becoming an astrophysicist

Hobbies:
- Soccer
- Playing the cello
- Surfing

Zehua (Steve) Liang

Student at RIT

My research:
None prior

$$\nabla \cdot \mathbf{E} = \frac{\rho}{\varepsilon_0}$$

$$\nabla \cdot \mathbf{B} = 0$$

$$\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$$

$$\nabla \times \mathbf{B} = \mu_0 \mathbf{j} + \frac{1}{c^2}\frac{\partial \mathbf{E}}{\partial t}$$

What are you really good at?
Time management
People management
Ceramics

Something you've had problems with?

- I had problem with getting a driver's licence

I've got my eyes on:

Learn more on how the world works.

My hobbies are:

Ceramics, Stellaris, Cooking,

13

Felipe De Figueiredo

Institution
Long Island University

What are you really good at?

- Conceptualizing problems and applying their solutions
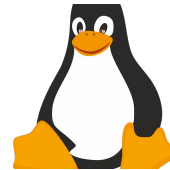
Something you've had problems with
- Deciding on a career choice!

I've got my eyes on:
- Applying for graduate programs for Fall 2024

Hobbies:
- Hiking, gaming, music (Any genre)

Elena Vlaskovic

Edmonds College / Embry Riddle Aeronautical University

My research:
"Data Analysis of Radio Meteor Observations" at Petnica Science Center in Serbia

What are you really good at?

Being proactive and making the most out of opportunities.

Something you've had problems with
Finding research jobs as an international student

I've got my eyes on:
New opportunities to do research in the field of astronomy, engineering, and physics.

My current hobbies are:
Reading fiction novels (mostly sci-fi and fantasy), watching Breaking Bad

Sama Abbadi

Kennesaw State University
- B.S Mechatronics Engineering 2026

What are you really good at?

- Learning new things.
- Being organized.
- Math.

Something you've had problems with
Finding good work opportunities that can give me experience in my field.

I've got my eyes on:
Learning C++
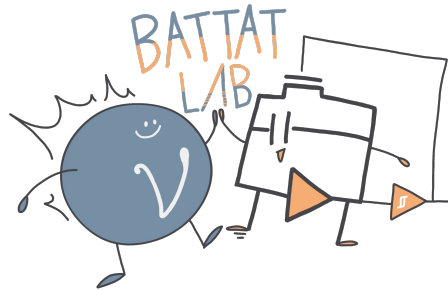
Hobbies:
Soccer, music, and reading.

I-see Warisa **Jaidee**

Wellesley College
Astrophysics

My research: Still learning…
With my professor: Q-Pix collaboration to develop 3D readout system for large-scale neutrino detectors
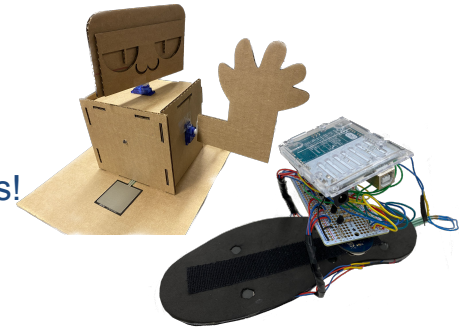
What are you really good at?

Auto CAD design, Drawing

Something you've had problems with:
Recovering from jet lag *-*

I've got my eyes on:
Astroparticle physics

Arduino programming, Robots!

Hobbies:
Drawing! Crocheting! Stargazing! Writing!

WELLESLEY
W

Carlos Romero

Elmhurst University
 - B.S Physics and Mathematics 2023

My research: ML modeling of odor-sensing octobot; Prediction of ink color using quantum computing methods

What are you really good at?

- Mathematics.
- Being self-driven and hardworking.
- Learning things on my own.

Something you've had problems with
Narrowing down my interests among different fields in physics.

I've got my eyes on:
Getting into a top PhD program either on biophysics or condensed matter.

Hobbies:
Football, Anime, Reading, Sci-Fi

Emanuela Riglioni

B.S. Chemistry and Robotics Engineering,
Xavier University of Louisiana 2024

Research:

- Stereolithography of ionic liquids
- IoT-based Remote Monitoring and Computing Systems for production of environmental air quality monitoring system

What are you really good at?

Time management, chemistry

Something you've had problems with:

Applying coding skills outside of the classroom

I've got my eyes on:

Finding the right grad school program that allows me to merge my interests in both chemistry and engineering

Hobbies:

Reading, photography, baking

19

Bongiwe Sandi Nandi Mkwananzi
~Bo-ngee-whe

Bethune-Cookman University, 2026

BS Computer Science

Research:

-No prior research experience.

What are you really good at?

I'm good with numbers and I grasp concepts fast.

Something you've had problems with:

Taking things easy, I'm always busy.

I've got my eyes on:

Widening my scope on Physics, coding and Data Analysis.

My hobbies are:

Dancing, Sketching/painting, Hair braiding.

Brendan Ricketts

Tuskegee University 2026
Aerospace Engineering Major

My research: I haven't done any research yet. Next semester I will start doing research with the head of the Aerospace engineering department at my school.

What are you really good at?

- I'm good at math and problem solving.

Something you've had problems with

- I need to work on my organization skills.

I've got my eyes on:

- Getting my Engineering degree.

My hobbies are:

- Basketball and video games

Gabriel J Soto

B.S. Physics CSU Fresno
PhD UC Davis (starting)
Research: I've interned with
Fermilab a few other times. I've
mostly stuck with neutrino stuff
and reconstruction as well.

What are you really good at?
Solving problems.
Something you've had problems with?
Negotiations.
I've got my eyes on.
Doing my PhD in accelerator physics.
Hobbies:
Play the guitar, go hiking, exercise, hangout with
friends, and go on night walks.

Trong Le

What are you really good at?

- Physics

I've got my eyes on:
- Getting a job or a PhD after graduation

Hobbies:
- Watching YouTube
- Used to play Genshin Impact

**Middlebury College
Middlebury, VT**

"MEET THE MENTORS"

Guillermo Fidalgo Rodríguez

Master's Student in Physics
University of Puerto Rico - Mayagüez
gfidalgo@cern.ch

My research:
Analysis on Exotic Physics: Emerging Jets.
I do Machine Learning for DQM Studies for the CMS Tracker.

My expertise is:
Using python for ML Studies

A problem I'm grappling with:
Designing a new HLT Trigger for my analysis

I've got my eyes on:
A Framework laptop for replacing my old pc.

I want to know more about:
C++, Arduino
How to efficiently teach a dog new tricks
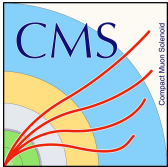
Bruno Coimbra

Computer Science
Fermilab
coimbra@fnal.gov

My research:
I work on distributed computing systems.
Currently, I'm a software developer for the GlideinWMS and HEPCloud projects.

I'm interested in:
Software Engineering, Distributed Computing, Artificial Intelligence, Machine Learning

I've got my eyes on:

Development containers that can be shared with my fellow developers.

My hobbies are:
Gaming, Biking, Snowboarding

🎗 Fermilab

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
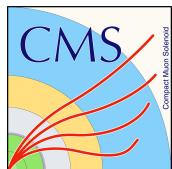
My expertise is:
Still learning 🤣

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

Tulika Bose

Professor of Physics
University of Wisconsin-Madison
Deputy Program Manager USCMS Software &
Computing
tulika@hep.wisc.edu

My research:
Standard Model measurements, searches for Beyond the Standard Model particles at the CMS Experiment
Trigger and data-acquisition, Software & Computing
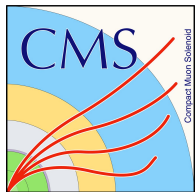
I enjoy:
Working on challenging tasks in a collaborative setting

Beyond research, I am particularly interested in:
Outreach, science communication and improving diversity and inclusion

I've got my eyes on:
Learning to cook gourmet meals and play the piano
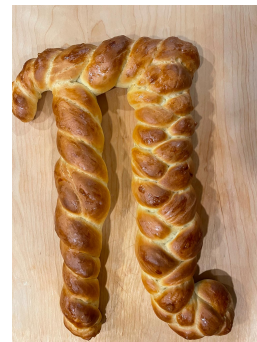
Matt Bellis

Associate Professor of Physics
Siena College, Loudonville, NY
mbellis@siena.edu

My CMS work:
Top quark, Data Preservation and Open Access, Dark Matter

My expertise is:
Programming, data science, teaching

A problem I'm grappling with:
Trying to access the data I want. Finding time to go for a bike ride.

I've got my eyes on:
Learning how to teach better

Hobbies and interests:
Spending time with wife and son, guitar, biking, YouTube

Julie Hogan

Associate Professor of Physics
Bethel University, St. Paul MN
j-hogan@bethel.edu

My CMS work:
Vector-like quark searches, Data Preservation & Open Access, fun/silly educational activities like LEGO tutorials!

My expertise is:
Teaching Physics 1! And programming

A problem I'm grappling with:
Building out a new physics analysis in up-to-date software instead of old software

I've got my eyes on:
Learning to program better with dataframes and workflow software

Hobbies and interests:
Hanging out with my baby!
Sewing/quilting, singing,
playing handbells.
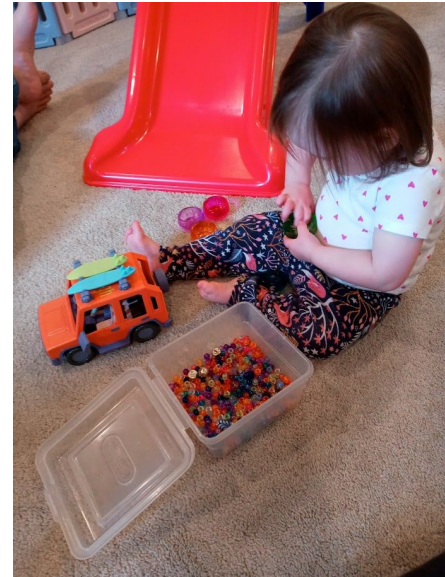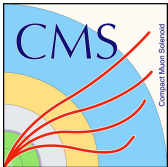
Marco Mambelli

Computer Engineering
Fermilab
marcom@fnal.gov

My research:
I work on distributed computing system.
In particular the GlideinWMS and HEPCloud projects that are used to run all analyses and simulations for CMS, and most Fermilab experiments.

I like the everyday challenges in my job:
System integration, Software engineering, Coding especially in Python and shell, Troubleshooting and optimizing complex systems

I enjoy also:
Teaching, Cooking, Photography, Biking, Dancing

🟦 Fermilab

Patrick Gartung

Senior Developer
Fermilab
gartung@fnal.gov

My work:
Code modernization of offline software for the CMS experiment and building software with Spack for Fermilab hosted experiments

I enjoy the challenges of my work:

System integration. Software engineering. Coding in C++, Python and shell. Troubleshooting and optimizing complex software.

In my free time I enjoy:

Reading, online gaming, watching movies, home improvement projects

Marguerite Tonjes

University of Illinois, Chicago
LPC Computing Support

Previous research: Analysis of high-energy heavy-ion collisions at the Relativistic Heavy Ion Collider, and then in CMS at the LHC.
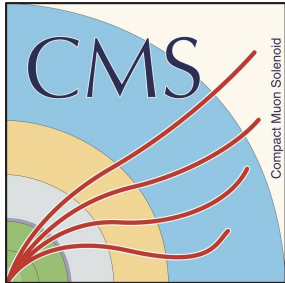
What are you really good at?

Fixing things, debugging, spotting problems before they start, collaborating, documentation. I enjoy the problem solving that comes with physics & computing and the reward of helping my colleagues.

Something you've had problems with:
I almost failed first year Physics in college, but managed a turn-around by working with others in the Society of Physics Students and worked my way to a PhD in Nuclear Physics

In my free time I enjoy:
Photography, making jewelry, hiking, yoga, rollerskating, baking, playing games, reading, ...
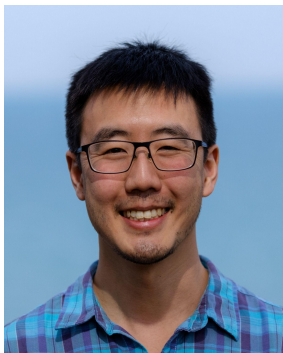
David Yu

Univ. of Nebraska Lincoln
LPC Operations Support
Research: Remote operations from FNAL; searches for dark matter, Higgs, and new dijet resonances (i.e. new particles decaying to two quarks or gluons); deputy project manager of CMS hadron calorimeter
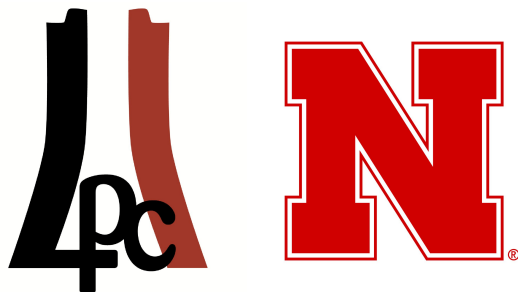
Things I enjoy

(Re)interpreting CMS results for dark matter; scientific python; teaching younger collaborators
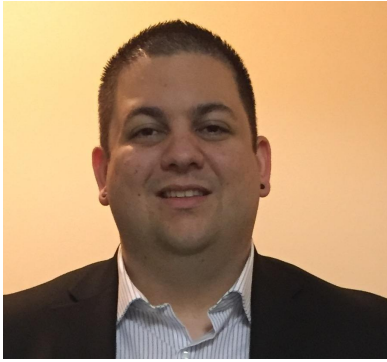
Something you've had problems with:

Starting too many projects at once

I've got my eyes on:

The next collider for HEP (a muon collider?)

Hobbies:

Running, cycling, photography, my cats

Daniel Diaz

Postdoctoral Scholar
LPC Distinguished Researcher
University of California San Diego
d4diaz@ucsd.edu

My research:
Searches for long-lived particles, studies of the Higgs self coupling, fast machine learning, the CMS Level-1 trigger.

What are you really good at?

Baking?

Something you've had problems with:
Asking for help.

I've got my eyes on:
computer screen, usually

Hobbies:
Foreign languages, coffee, travel

UCSD   CMS   4pc   Fermilab   a3d3 Accelerated AI Algorithms for Data-Driven Discovery
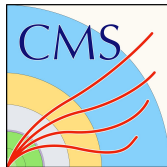
Javier Duarte

Assistant Professor
University of California San Diego
jduarte@ucsd.edu

My research:
Machine learning for particle physics,
High-energy Higgs boson production, fast
machine learning on field-programmable gate
arrays (FPGAs).
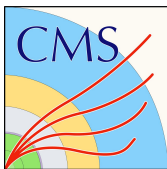
What are you really good at?

Collaborating

Something you've had problems with:
Saying no to things

I've got my eyes on:
My email inbox / Slack

Hobbies:
Running, soccer, walking our dogs

Ana Maria de Sousa Slivar

PhD student at the University of Alabama
My research: I work with end-to-end machine learning algorithms for data analysis at the CMS experiment

I enjoy working in a collaboration! Physics is better when you have the space to ask questions :)

Something you've had problems with:
Getting started at a new computing cluster and passing my qualifying exams

My hobbies are:
Painting, playing Stardew Valley, and watching Bama football
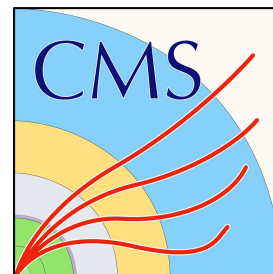
Shivani Lomte

Physics PhD student at University of Wisconsin-Madison
lomte@wisc.edu

My research:
Dark matter search at CMS experiment,
Beam background studies at Muon Collider

I enjoy

learning new skills
reading nonfiction, biking, photography

I'm working on
Asking for help when stuck

I've got my eyes on:
Moving to CERN this summer
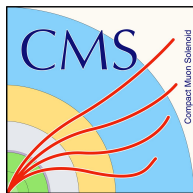
Andre Frankenthal

Postdoc
Princeton University
andresf@princeton.edu

My CMS work:
Searches for dark matter with long-lived particles
Searches for rare phenomena with dedicated datasets
Tracker upgrade
Muon physics calibration
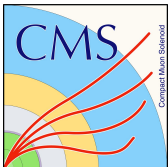
I enjoy:
Problem-solving, coding, skiing, soccer

A problem I'm grappling with:
Never enough time to read interesting papers!

I've got my eyes on:
Learning about geometric neural networks

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

PRINCETON UNIVERSITY

Cristina Mantilla Suarez

Postdoctoral researcher
Fermilab
cmantill@fnal.gov

My research:
- Characterizing the Higgs boson at high momenta
- Front-end electronics for the endcap calorimeter upgrade

I enjoy:

Learning from data and thinking of new ways to analyze data

My hobbies:
Yoga, Walking with my dog, Reading

I've got my eyes on:
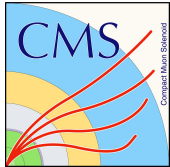
Darin Acosta

Professor, Department of Physics and Astronomy

Rice University
dea6@rice.edu

My research:
Rare Higgs boson decays
Searches for Beyond Standard Model physics
Trigger systems and electronics
New collider ideas

What are you really good at?
Problem solving, teaching, management (I hope!)

Something you've had problems with
Encouraging more students to attend class

I've got my eyes on:
TeV scale muon and muon-ion colliders

Things I enjoy:
Running, photography, digitizing old family photos and videos

Jennet Dickinson

Postdoctoral researcher, Fermilab
jennetd@fnal.gov

My research:
- High energy Higgs boson production
- Upgrade of the CMS Outer Tracker
- Futuristic pixel detector design
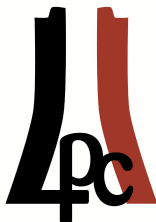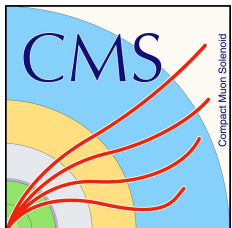
I enjoy: Learning new things

I've got my eyes on: Detectors for next generation collider experiments

My hobbies: Crochet, cartoons, working in my garden

Something you've had problems with: yeah… this isn't going to fit within the one slide limit

Bo Jayatilaka

Scientist, Fermilab
Co-Coordinator, LHC Physics Center
Deputy Division Director, Scientific Computing
Systems and Services at Fermilab
boj@fnal.gov
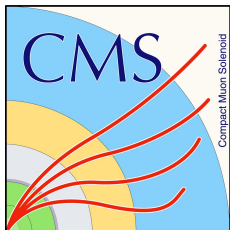
My research/responsibilities:
- Searches for Dark Matter in CMS data
- Preparing CMS computing for exabytes of data in the HL-LHC
- Helping to manage scientific computing infrastructure at Fermilab

I enjoy:

Solving puzzles (dark matter is very much a puzzle), the challenges of large-scale computing, and working in a large, diverse collaboration

My hobbies:

Playing with my kid and my cat (not always at the same time), video games, reading

I've got my eyes on:

How AI will transform science, when transistors will truly reach a quantum limit, a future where I get more sleep
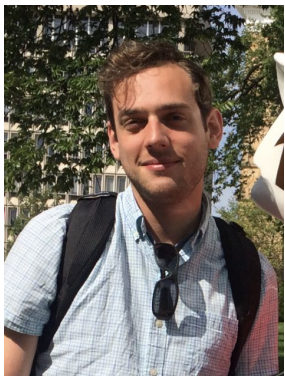
Nick Smith

Research Associate, Fermilab
CMS Higgs Combination L3
nick.smith@cern.ch ncsmith@fnal.gov
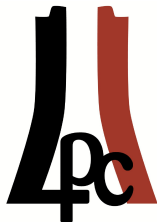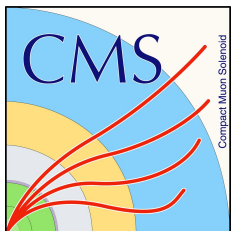
My research/responsibilities:
- Characterizing the nature of the Higgs boson
- Searching indirectly for new physics via Effective Field Theory approaches
- Building the software tools to make HEP analysis happen in an easy-to-use, scalable, and efficient manner

I enjoy:

Statistics, cool algorithms

My hobbies:

Biking, piano, Tears of the Kingdom (of late)

I've got my eyes on:

jax, ceph, manifold optimization, my cat

@monalisatatertot

Abdollah Mohammadi

*Teaching Faculty and Research scientist,
University of Wisconsin-Madison
Abdollah@hep.wisc.edu*

My research/responsibilities:
- Search for Standard Model and Beyond Standard Model Higgs bosons and in general new Physics
- CMS convener of the BSM Higgs in LHC Higgs WG
- Involvement in CMS L1 operation and development
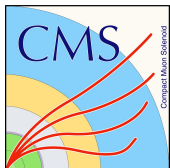- Background studies for the new future colliders: e+e- and muon colliders

I enjoy:

- Skiing in winter (WI is not the best place to ski :) and swimming in summer (WI is a great place :)

My hobbies:

Reading and writing short stories. Biking
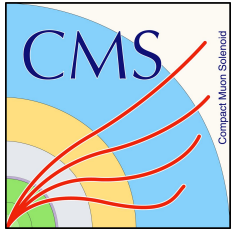
I've got my eyes on:

Decision for the new HEP collider.
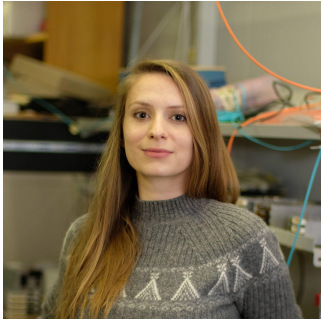
Grace Cummings

Lederman Fellow (post-doctoral researcher)
Fermi National Accelerator Laboratory
gcumming@fnal.gov

My research/responsibilities:
- Searches for new physics with unconventional signatures
- Readout electronics characterization for the CMS High Granularity Calorimeter Upgrade
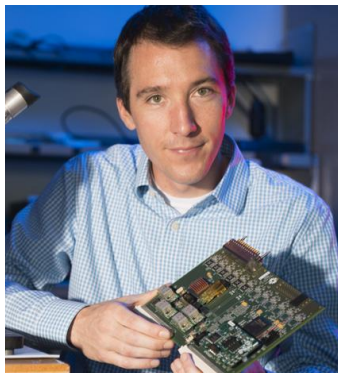- Future collider calorimetry

I enjoy:

- Building stuff
- Using physics-driven observables in analyses

My hobbies:

- Drawing, painting, tennis, and recently climbing

I've got my eyes on: Detector technologies for future colliders!
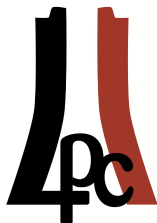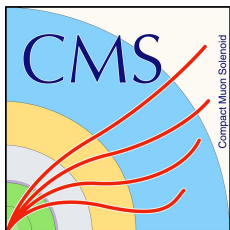
Jim Hirschauer

Scientist, Fermilab
Deputy Head of the Microelectronics Division
jhirsch@fnal.gov

My research/responsibilities:
- Beyond the Standard Model Physics
- Calorimetry

My hobbies:
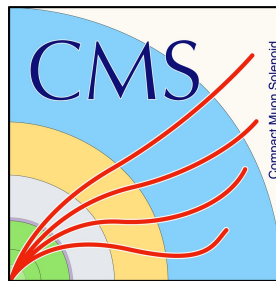
- Running

Hans Wenzel

Physics Application Developer
Fermi National Accelerator Laboratory
wenzel@fnal.gov

My research/responsibilities:

- GEANT4 Research and development
- Simulation acceleration with GPUs
- Calorimetry

춘 Fermilab

My CMS work:
- **Higgs boson observations**
  - **Di-photon Run 1**
  - **W/Z + Hbb Run 2**
- **Precision luminosity**
- **Timing detector (MTD) upgrade**
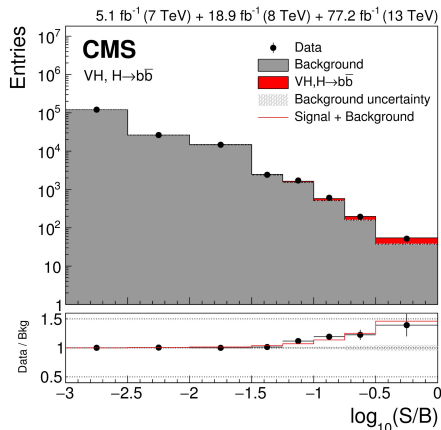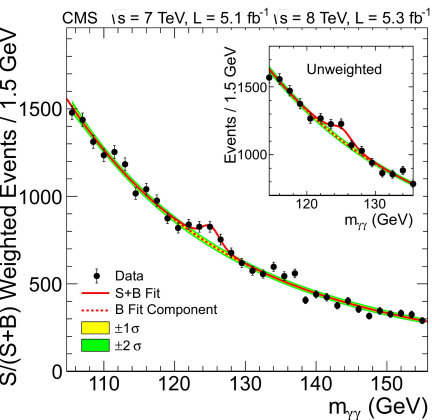
A problem I'm grappling with:
Imposter syndrome

I've got my eyes on:
Improving graduate student experiences

I want to know more about:
What are my machine learning outputs "thinking"?

Chris Palmer
Assistant Professor
University of Maryland, College Park
capalmer@umd.edu

Michael Krohn

University of Minnesota
*Postdoctoral researcher*
krohn045@umn.edu

My research:
- Search for beyond the Standard Model physics, mainly heavy neutrinos
- Upgrade of the CMS High Granularity Endcap Calorimeter
- HCAL trigger operations
- Monte Carlo generation and production

I enjoy:

- Searching for new particles in new and unique ways
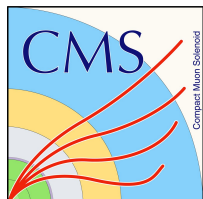
My hobbies:

- Powerlifting, rock climbing, and reading fantasy series
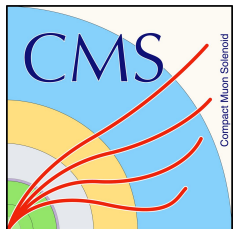
Kiley Kennedy

Dicke Fellow / Postdoc
Princeton University
kileykennedy@princeton.edu

My research:
- Searches for long-lived particles with dedicated triggers
- Searching for anomalous events with machine learning
- HL-LHC Upgrade of the Outer Tracker

I enjoy:
- Solving problems
- Thinking about new ways to exploit detector capabilities
- Hiking, traveling, snowboarding, cooking

I want to learn more about:
- Graph neural networks
- Faster analysis workflows/machinery (e.g. coffea, work queue)

I've got my eyes on:
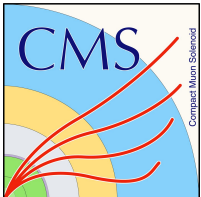Expanding/rethinking HEP advocacy

51

Nick Pervan

Graduate Student
Brown University
nikolas_pervan@brown.edu

My research:
- Search for 4 top quark production
- Tracker data quality monitoring machine learning playground

I've got my eyes on:
- Advanced ML techniques (graph neural networks)
- Traveling to CERN this coming semester

Charis Kleio Koraka

Postdoctoral researcher
University of Wisconsin-Madison
charis.kleio.koraka@cern.ch

My research:
- Precision measurement of the top Yukawa coupling
- Search for beyond the SM signatures such as Vector-Like Leptons
- Optimizing the CMS electron and photon reconstruction software by making use of GPUs

I enjoy:

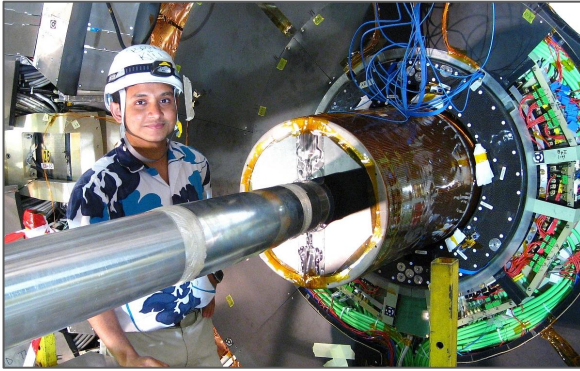Solving complex problems, optimizing my solutions, learning new skills and collaborating!

My hobbies:

Travelling, hiking, skiing, dancing and solving puzzles. Volunteering at cat rescue

I've got my eyes on:
- Making more use of GPUs for CMS software in Run-3 and HL-LHC.
- Finding hints for new physics :D

Souvik Das

Staff Physicist, Faculty in Mechanical and Industrial Engineering
Purdue University
souvik@purdue.edu

Current Research
- Designing CMS Phase II Structural and Thermal Materials
- CMS Phase II Inner Tracker Assembly
- Measurement of Higgs self-coupling
- Quantum Computing algorithms for High Energy Physics
- Artificial Intelligence with Spiking Neural Networks
- Microchannel Cooling for high performance chips

I enjoy:

Understanding how the world works, how I work, and the relationship between the two.

My hobbies:

Thai kickboxing, swimming, windsurfing, badminton, ceramics, woodworking, gardening

I've got my eyes on:

- Artificial General Intelligence
- The next core breakthrough in quantum computing algorithms
- Exploiting quantum mechanics for interaction-free measurements

54