



Michael Andrews

*Physics PhD Student, Carnegie Mellon University
Member, CMS Experiment*

My research:

Currently focused on building image-based deep learning classifiers for physics event and object classification.



My expertise is:

Familiar with image-based ML classification.

A problem I'm grappling with:

Using detector-level data for image-based deep learning for physics event classification and particle identification.

I've got my eyes on:

HPC computing applications for ML in HEP.
Other applications of ML in HEP.

I want to know more about:

Machine Learning on Sparse data, Distributed and HPC applications in ML.



Adam Aurisano

Post-doctoral fellow
University of Cincinnati
MINOS+ physics coordinator and sterile neutrino
convener
NOvA detector simulations convener
aurisaam@ucmail.uc.edu

My research:

Measuring neutrino oscillation parameter and searching for sterile neutrinos using data collected by the MINOS/MINOS+ and NOvA experiments. Developing deep-learning based neutrino interaction classifiers.



My expertise is:

Neutrino physics, sterile neutrinos, detector simulations, and convolutional neural networks.

A problem I'm grappling with:

Separating cosmic ray backgrounds from neutral current signal and separating tau neutrino and neutral current interactions.

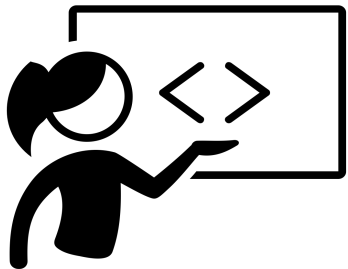
I've got my eyes on:

Semantic segmentation.

I want to know more about:

Novel network architectures to improve classification or reconstruction.





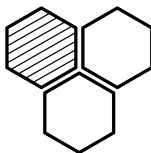
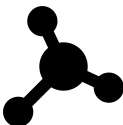
Lothar Bauerdick

Senior Scientist at Fermi National Accelerator Lab

bauerdick@fnal.gov

My research:

CMS Experiment at the LHC at CERN
Involved in experiment operations including the
US contributions to CMS software and computing



My expertise is:

Expert in nothing, but familiar with HEP software, workflows, data management, aspects of distributed high throughput computing

A problem I'm grappling with:

LHC computing needs to scale by x100 to the high-luminosity LHC upgrade.

I've got my eyes on:

Functional Programming, from languages to category theory

I want to know more about:

How to incorporate new ideas, approaches and progress in computer science: HEP is working in a rather closed “C++-based” data processing ecosystem — how disruptive do we need to be to make real progress?



Matt Bellis

*Assistant professor
Siena College, Dept. of Physics and Astronomy
Loudonville, NY
(joined CMS through Cornell collaboration)*
mbellis@siena.edu [@matt_bellis](https://twitter.com/matt_bellis) (Twitter)
[Github repos](#)

My research:

Rare and forbidden top-quark decays (CMS)
Dark matter direct detection (CoGeNT)
Cosmological calculations relevant to large-scale structure



p^3 Particle Physics Playground

My expertise is:

HEP analysis. Computational challenges.
Outreach and education.

A problem I'm grappling with:

How can I engage my students in HEP analysis while exposing them to computing tools that are used by the broader CS community?

I've got my eyes on:

ROOT-alternatives. GPUs and other multicore architectures. HDF5.

I want to know more about:

New software and hardware that is coming down the line or in use by non-HEP communities.





Doug Benjamin

Research Scientist , Duke University

Douglas.Benjamin@duke.edu, dbenjamin@anl.gov

My research:

High Energy Physics (HEP) with an emphasis on distributed computing data analysis for collider particle physics and computational cosmology.

My expertise is:

Distributed data analysis for HEP. Supporting the varied Scientific users. Finding weakness in distributed computing systems.

A problem I'm grappling with:

Providing sufficient computing to meet the needs of the HL-LHC using HPC centers. Working with physics analyzers to make use of HPC in novel ways.

I've got my eyes on:

Machine learning for data analysis. Advances in data analysis in other big data fields.

I want to know more about:

How other scientific communities are solving their Big Data challenges. Exascale computing.



Karan Bhatia

Scientific Computing, Google Cloud Platform

karanbhatia@google.com

@sdksb (twitter)

My research:

Cloud Computing



Google Cloud Platform



My expertise is:

Cloud Computing (also grid computing, distributed systems, HPC)

A problem I'm grappling with:

How to best partner with the academic and research communities to enable science on Google infrastructure

I've got my eyes on:

Machine Learning

I want to know more about:

Large scale compute challenges



Anton Burtsev

Assistant Adjunct Professor, [Department of Computer Science](#), [University of California Irvine](#)
aburtsev@uci.edu

My research:

I design, and build novel operating systems. My work spans a broad variety of topics from novel datacenters to clean-slate secure and formally verified kernels.



My expertise is:

Operating systems, novel execution runtimes, software-hardware interface, low-latency networks and storage, isolation and security, access control, programming languages

A problem I'm grappling with:

Building a datacenter with the top-to-bottom support for heterogeneous, and, specifically, programmable (aka FPGA) hardware

I've got my eyes on:

FPGA, non-uniform memory, OS architecture

I want to know more about:

Example HEP workloads that need speed and security



Paolo Calafiura

*I am a scientist in the Computational Research
Department at Berkeley Lab.*

My research:

Software Engineering
Heterogeneous Computing
Pattern Recognition

My expertise is:

HEP Application Frameworks, Data Models,
Parallel Computing

A problem I'm grappling with:

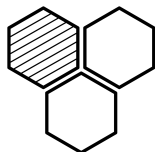
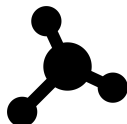
How to run HL-LHC pattern recognition ten
times faster, and on 10 times more cores

I've got my eyes on:

Neuromorphic Computing

I want to know more about:

Algorithms for parallel tracking,
Millions of other things...





Jeff Carver

*Associate Professor
Computer Science
University of Alabama*
carver@cs.ua.edu
<http://carver.cs.ua.edu>

My research:

Empirical Software Engineering, Human Factors in Software Engineering, Software Engineering for Science, Software Quality

My expertise is:

Software Engineering
Human Factors / Empirical Studies

A problem I'm grappling with:

How to best use software engineering principles to develop scientific/research software

I've got my eyes on:

Working with scientific/research developers to understand and address their specific problems

I want to know more about:

What bottlenecks HEP developers face when writing software



Sunita Chandrasekaran

*Assistant Professor, Department of Computer &
Information Sciences, University of Delaware, DE
430 Smith Hall, 302-831-2714*

schandra@udel.edu

*Adjunct Prof. Dept. of Computer Science
University of Houston, TX*

My research:

Focuses on creating language extensions for on-node programming models; Explore parallel algorithms to migrate legacy code to heterogeneous architectures



My expertise is:

Parallel Programming Models, Accelerators, Runtime, Creating parallel benchmark suite, Deep Learning for image classification

A problem I'm grappling with:

Creating language extensions for hierarchical memory systems and novel hardware platforms

I've got my eyes on:

Task based programming model, Adapting Deep Learning for Parallel Computing

I want to know more about:

Programming and software abstraction challenges with High Energy Physics and potential collaborations





Ian Cosden

*Manager, HPC Software Engineering and Performance Tuning
Research Computing, OIT
Princeton University
icosden@princeton.edu*

My research:

HPC software design, performance, and optimization.
Academic software/programming support.

My expertise is:

HPC code optimization and performance tuning.
Parallel Programming.

A problem I'm grappling with:

How to establish a team of Research Software Engineers (RSE) that can contribute to cutting-edge academic researcher in an meaningful and impactful way.

I've got my eyes on:

Existing successful cross-disciplinary software collaborations.

I want to know more about:

What software challenges are others facing?
What opportunities exist for RSEs in the current and future research community.





Kyle Cranmer

Professor of Physics (and Data Science) NYU
Co-PI for DIANA-HEP, Senior Personnel DASPOS
Moore-Sloan Data Science Environment @ NYU
Advisory Board for INSPIRE & HepData
kyle.cranmer@nyu.edu [@kylecranmer](https://twitter.com/kylecranmer)
<http://theoryandpractice.org>

My research:
physics-aware data science



RooStats
HistFactory

My expertise is:

Particle physics, statistics, machine learning,
reproducibility, reinterpretation

A problem I'm grappling with:

Approaches to statistical inference that natively
integrate Monte Carlo simulation and machine
learning

I've got my eyes on:

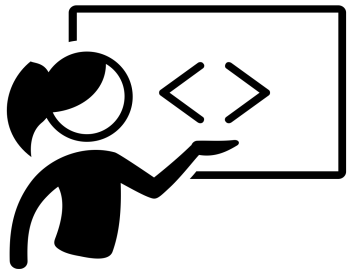
You :-)

I want to know more about:

What works



CERN
Analysis Preservation



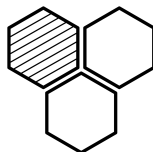
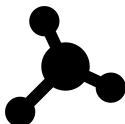
Kaushik
De

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My research:

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My expertise is:

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A problem I’m grappling with:

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I’ve got my eyes on:

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I want to know more about:

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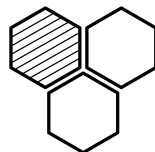
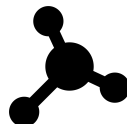


Patrick de Perio

*Postdoc
Physics
Columbia University
XENON100 analysis coordinator
XENON1T MC/simulations coordinator
pdeperio@astro.columbia.edu*

My research:

Dark matter direct detection (XENON)
Neutrino interactions and oscillation (T2K, Super-K)



My expertise is:

Data analysis, model building, statistical inference

A problem I'm grappling with:

Massive Monte Carlo simulations and integration into statistical inference

I've got my eyes on:

New methods to ease students into massive analysis

I want to know more about:

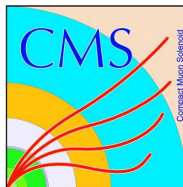


Peter Elmer

*Staff Researcher, Princeton University
CERN CMS Experiment Software&Computing R&D
Coordinator
U.S. CMS Ops Program Software&Support L2 Manager
Lead PI for DIANA-HEP and S2I2-HEP Projects
Peter.Elmer@cern.ch*

My research:

The CMS Experiment at CERN. I work on building the software and computing systems needed to operate and produce scientific results from the experiment.



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 in our organizations and finding ways to create a more dynamic and sustainable long term structure to address our challenges.

I've got my eyes on:

All of you (and your ideas and experience)

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.





Matthew Feickert

High Energy Physics Ph.D. Candidate
Southern Methodist University

matthew.feickert@cern.ch or mfeickert@smu.edu

GitHub: [matthewfeickert](https://github.com/matthewfeickert) [@HEPfeickert](https://twitter.com/HEPfeickert)

My research:

- Upgrades to the b-jet trigger slice of the ATLAS trigger
- Higgs decays to heavy flavour fermions ($H \rightarrow b\bar{b}$, $H \rightarrow c\bar{c}$)
- di-Higgs production at the LHC



SMU®



My expertise is:

High energy physics data analysis, building analysis software applications

A problem I'm grappling with:

How to use data flow graphs to improve performance of analysis software

I've got my eyes on:

Applications of machine learning in high energy physics; Reproducible data analysis and analysis workflows

I want to know more about:

Applications of high performance computing and machine learning in high energy physics

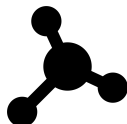


Larry Frank

*Professor and Director, Center for Scientific
Computation in Imaging (<http://csci.ucsd.edu>)
UC San Diego
lfrank@ucsd.edu*

My research:

Magnetic resonance imaging research, neuroimaging, quantitative analysis of spatio-temporal imaging data, including functional MRI and mobile Doppler radar data of severe weather.



My expertise is:

MRI physics, neuroimaging with MRI, volumetric data analysis. (I have no expertise in HEP!)

A problem I'm grappling with:

Integrating sophisticated data analysis software into a user friendly application for non-technical users

I've got my eyes on:

Machine learning.

I want to know more about:

What data analysis problems HEP people have to deal with...





Meghan Frate

*PhD Student, University of California at Irvine
mfrate@uci.edu*

My research:

Until recently, I worked on the exotic dijet mass search on ATLAS. I'm now looking into using Gaussian Processes in place of functional forms as a way to get data driven background estimates for many resonant searches.

My expertise is:

Jets, data analysis, exotics searches

A problem I'm grappling with:

Including physical/detector information into a Gaussian Process, use a Gaussian Process to do a generic signal search

I've got my eyes on:

Software development and Machine Learning techniques for HEP

I want to know more about:

Software development tools, anything with Machine Learning





Rob Gardner

@rwg 

*Senior Scientist, Enrico Fermi Institute
Senior Fellow, Computation Institute
The University of Chicago
rwg@uchicago.edu*

My research:

Accelerating science through distributed high throughput computation. Leading OSG [User Support](#) and Campus Grids, US ATLAS Distributed Facility Integration program (Tier2 centers). ATLAS federated data access & caching with [Xrootd](#). [Data and Software Preservation](#) and automating virtual cluster creation collaborative science.



My expertise is:

Data-intensive, distributed high throughput computation

A problem I'm grappling with:

Helping Xenon1T and SPT-3G utilize tools & methods developed for LHC and OSG.

Managing innovation while running production facilities and large user communities. Helping small campuses leverage cyberinfrastructure.

I've got my eyes on:

Technologies for software preservation, 'data center' virtualization & containerization, automation, content delivery methods as applied to science

I want to know more about:

Methods for sustaining software, and infrastructure over long time periods



Sergei V Gleyzer

Researcher, University of Florida, coordinator of the Inter-experimental Machine Learning (IML) working group. Email: sergei@cern.ch

My research:

My research is at the intersection of particle physics and machine learning. I develop algorithms, software and new applications for LHC data analysis and detector development. I am a member of the CMS experiment.

My expertise is:

Machine learning in HEP, algorithms and data analysis, software development and searches for new physics

A problem I'm grappling with:

How to push current boundaries of performance and build sustainable software

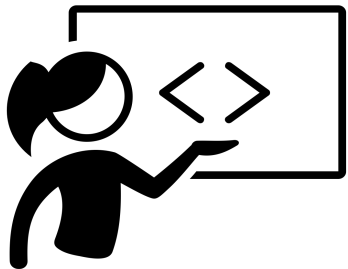
I've got my eyes on:

Everything related to machine learning, HPC

I want to know more about:

New partnerships between HEP and CS, niche ML algorithms that do not yet have applications in particle physics





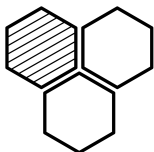
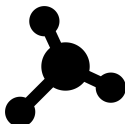
Vinod Gupta

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My research:

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I’ve got my eyes on:

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I want to know more about:

<All text can be replaced, but for consistency we recommend the headings remain.>



Oliver Gutsche

*Scientist (Particle Physics)
Deputy U.S. CMS Software and Computing Program
Manager
Fermi National Accelerator Laboratory
Email: gutsche@fnal.gov*

My research:

After precision measurements of top quark properties with CMS, I am now concentrating (or better my Postdoc(s)) on searches for Dark Matter and SuperSymmetry.

My expertise is:

Operations of large distributed LHC computing infrastructures, Architecture and design of distributed computing solutions, excel spreadsheets

A problem I'm grappling with:

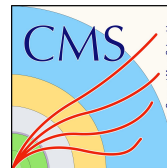
Enabling analysis of exascale datasets by a very large diverse group of researchers

I've got my eyes on:

Industry-based big data technologies and their impact on HEP analysis

I want to know more about:

Machine learning and its applicability to HEP problems, as I never had time to really dive into it.





Lukas Heinrich

My research:

ATLAS BSM Physics Searches. Lead developer of RECAST. Working with analysis teams to capture and define their workflows for use RECAST and large-scale reinterpretation campaigns.

Application of the findings from analysis preservation to projects in Machine Learning.

Trigger Analysis Tools Coordinator in ATLAS

My expertise is:

Triggering Systems, Workflow automation, analysis preservation and reinterpretation. Containers (Orchestration).

A problem I'm grappling with:

How to enable analysis teams to efficiently/easily capture their know-how/code/workflows to maximize the utility of individual analyses

I've got my eyes on:

New analysis models/patterns that go beyond sending batch jobs. Learning from other communities. Declarative Languages.

I want to know more about:

How we can move Machine Learning application further upstream to e.g. simulation.





Mike Hildreth

Mike Hildreth
Professor of Physics
Associate Dean for Research and Graduate Studies
College of Science
University of Notre Dame
hildreth.2@nd.edu

My research:

- CMS Experiment, CERN. Higgs and SUSY physics.
- Focus Area Lead for Application Development, CMS Software & Computing.
- PI of DASPOS (Data and Software Preservation for Open Science)
- PI/Organizer of MPS Workshops on Open Access to Scientific Data

My expertise is:

Physics-related software, software development, Data/Software Preservation

A problem I'm grappling with:

Leading NSF committee on software requirements/development for heterogeneous computing platforms: how do we do this at scale?

I've got my eyes on:

Developments/adaptation of HEP software to new architectures; Tools discussion at RDA

I want to know more about:

Workflow specification/preservation





Robert Illingworth

*Scientific Data Management Group Leader
Fermilab Scientific Computing Division
illingwo@fnal.gov*

My research:

Data management for HEP experiments, especially those outside the LHC

My expertise is:

Data management for HEP

A problem I'm grappling with:

Managing and delivering large scale datasets for experiments which have limited people and specialized knowledge in the subject

I've got my eyes on:

New paradigms in data access for HEP

I want to know more about:

Finding common solutions for these problems



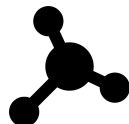
Shantenu Jha

Associate Professor, Computer Engineering.
Rutgers University.

<http://radical.rutgers.edu>

My research:

- Cyberinfrastructure R&D
- High-Performance Distributed Computing
- Computational Science



My expertise is:

- High-performance and distributed systems
- Abstractions and standards based middleware and software systems.

A problem I'm grappling with:

- A systems approach to the design and federation of distributed systems.
- Principles and abstractions for distributed resource management.
- Models of Distributed Systems and Software

I've got my eyes on:

- A Building Blocks Approach to Workflows.



want to know more about:

- Many things..



Chris Jones

*Computer Science Researcher at Fermilab
CMS Core Software Level 2*

My research:

Exploiting multi-core hardware for HEP data processing.

My expertise is:

HEP data processing frameworks

A problem I'm grappling with:

Making CMS software multi-thread efficient, especially when dealing with storage

I've got my eyes on:

Future computing hardware

I want to know more about:

How different members of the community plan to make use of future hardware



Meghan Kane

[@meghafon](https://twitter.com/meghafon) 

Software Engineer @SoundCloud Berlin, Germany
meghan@soundcloud.com
meghaphone.com

MIT 2012, Math & Computer Science
mkane@alum.mit.edu

My research:

Studied: Math & CS (B.S. 2012)

Some graduate work in AI, computability & complexity

Industry: Software development & ML for use in large scale mobile apps, High performance software architecture



Massachusetts
Institute of
Technology

My expertise is:

- Mobile development & machine learning for use in large scale mobile apps
- Software architecture, testing infrastructure, and continuous delivery

A problem I'm grappling with:

- Understanding how the ML landscape has changed since I left academia (2012)
- Uniting my studies in math & ML with my current software engineering job @SoundCloud

I've got my eyes on:

- Practical applications of machine learning
- Programming language design
- GPU programming

I want to know more about:

- Becoming better at designing algorithms for learning from data
- Similarities between ML problems in audio at SoundCloud & ML for particle physics experiments

Peer Lab Berlin



Daniel S. (Dan) Katz

*Assistant Dir. for Scientific Software & Applications, NCSA
Research Associate Professor, ECE
Research Associate Professor, iSchool
University of Illinois, Urbana-Champaign*
d.katz@ieee.org or dskatz@illinois.edu
danielskatz.org @danielskatz

My research:

Developing computational & data science & engineering
cyberinfrastructure: systems, tools, policies, practices



My expertise is:

- Applications, algorithms, fault tolerance, and programming in parallel and distributed computing
- Software citation & credit mechanisms & practices for software

Problems I'm grappling with:

- Making research software sustainable
- Career paths for computing researchers
- Changing the academic system

I've got my eyes on & want to know more about:

- Experiences others have had, especially successes





Joon Kim

*Cyber Infrastructure Engineer
Advanced Networking, Research Computing
Princeton University
joonk@princeton.edu*

My research:

Designing computer networks to better support scientific research

My expertise is:

- Compute Networks
- Software-defined networking (SDN)

A problem I'm grappling with:

- Finding network bottlenecks and solutions to eliminate them

I've got my eyes on:

- Data streaming, migration, and transfer
- Science that requires low-latency and/or high-bandwidth over the network

I want to know more about:

- How other institutions deal with large data transfers and network-intensive research





Michael Kirby

Scientist I
Scientific Computing Division/Fermilab
kirby@fnal.gov

My research:

MicroBooNE and DUNE neutrino experiments
FIFE Project lead/Distributed Computing Services for non-CMS Fermilab experiments



My expertise is:

High Throughput Computing, Data Management, Hadron-collider and Neutrino Physics

A problem I'm grappling with:

Standard platforms for Deep Learning within HEP at distributed computing resources. Data formatting and delivery for these analysis.

I've got my eyes on:

Deep learning and access to HPC facilities in the next decade and beyond.

I want to know more about:

Common solutions and efforts to define future coordination and prioritization.





Robert Knight

Associate Director, Software & Programming, Research Computing, Office of Information Technology, Princeton University

knight@princeton.edu

My research:

Understanding emerging computer and software architectures

My expertise is:

Programming languages, operating systems and software development

A problem I'm grappling with:

Persuading scientists who have used Fortran for years to adopt current software development technologies

I've got my eyes on:

The Julia, Go and Haskell programming languages

I want to know more about:

Usage of software engineering in HEP



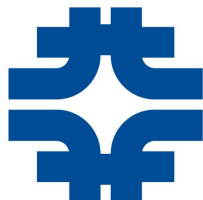


Kyle Knoepfel

Applications Development and Systems Analysis I
Fermi National Accelerator Laboratory
knoepfel@fnal.gov

My research:

I develop the *art* software framework, which is used for online and offline event processing, as well as data analysis. The *art* framework is used by roughly 10 experiments and projects.



My expertise is:

Software design, modern C++ programming, and solving software-related problems brought up by users of our experiments.

A problem I'm grappling with:

Conveying the importance of good software design to experimentalists, and how to encourage users to put it into practice.

I've got my eyes on:

Extending the flexibility of frameworks to be more dynamic. In particular, how does one create an extensible framework that takes advantage of concurrency, user-specified transitions, in the context of a statically typed language like C++.

I want to know more about:

Tools that aid in software development; other languages that could support a framework concept.



Valentin Kuznetsov

*Data scientist at Cornell University
CERN CMS Experiment
vkuznet@gmail.com*

My research:

HEP from theory to CS, building usable software that fits users need, scale and just work.

My expertise is:

Building HEP software, data management and discovery.

A problem I'm grappling with:

How to make things simple.

I've got my eyes on:

Data and ML within HEP and beyond.

I want to know more about:

How users and machines will do what they need to do at exa/zetta-scale.



Cornell University



Charlotte Lee

*Associate Professor
Human Centered Design & Engineering
University of Washington
cplee@uw.edu*

My research:

I research how scientists collaborate in order to inform the design and development of scientific information infrastructures. I collect rich qualitative data on everyday practice in order to generate empirically grounded theory. The aim of these theories, or conceptual frameworks, is to create a basis for a principled approach to the design of collaborative systems, organizations, and ultimately, the endeavor of collaboration itself.

My expertise is:

- Computer Supported Cooperative Work (CSCW)
- Sociological Studies of Infrastructure for Science
- Collaborative Design

Problems I'm grappling with:

- Describing the elements and dynamics of collaboration
- Understanding emergent organizations
- Understanding how to design for emergent organizations.

I've got my eyes on:

How the development and sustenance of software connects sociotechnical systems

I want to know more about:

How, when, and why software does or does not become part of an infrastructure





Matthieu Lefebvre

*Computational Research Application Analyst
Research Computing, Princeton University
ml15@princeton.edu*

My research:

HPC applied to Geosciences and HEP

My expertise is:

Software development and optimization.

A problem I'm grappling with:

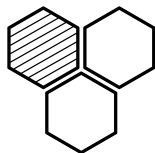
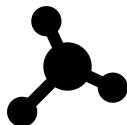
Getting better understanding of the science problem.

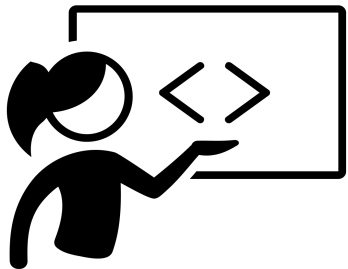
I've got my eyes on:

Multi-core processors, Workflow management.

I want to know more about:

HEP challenges and software ecosystem.





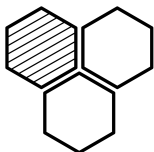
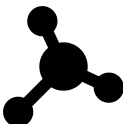
Jinyang Li

<Your title and contact details go here.

Replace images (photo above and images at the bottom) by right clicking and selecting “replace image...”. You can then drag and drop any image. This will automatically resize your image to fit the template.>

My research:

<Replace this text with your information. Replace the images at the bottom with your favourite tool logos (or anything you like!). You can add more, or delete them.>



My expertise is:

<All text can be replaced, but for consistency we recommend the headings remain.>

A problem I’m grappling with:

<All text can be replaced, but for consistency we recommend the headings remain.>

I’ve got my eyes on:

<All text can be replaced, but for consistency we recommend the headings remain.>

I want to know more about:

<All text can be replaced, but for consistency we recommend the headings remain.>



Miron Livny

*John P. Morgridge Professor of Computer Science
University of Wisconsin-Madison
miron@cs.wisc.edu*

My research:

Distributed High Throughput Computing

My expertise is:

Distributed Computing framework and software tools

A problem I'm grappling with:

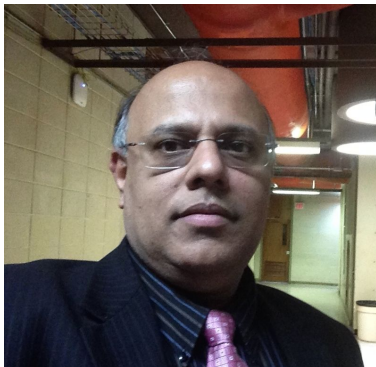
How to avoid reasoning about distributed systems at the level of implementations

I've got my eyes on:

Simple abstractions

I want to know more about:

How to engage the HEP community in a discussion about distributed computing principles



Sudhir Malik

*Associate Professor of Physics
University of Puerto Rico Mayaguez*

My research:

CMS Experiment at LHC
DZero Experiment at Fermilab (Past)

My expertise is:

I always consider myself as a learner though I have spent time building Pixel Detectors for CMS and building Physics Support system for the CMS Users via Training Schools and Tutorials

A problem I'm grappling with:

How to bring new HEP Users up to speed in contributing to Physics Analysis since Software tools have grown complicated and there is a lot of preparation challenge

I've got my eyes on:

Learning new software and computing tools

I want to know more about:

How S2I2 CI initiative can help prepare a future HEP user community



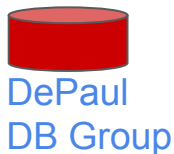
Tanu Malik

Assistant Professor
School of Computing
DePaul University
Chicago IL
tanu@cdm.depaul.edu

<http://dbgroup.cdm.depaul.edu/~tanu>

My research:

Database systems, Data Provenance,
Scientific reproducibility



My expertise is:

Scientific data management issues pertaining to large scale data management, data provenance, and reproducibility

A problem I'm grappling with:

Reconstructing database content from an image without log or system metadata

I've got my eyes on:

How to make databases and scientific applications transparent and reproducible

I want to know more about:

Use of databases, provenance issues in HEP.
Data management and access problems





Carlos Maltzahn

Adjunct Professor

*Director, Center for Research in Open Source Software
University of California, Santa Cruz*

carlosm@ucsc.edu

<http://users.soe.ucsc.edu/~carlosm>

My research:

Big data storage and processing, scalable data management, and distributed system performance management, [reproducibility in systems research](#), computational arithmetic (Unum).

My expertise is:

Distributed systems, storage systems, performance management, network intermediaries, [open-source software engineering](#)

A problem I'm grappling with:

How to enable applications and storage systems to negotiate smart data access strategies.

I've got my eyes on:

How to make performance in large-scale storage systems predictable and reservable.

I want to know more about:

How to intelligently manage shared storage space “commons”.





Shawn McKee

Research Scientist
Department of Physics
University of Michigan
Ann Arbor, Michigan 48109-1120
smckee@umich.edu

My research:

High-energy physics (HEP) with an interest in
dark-matter, dark-energy and cosmology
Cyber-infrastructure to support HEP with a focus on
networking, grid-computing and storage infrastructures.



My expertise is:

Networking for high-energy physics, storage
infrastructures, grid-computing and associated
middleware, tools and applications.

A problem I'm grappling with:

Supporting multi-institutional collaboration when
big data is involved

I've got my eyes on:

Automation tools and processes capable of
consuming diverse types of data and extracting
useful data for optimization, management and
debugging of complex infrastructures.

I want to know more about:

New tools, projects and methodologies related
to areas I work in





Mark Neubauer

*Associate Professor of Physics
University of Illinois at Urbana-Champaign
Principal Investigator for S2I2-HEP and DASPOS Projects
Executive Team, Resources Manager for Open Science Grid
PI, Midwest Tier-2 Computing Center (U. Illinois)*

msn@illinois.edu [@MarkSNeubauer](https://twitter.com/MarkSNeubauer)

<http://physics.illinois.edu/people/directory/profile/msn>

My research:

Searches for new phenomena at the Large Hadron Collider (LHC). Methods for fast triggering at hadron colliders

My expertise is:

High-energy particle physics (HEP), electronics for trigger systems in particle physics, scientific computing

A problem I'm grappling with:

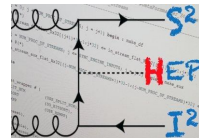
Null results in new physics searches at the LHC. How we can make more sensitive searches that cast a wider net, particularly on the search for dark matter

I've got my eyes on:

Physics prospects of the High-luminosity LHC upgrade and the software & computing challenges for that era. Visualization as a research tool. Machine learning applications for HEP. Analysis preservation and reuse.

I want to know more about:

Ways that HEP and Computer Science (CS) can better collaborate for mutual benefit. Opportunities for industry trends and CS research to disrupt the status quo in our approaches to computing to facilitate our HEP research



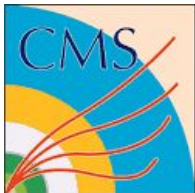


Harvey Newman

*Professor of Physics, Caltech newman@hep.caltech.edu
PI of the DOE/ASCR and HEP SDN GenIA Project and
Co-PI of the SENSE project. Former head of US LHCNet
Chair of the US LHC Users Association*

My research:

High Energy Physics on CMS at the LHC;
Development of global Computing Models for the LHC
experiments and other major science programs. Optimizing
data production and analysis workflow for CMS



Caltech



My expertise is:

High energy physics, high throughput data transfers, global distributed systems

A problem I'm grappling with:

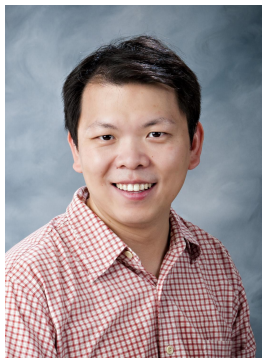
Meeting the near and farther futures needs of the LHC experiments and other programs using intelligent networked-integrated high throughput systems

I've got my eyes on:

The LHC Computing Model for the next runs and for the HL LHC, data intensive SDN developments. System optimization with machine learning

I want to know more about:

How the experiments will use the evolving state of the art in software, computing and network technologies to meet the needs, and forge an effective collaboration with the corresponding communities to accomplish the goals



Nan
Niu

Assistant Professor
EECS, University of Cincinnati
nan.niu@uc.edu
<http://homepages.uc.edu/~niunn/>

My research:

Software engineering, especially how software developers (including end-user programmers) work together to fulfill their goals

My expertise is:

Requirements engineering
Developers' information foraging

A problem I'm grappling with:

Doing social software engineering

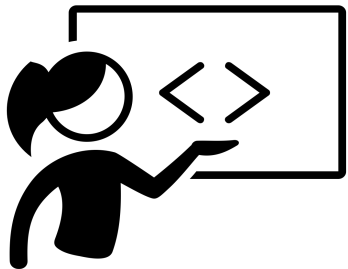
I've got my eyes on:

Reducing developers' information needs in 'social coding'

I want to know more about:

How the HEP community build, maintain, use, retire software



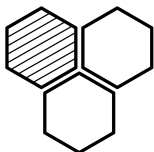
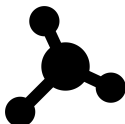


Isobel
Ojalvo

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bottom) by right clicking and selecting “replace image...”.
You can then drag and drop any image. This will
automatically resize your image to fit the template.>*

My research:

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images at the bottom with your favourite tool logos (or
anything you like!). You can add more, or delete them.>



My expertise is:

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recommend the headings remain.>

A problem I’m grappling with:

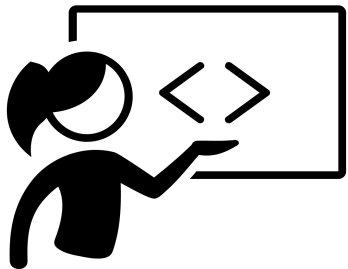
<All text can be replaced, but for consistency we
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I’ve got my eyes on:

<All text can be replaced, but for consistency we
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I want to know more about:

<All text can be replaced, but for consistency we
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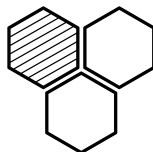
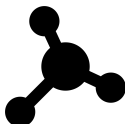
Manish Parashar

<Your title and contact details go here.

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My research:

<Replace this text with your information. Replace the images at the bottom with your favourite tool logos (or anything you like!). You can add more, or delete them.>



My expertise is:

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A problem I’m grappling with:

<All text can be replaced, but for consistency we recommend the headings remain.>

I’ve got my eyes on:

<All text can be replaced, but for consistency we recommend the headings remain.>

I want to know more about:

<All text can be replaced, but for consistency we recommend the headings remain.>



Gabriel Perdue

*Associate Scientist
Fermilab Scientific Computing Division
Coordinator for Deep Learning at Fermilab
perdue@fnal.gov*

My research:

MINERvA (neutrino-nucleus scattering)
DUNE (CP violation, three flavor paradigm)
GENIE (neutrino MC event generator)



My expertise is:

Neutrino physics (especially cross sections),
event generators, simulation, machine learning

A problem I'm grappling with:

Particle identification in neutrino interactions
using deep learning.

I've got my eyes on:

Ways we can use AI and new computing
technologies to do better science at every level
of an analysis. Right now we're answering old
questions with new tools, but what are the new
questions our tools let us ask?

I want to know more about:

Pretty much everything....





Jim Pivarski

DIANA-HEP team member at Fermilab's LPC
Princeton University
pivarski@fnal.gov

My research:

- Software tools for end-user physicists
- Interface between HEP software and Big Data/Machine Learning software from industry



My expertise is:

Physics analysis, Big Data ecosystem, parallelization techniques, programming language design.

A problem I'm grappling with:

Developing a declarative query language expressive enough for HEP.

I've got my eyes on:

The varied ways physicists work; determining what coding styles seem natural to physicists.

I want to know more about:

High performance computing.





Fernanda Psihas

PhD Student & Graduate Research Assistant, Indiana University

On NOvA: Data Watchdogs (operations monitoring) group leader and Young NOvA President.

Coordinator of the machine learning group at Fermilab

My research:

Applications of Convolutional Neural Networks on neutrino event reconstruction.

Lead analyzer on NOvA's electron neutrino appearance and muon neutrino disappearance analyses.



My expertise is:

Neutrino Oscillations

Machine Learning (particularly CNNs)

Community Engagement and Training.

Detector Operations

A problem I'm grappling with:

Full event reconstruction using deep learning.

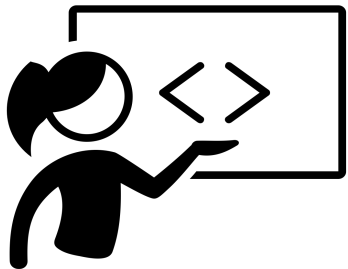
Energy estimation for NOvA analyses

I've got my eyes on:

Engaging the community on machine learning related activities.

I want to know more about:

How the HEP community can benefit from the interplay between physics applications, computer science and industry.



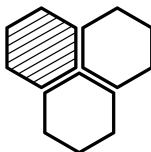
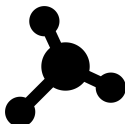
Rajesh Ranganath

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My research:

<Replace this text with your information. Replace the images at the bottom with your favourite tool logos (or anything you like!). You can add more, or delete them.>



My expertise is:

<All text can be replaced, but for consistency we recommend the headings remain.>

A problem I’m grappling with:

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I’ve got my eyes on:

<All text can be replaced, but for consistency we recommend the headings remain.>

I want to know more about:

<All text can be replaced, but for consistency we recommend the headings remain.>



Sumit Saluja

System Administrator, Physics Department, Princeton University

My research:

High Performance computing

My expertise is:

High Performance Computing and Web programming

A problem I'm grappling with:

Performance Tuning of Storage system.

I've got my eyes on:

Go and Angular JS scripting language

I want to know more about:

New Application in High Energy Physics





Elizabeth Sexton- Kennedy

*Software and Computing Coordinator for the CMS
Experiment
Fermilab Staff - Computing Services Architect
sexton@fnal.gov*

My research:

Hadron Collider Physics first on CDF and now on CMS. I'm the architect of CMSSW the production software of CMS: <https://github.com/cms-sw/cmssw>
I'm on the advisory board of LSST, AMCL



My expertise is:

Large scale scientific software and computing solutions for HEP.

A problem I'm grappling with:

How do we build a functional community to solve the software and computing problems of the HL-LHC. How do we sustain what we have.

I've got my eyes on:

Dealing with all of the problems inherent in relying on heterogeneous resources.

I want to know more about:

How to collaborate with people outside of the field of high energy physics computing.



Spencer Smith

*Associate Professor
Computing and Software Department
McMaster University
Hamilton, Ontario, Canada
<http://www.cas.mcmaster.ca/~smiths/>
smiths@mcmaster.ca*

My research:

Adaptation of software engineering methods, tools and principles to improve the quality of scientific computing software



My expertise is:

Software engineering (requirements, design, testing, etc.)

Scientific computing (computational mechanics, FEM, etc.)

A problem I'm grappling with:

Literate scientific software development - generation of software artifacts from knowledge base using Domain Specific Languages (DSLs)

I've got my eyes on:

Code generation, software product line development, assurance cases for software certification

I want to know more about:

Current development of HEP software - goals, equations, tools, design documentation, testing, coding style, etc.



Mike Sokoloff

Professor of Physics, University of Cincinnati. Primary focus of research is flavor physics using data collected by the LHCb experiment at CERN (billions and billions of events).

My research: *Related software development efforts supported by the NSF's PIF program (for GPU-friendly algorithm development) and the SI2 program (for DIANA-HEP -- data intensive analysis tools and the S2I2 Conceptualization Project).*

My expertise is: Charm physics related to particle-antiparticle mixing and CP-violation.

A problem I'm grappling with: Understanding the details of doing time-dependent amplitude analyses for multi-body decays.

I've got my eyes on: Potential performance benefits of using vectorization and highly parallel architectures for software triggers circa 2020-2021.

I want to know more about: How we can compare life-cycle costs of commercial clouds with bespoke resources circa 2020 - 2030.



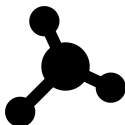


Alexey Svyatkovskiy

*Big Data Analyst, Princeton University
PhD in high-energy physics, Spark Summit speaker
alexey@princeton.edu*

My research:

Apache Spark
Natural language processing (NLP) applications to
American politics
Distributed machine learning applications to fusion
energy
Recurrent Neural Networks



My expertise is:

Big Data ecosystem, NLP, distributed machine learning, physics

A problem I'm grappling with:

I've got my eyes on:

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I want to know more about:

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Michela Taufer

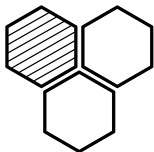
Associate Professor
University of Delaware

taufer@udel.edu

<https://gcl.cis.udel.edu/personal/taufer/>

My research:

High performance computing; scientific applications and their programmability on distributed systems; numerical reproducibility and stability of scientific applications; big data analytics and MapReduce.



My expertise is:
See my research.

A problem I'm grappling with:
How non-determinism in applications at large scale relates and impacts both numerical reproducibility and debugging.

I've got my eyes on:
See the problem above.

I want to know more about:
HEP applications and their non-determinism



Douglas Thain

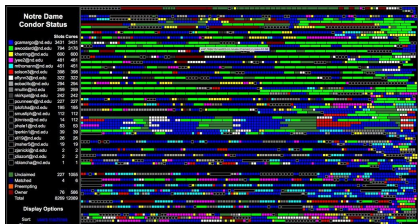
Associate Professor
University of Notre Dame

dthain@nd.edu

<http://www.nd.edu/~dthain>

My research:

Design of distributed systems for large scale scientific computing in fields such as high energy physics.
molecular dynamics, bioinformatics



My expertise is:

Workflows, file systems, high throughput computing, open source software engineering.

A problem I'm grappling with:

How to reliably deploy complex systems with many dependencies without endless debugging.

I've got my eyes on:

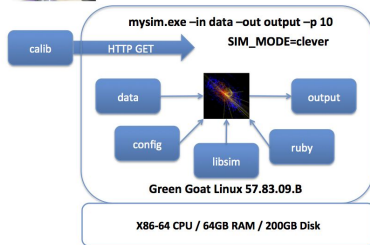
Techniques for preservation and reproducibility of complex workflows.

I want to know more about:

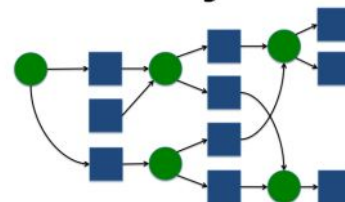
How we can better align the interests, skills, and incentives of CS research in distributed systems with production computing for big science.



I want to preserve my simulation method
and results so other people can try it out.



Makeflow



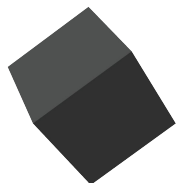


Dustin Tran

Ph.D. Student
Columbia University
dustin@cs.columbia.edu ([@dustinvtran](https://twitter.com/dustinvtran), *Twitter*)
<http://dustintran.com>

My research:

Bayesian statistics, machine learning, and deep learning. I work on general methodology and applications of probabilistic models.



My expertise is:

Probabilistic programming, Bayesian analysis, deep learning, variational inference.

A problem I'm grappling with:

How Edward (<http://edwardlib.org>) might be useful in your applications.

I've got my eyes on:

Existing tools and pipelines for probabilistic modeling and inference.

I want to know more about:

HEP applications, HEP software, and current problems and solutions.



Chris Tunnell

Astroparticle physicist

*Center Postdoctoral Fellow at Kavli Institute for
Cosmological Physics, University of Chicago*

XENON1T Analysis coordinator

*Author and maintainer of XENON *ax software*

Python enthusiast

tunnell@uchicago.edu, Github: tunnell and XENON1T

My research:

Astroparticle physics. Dark matter and neutrino experiments, with a passion for showing that good modern software leads to great physics results.

My expertise is:

Develop elegant processing and analysis pipelines for more than 10 small to medium sized experiments over the years.

A problem I'm grappling with:

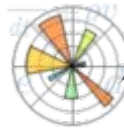
Non-LHC experiments have fewer people so we need to use modern tools, but this is difficult with HEP infrastructure, ROOT, and other LHC tools since non-HEP community bigger.

I've got my eyes on:

Collaboration on focusing where we are good (I/O) and helping with service-based infrastructure or breaking up ROOT "package manager" into bitesized pieces.

I want to know more about:

What others are up to? Can I develop tools like I would for well-documented easy AWS but use your infrastructure?



mongo



Eric Vaandering

*Computational Physics Software Developer
CMS Data and Workflow Management Lead
Fermilab
ewv@fnal.gov*

My research:

<Replace this text with your information. Replace the images at the bottom with your favourite tool logos (or anything you like!). You can add more, or delete them.>

My expertise is:

HEP, workflow management, machine learning

A problem I'm grappling with:

Enabling workflow processing on new types of resources

Data management and movement in the HL-LHC era

I've got my eyes on:

Modular components for workflow construction, relationships

I want to know more about:

<All text can be replaced, but for consistency we recommend the headings remain.>





Ilija Vukotic

*HEP physicist turned computing scientist at
University of Chicago, Enrico Fermi Institute*
ivukotic@uchicago.edu Skype: ivukotic

My research:

Federated WAN data access, data analytics,
improvements of ATLAS distributed computing using
machine learning techniques, event and outreach
visualizations using VR.

My expertise is:

I/O, WAN, ML techniques, VR

A problem I'm grappling with:

Lack of time to do everything I want to do :)

I've got my eyes on:

Intelligent anomaly detection systems,
neuromorphic computing

I want to know more about:

Local data caching, non-ROOT event data
storage/analysis



THE UNIVERSITY OF
CHICAGO





Rick Wagner

*Professional Services Manager
Former HPC Systems Manager & Astrophysicist
Globus, University of Chicago & Argonne National Lab
rick@globus.org*

My research:

Federated data management, Lustre
Helping projects integrate the Globus Platform

My expertise is:

HPC, parallel file systems (at least Lustre)

A problem I'm grappling with:

Security

I've got my eyes on:

Containers

I want to know more about:

Sustainability models for research software



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CHICAGO





Gordon Watts

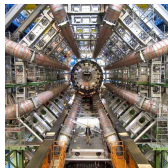
Physicist, Professor
Department of Physics,
University of Washington/Seattle

gwatts@uw.edu

<my website hasn't been updated since...>

My research:

Evolved from Standard Model (top quark) to Exotics (long lived particles). Currently focusing on long lived particle decays in the calorimeter, using ML techniques. Also involved with a new ultra long lived experiment.



My expertise is:

Data preservation, analysis techniques and tools; I've worked on almost all phases from trigger to plotting.

A problem I'm grappling with:

How to fit ML into our workflow. How to make it possible for students to understand our software so they can do physics. How to understand how a plot was made 6 months later. Herding cats.

I've got my eyes on:

Python and its family of tools to handle big data and ML. New data structures to thread selection cuts to a plot.

I want to know more about:

Modern tools used to attack problems similar to ours outside of HEP.





Justin M Wozniak

*Computer Scientist, Argonne National Laboratory
Fellow, Computation Institute, University of Chicago*

<http://www.mcs.anl.gov/~wozniak>
wozniak@mcs.anl.gov

My research:

Developing scalable workflow systems,
e-science tools and techniques, in situ analysis,
modeling light source workloads

My expertise is:

Parallel programming, scientific workflows,
modeling computer systems

A problem I'm grappling with:

Coupling complex codes, spanning workflow
use cases and requirements

I've got my eyes on:

Exascale science cases, experiment-in-the-loop
workflows, integrating the Python ecosystem

I want to know more about:

Workflow requirements and challenges,
common scientific programming problems



THE UNIVERSITY OF
CHICAGO



Frank Wuerthwein

Professor of Physics UCSD
HTC group lead at SDSC.
Executive Director, Open Science Grid

My research:

Search for new physics with CMS in final states with MET.

Computing challenges that limit me in getting my science done.

A wider desire to integrate distributed computing across institutional boundaries for the benefit of all of science.

My expertise is:

Distributed High Throughput Computing

A problem I'm grappling with:

How to integrate CI across institutions and science teams at all scales and business models, from single PI to large international experiments, from small colleges to national labs, covering sharing, allocations, and commercial cloud.

I've got my eyes on:

I'm thinking about the big assumptions that drive the HL-LHC computing budget. I firmly believe that a better understanding of how we work today is the key to radically rethinking how we work 10 years from now.

I want to know more about:

Vectorization. In HEP we are less and less able to use the silicon we buy. This is scary to me, especially given the resource needs projections for HL-LHC.