



# David Abdurachmanov

Software Engineer,  
University of Nebraska–Lincoln & U.S. CMS Operations,  
DIANA-HEP  
[davidlt@cern.ch](mailto:davidlt@cern.ch)

## My research:

AArch64/ppc64le architectures for CMS Software (CMSSW) and other LHC experiments; compression improvements in ROOT IO; benchmarking new CPUs/SOCs and other silicons or/and features.

## My expertise is:

Would not call myself “expert”, but: alternative architectures (AArch64/ppc64le) enablement/porting, benchmarking, software packaging.

## A problem I’m grappling with:

Proving that alternative architectures or mix of them in WLCG (and beyond) could work.

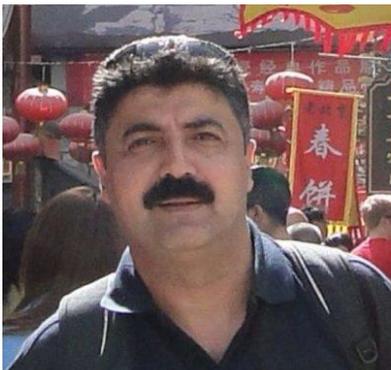
## I’ve got my eyes on:

Anything that touches new hardware; industry + open source community + HEP collaboration.

## I want to know more about:

Heterogeneous computing needs in HEP.





# Mohammad Al-Turany

*Senior scientist at GSI/CERN*

## **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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**FairRoot**

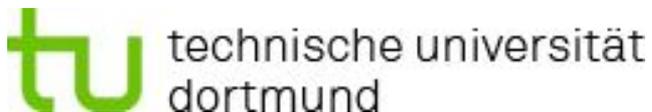


# Johannes Albrecht

*Group leader at TU Dortmund, Germany  
LHCb upgrade performance coordinator*

*Physicist working on LHCb Analysis, Trigger and event reconstruction*

*<http://www.e5.physik.tu-dortmund.de/albrecht/>*



## **My expertise is:**

Data analysis and event reconstruction, pattern recognition

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

Running a full event reconstruction at 30MHz

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

Vectorization, MVA / deep learning,

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

Reconstruction and optimal use of CPU / alternative architectures





# Makoto Asai

*Project Lead  
Elementary Particle Physics Division  
SLAC National Accelerator Laboratory  
and  
Spokesperson of the Geant4 Collaboration*

## **My research:**

Detector simulation (Geant4, ATLAS, etc.)

## **My expertise is:**

Detector simulation

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

Detector simulation

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

Detector simulation

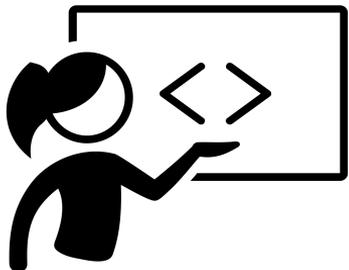
## **I want to know more about:**

Community's needs on  
detector simulation



NATIONAL  
ACCELERATOR  
LABORATORY

# Geant 4



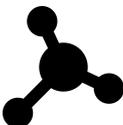
# Lothar Bauerdick

*Senior Scientist at Fermi National Accelerator Lab*

[bauerdick@fnal.gov](mailto: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?



# Dario Berzano

*Physicist devoted to computing.*

*Currently at CERN working on software lifecycle operations and infrastructures within the ALICE Offline and ALICE O2 Run 3 upgrade.*

## **My research:**

Distributed high-throughput computing, opportunistic exploitation of computing resources, efficient scheduling of containerized applications, make software tools scale from the user's laptop to the large scale.



MESOS



## **My expertise is:**

Apache Mesos, HTCondor, CVMFS, compilers and build tools, monitoring.

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

Moving the development lifecycle of a large number of developers to a modern paradigm.

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

HPC facilities: uniformize software distribution and environment consistency. Exploit them for current and future HEP use cases. Common Workflow Language applications.

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

Conditions database lifecycle of other HEP experiments. Analysis paradigms and facilities in 10 years from now.



# Wahid Bhimji

*Data and Analytics Group  
NERSC , Berkeley Lab  
wbhimji@lbl.gov*

## **My research:**

Enabling HEP (and other experimental science) on HPC  
Deep Learning (for HEP ) (on HPC)

## **My expertise is:**

Data Management, data analysis ,  
Grid storage , HPC

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

Software delivery on HPC, Mach

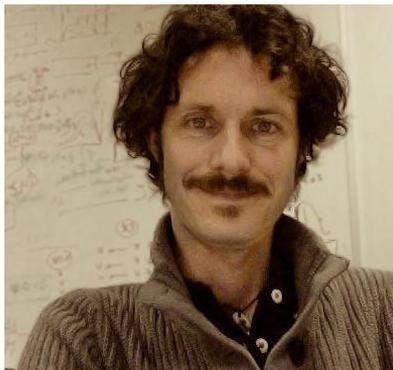
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## **I want to know more about:**

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# Riccardo Maria Bianchi

*Particle physicist specialized in developing Scientific Software*

*Working at CERN in the ATLAS Offline Software  
Postdoc at University of Pittsburgh*

## **My research:**

Interactive real-time data visualization  
Multi-threading and concurrency  
Detector geometry description  
SUSY searches



## **My expertise is:**

C++, Python, Multi-threading and concurrency,  
3D visualization

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

The possibility of developing a modern  
experiment-agnostic event display

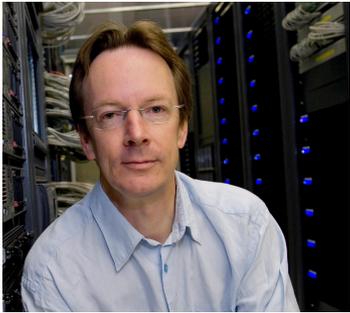
## **I've got my eyes on:**

New graphics engines, concurrency and math  
libraries

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

Machine learning



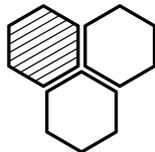
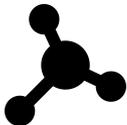


# Ian Bird

*Senior scientist at CERN  
WLCG Project Leader  
CERN-IT Management of Scientific Computing*

## **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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# Brian Bockelman

*Associate Research  
Professor  
Department of  
Computer Science and  
Engineering.  
University of  
Nebraska-Lincoln*

## **My research:**

Distributed High Throughput Computing  
Data distribution and management  
Faster data processing techniques



## **My expertise is:**

HTCondor, RIO, GlideinWMS, CVMFS, XRootD

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

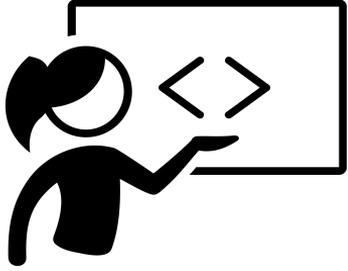
Managing the size and complexity of the RIO stack

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

Containers

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

Machine Learning

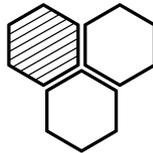
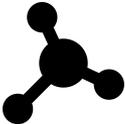


# Amber Boehnlein

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bottom) by right clicking and selecting “replace image...”.  
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## **My research:**

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## **My expertise is:**

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## **I’ve got my eyes on:**

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

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# Daniele Bonacorsi

*Professor of Physics, University of Bologna (Italy)  
Currently CMS Software/Computing co-coordinator*

## **My research:**

Physics: QCD at LEP2, top physics at LHC

Computing: Grid(s), Distributed HTC, ML/Analytics

## **My s/expertise/familiarity/ is:**

Distributed HTC, CMS Computing, WLCG challenges

## **A s/problem/task/ I'm grappling with:**

The value of a deeper understanding of how we designed, deployed and operated successful computing systems and tools so far for HEP, as a founding base for anything “next-gen”.

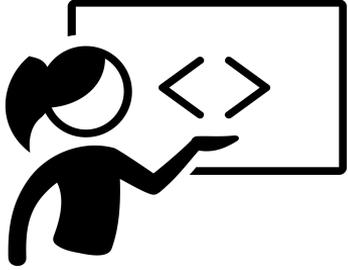
## **I've got my s/eyes/headaches/ on:**

ML/DL/AI/Analytics

## **I want to s/know/collaborate/ more with:**

Anyone (from any community, not just HEP) interested to join efforts on exploiting Big Data ecosystem tools to build and test prototypes capable to flexibly attack common/similar challenges.



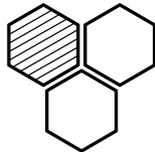
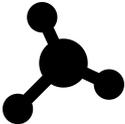


# Joseph Boudreau

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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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# 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:**

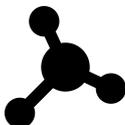
How to run HL-LHC pattern recognition ten  
times faster, and on 10 times more cores

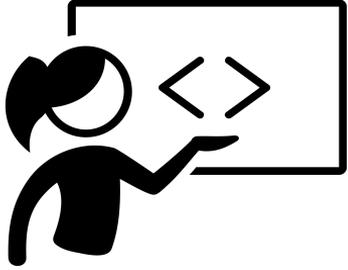
## **I've got my eyes on:**

Neuromorphic Computing

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

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



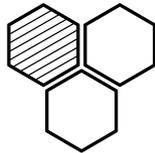
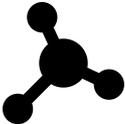


# Simone Campana

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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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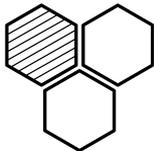
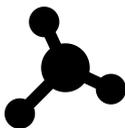


# Federico Carminati

*Senior Programming Physicist*  
*CERN-PH / 1211 Geneva 23 / Switzerland*  
Tel: +41 22 76 74959  
Fax: +41 22 76 68505  
Mobile: +41 75 411 4843

## **My research:**

Responsible for the detector simulation activities in the Software Group of CERN EP. This include a large contribution to GEANT4 and R&D for the next generation of codes with the GEANTV project The aim is to continue the development of the physics capabilities and to obtain better performances on modern computing architectures as well as on accelerators such as graphics cards (GPU).



## **My expertise is:**

Computing for Physics. Monte Carlo simulation.  
High Performance Computing. Grid computing

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

Write portable code with good performance on different architectures.

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

Fast simulation via multi-objective machine learning.

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

Other developments in HPC for HEP.





# Taylor Childers

*Software Engineer, Argonne National Laboratory  
jchilders@anl.gov*

## **My research:**

- Scaling applications on supercomputers, such as ATLAS Geant4 simulation, LHC Event Generators, and Machine Learning libraries
- Using ML image recognition techniques to identify physics objects from low level detector data.



Leadership  
Computing  
Facility



## **My expertise is:**

I'm experienced in scaling serial codes on HPC systems using MPI to reach millions of parallel threads. My background is in trigger ops.

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

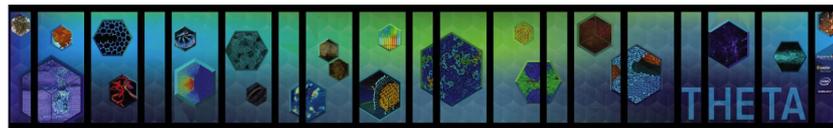
How to scale ATLAS Geant4 Simulation to millions of threads on Cori at NERSC.

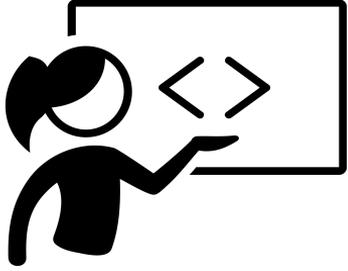
## **I've got my eyes on:**

Using ML for physics object reconstruction.

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

Building machine learning models for image recognition and localization.



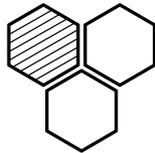
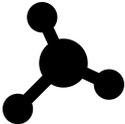


# Kaushik De

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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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# Andrea Dotti

*Information System Specialist*  
*adotti@slac.stanford.edu*

## **My research:**

Provide HEP experiments with precise, fast and reliable detector simulations, ready for the challenges of the next generation of experiments

## **My expertise is:**

Detector Simulations, Simulation (Physics)  
Validations, Parallel Computing

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

Being able to run large code-base on modern highly-parallel architectures

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

Generative NN to replace CPU-intensive algorithms  
Use of public clouds

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

How can we learn more from each other, sharing the best practices? What can we learn from experience of non-HEP domains?



# Geant 4





# 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](mailto: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.

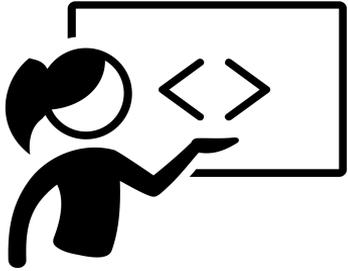
## **I've got my eyes on:**

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 better on those problems.



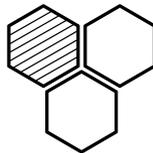
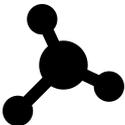


# V.Daniel Elvira

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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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# Giulio Eulisse

*Applied Physicist (Computing) @ CERN*

## **My research:**

Alice Experiment Software Group

## **My expertise is:**

Tools, QA, Performance Optimization,  
Framework, Event Display, DevOps

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

Efficiently deploy, manage and optimize  
thousands of communicating processes in a  
dynamic and scalable manner

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

Mesos, Docker, ZeroMQ, Spark

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

Software Process, Machine Learning, Data  
Center Computing





# Amir Farbin

*Associate Professor  
University of Texas Arlington  
afarbin@uta.edu*

## **My research:**

*ATLAS Experiment:* SUSY Searches (Razor/Jigsaw Technique), Physics Analysis Tools Coordinator, Tile Calorimeter. New focus: Trigger Transition to multi-threaded framework.

*DUNE Experiment:* Deputy Computing Coordinator

*LArLAT Experiment:* Deep Learning-based Reconstruction

*MiniBooNE Experiment:* sub-GeV Dark Matter Searches



## **My expertise is:**

Physics Analysis Software, Event Data Model, HEP and Deep Learning Frameworks, Deep Learning, GPUs.

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

Applying Deep Learning techniques to various HEP problems. Building/Operating GPU cluster for large DL training. Working across experiments and frontiers.

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

Moore's Law and HL-LHC requirements. Future Frameworks that use dataflow and data parallel programming and can efficiently utilize many-core processors, co-processors (e.g GPU, FPGAs), and integrate Deep Learning.

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

Hardware and software landscape a decade from now.



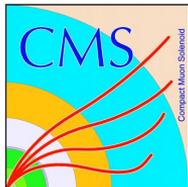
# Ian Fisk

*Co-Leader of the Computing Core  
Flation Institute  
Simons Foundation  
162 Fifth Avenue  
New York, NY 10010*

*[ifisk@simonsfoundation.org](mailto:ifisk@simonsfoundation.org)*

## **My research:**

CMS Computing, Data Management



## **My expertise is:**

Large scale distributed computing

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

Using HEP Tools in a variety of data intensive sciences

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

Looking at Machine learning techniques for event and object identification

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

Technology Improvements



# Frank Gaede

*Senior Physicist at DESY  
Software and Computing Coordinator of ILD  
Co-Coordinator of AIDA2020-WP3  
Member of the CRSG  
frank.gaede@desy.de*

## **My research:**

Design and development of all aspects of event processing software for the Linear Collider.

## **My expertise is:**

Scientific software development for HEP, mostly in C++.

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

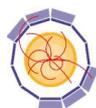
Maintaining and further improving a large code stack for a growing user community.

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

Pattern recognition algorithms.

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

Parallelization and Vectorization.



**AIDA**<sup>2020</sup>



HEP Software Foundation



# 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





# Maria Girone

*CERN openlab Chief Technology Officer*

## **My research:**

I work in CERN openlab as CTO to coordinate the R&D activities with industry and the LHC programme. Former CMS computing and software coordinator and WLCG operation coordinator, I have a strong interest in the computing R&D program for HL-LHC. I am also co-coordinating the CMS software and computing R&D.



## **My expertise is:**

Computing operations, new service deployment, computing upgrades and adoption of new techniques, including those from industry.

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

Resource gap at the HL-LHC

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

Definition of the next phase of openlab to efficiently contribute to some of the challenges for the HL-LHC

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

Technology improvements and the needs from our community for software and infrastructure towards HL-LHC



# Sergei V Gleyzer

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





# Vladimir Vava Gligorov

[vgligoro@lfnhe.in2p3.fr](mailto:vgligoro@lfnhe.in2p3.fr), @particleist

## My research:

All my research has been conducted on LHCb. I have mainly worked on real-time data analysis and precision tests of the Standard Model in the decays of heavy flavour hadrons, with some digressions into heavy flavour spectroscopy. I also spend time working on physics masterclasses and mentoring at the Petnica Science Centre.



## My expertise is:

“Expert” is an unscientific category

## A problem I’m grappling with:

How to work collaboratively in a capitalist economic system

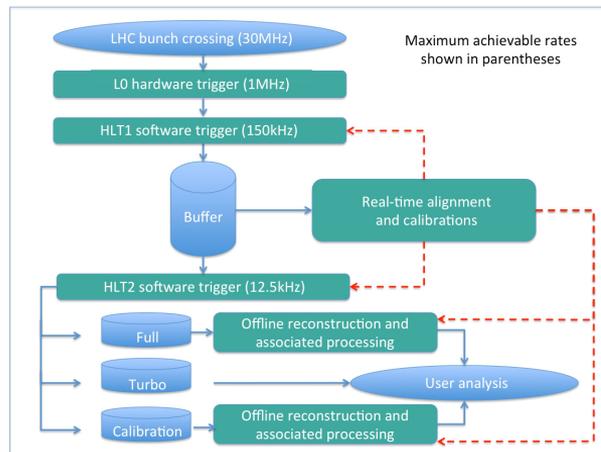
## I’ve got my eyes on:

Answer I’d like to give : some deep and meaningful insight

Reality : an email

## I want to know more about:

Whether nature is actually nonlocal at microscopic scales





# Claudio Grandi

*Chairman of the INFN Computing and Networks Commission*  
*Member of the CMS Computing “Dynamic Resource Provisioning Group”*  
*Claudio.Grandi@bo.infn.it*

## **My research:**

INFN computing management  
CMS distributed computing

## **My expertise is:**

Distributed computing

## **A problem I’m grappling with:**

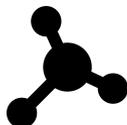
Evolution of INFN computing  
Evolution of CMS distributed computing

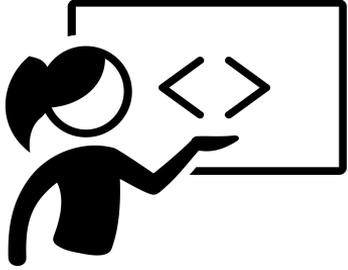
## **I’ve got my eyes on:**

Grids & Clouds; networks  
Computing resource management in general

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

How to match the user requests with the available money



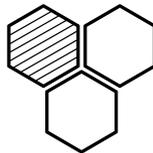
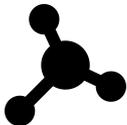


# Lindsey Gray

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bottom) by right clicking and selecting “replace image...”.  
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automatically resize your image to fit the template.>*

## **My research:**

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anything you like!). You can add more, or delete them.>



## **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:**

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



# Dick Greenwood

*Professor of Physics  
Louisiana Tech University  
greenw@latech.edu*

## **My research:**

Top physics and SUSY Searches with ATLAS,  
Triggering on Jets with GPUs

## **My expertise is:**

HEP analysis, simulations, Distributed computing

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

Development of Trigger systems for the future high pileup environment at the LHC

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

Developments in GPU and FPGA Technologies

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

Deep Learning training with GPUs





# Oliver Gutsche

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

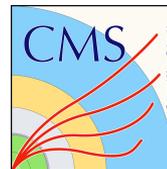
Enabling analysis of exascale datasets by a very large diverse group of researchers

## **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.





# Thomas Hacker

*Professor of Computer and Information Technology  
Purdue University  
West Lafayette, Indiana  
tjhacker@purdue.edu*

## **My research:**

Cyberinfrastructure, HPC system reliability, research computing.

## **My expertise is:**

Networking, operating systems, cyberinfrastructure, reliability.

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

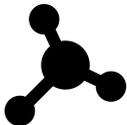
Collecting visual data from structures.

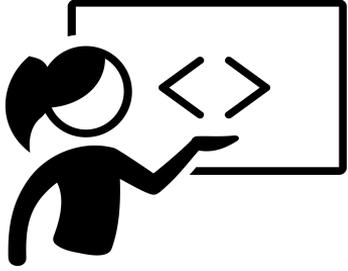
## **I've got my eyes on:**

Markov Random Field based classification.

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

Automatically measuring optical spatial resolution.





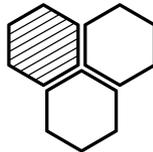
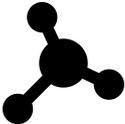
# Andrew (Andy) Hanushevsky

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## My research:

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## My expertise is:

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## A problem I’m grappling with:

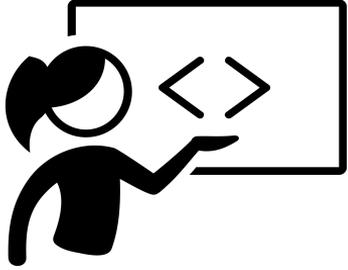
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## I want to know more about:

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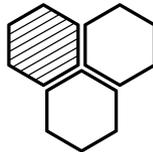
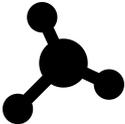


# John Harvey

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## **My research:**

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## **My expertise is:**

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## **A problem I’m grappling with:**

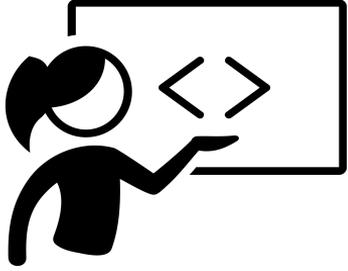
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## **I’ve got my eyes on:**

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

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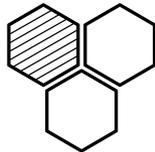
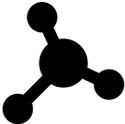


# Richard (Chip) Hay

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## **My expertise is:**

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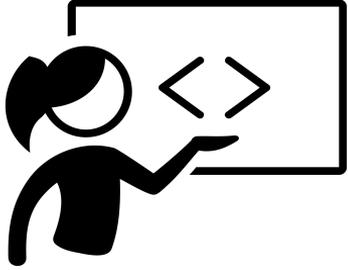
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## **I’ve got my eyes on:**

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

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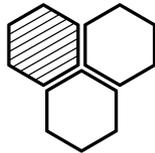
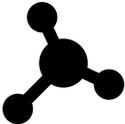


# Benedikt Hegner

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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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# 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.

## 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

## 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](mailto: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





# Burt Holzman

*Coordinator for Scientific Computing Facilities, Fermilab  
Assistant Division Head, Scientific Computing  
HEPCloud Leadership*  
[burt@fnal.gov](mailto:burt@fnal.gov)

## **My research:**

HEPCloud: the evolution of scientific computing facilities for high energy physics, enabling science at the cutting-edge of what industry and the academic communities provide. (I also know a bit about femtoscopic probes in heavy ion collisions.)



## **My expertise is:**

Focused on HEP and high throughput computing: scientific computing infrastructure, workload management, data management. Distributed scientific computing on the grid and cloud. (Jack of all trades, master of none?)

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

Preparing for the HL-LHC deluge while ensuring new experiments focus on distributed computing from the ground up.

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

Commercial clouds and HPC resources.

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

Interest and research areas where we overlap





# Dirk Hufnagel

*Application Developer and System Analyst*  
*HEPCloud Leadership*  
*Fermilab*  
[hufnagel@fnal.gov](mailto:hufnagel@fnal.gov)

## **My research:**

The intersection of workflow and data management with the resources and infrastructure they run on and interact with.



## **My expertise is:**

HEP distributed computing, workflow and data management, quasi real time processing systems (Tier0 processing), non-standard resources.

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

How to make HPC (and other non-standard) resources transparently usable for HEP.

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

Commercial clouds and HPC.

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

Can we simplify things enough to find common ground ?





# Bo Jayatilaka

*Applications Physicist  
Deputy department head, data movement and storage  
Fermilab. [boj@fnal.gov](mailto:boj@fnal.gov) [home.fnal.gov/~boj](http://home.fnal.gov/~boj)*

## **My research:**

Search for dark matter and other new phenomena with CMS

## **My expertise is:**

High performance and high throughput computing, storage architectures, data movement, precision physics with colliders

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

Doing less with more as it pertains to the coming exascale torrent of HL-LHC data

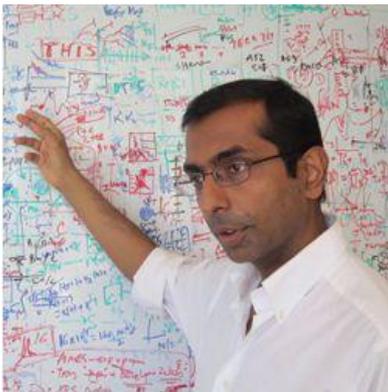
## **I've got my eyes on:**

Breaking the existing LHC computing model as it makes sense, especially in terms of where we store data

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

Big data trends in industry that we aren't using





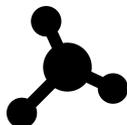
# Shantenu Jha

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..



# Ivo Jimenez

PhD candidate at the [UCSC Computer Science Department](#) and a member of the [Systems Research Lab](#). My advisor is Professor [Carlos Maltzahn](#).

## My research:

My thesis work addresses the [reproducible validation of computer systems research](#).

## My expertise is:

I specialize in distributed data management systems.

## A problem I'm grappling with:

How do we define common conventions in a domain-independent way in order to easily reproduce experiments?

## I've got my eyes on:

Defining new methodology to fully automate the end-to-end execution and validation of experiments.

## I want to know more about:

How the HSF community deals with reproducibility issues and how can we use [Popper](#) in this context





# 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

## **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



# Michel Jouvin

Head of Computing Division, Laboratoire de  
l'Accélérateur Linéaire (LAL), Orsay, France

<http://www.lal.in2p3.fr>

## My research:

- Distributed computing: grids and clouds
- Data management
- Software development processes
- Collaboration around software development



## My expertise is:

- Grid and cloud management
- Data storage and management technologies
- Software development processes and tools

## A problem I'm grappling with:

- Spark and cloud integration
- Ceph storage technology

## I've got my eyes on:

- Software performance
- DSL programming languages

## I want to know more about:

- Integration of new processor architectures
- New approaches for tracking





# 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](mailto:d.katz@ieee.org) or [dskatz@illinois.edu](mailto:dskatz@illinois.edu)  
[danielskatz.org](http://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





# Dorian Kcira

*Research Scientist at the California Institute of  
Technology since 2008*

## **My research:**

Computing and networks for big scientific data.

## **My expertise is:**

Distributed computing systems, computer networks, fast data transfers.

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

Configuring and tuning a distributed file system that is able to deal with large amounts of data and perform for fast data transfers.

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

Understand how scientific computing will evolve, how does cloud factor in this and what are the related changes we need to make on the network side.

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

How GPUs will affect LHC computing.

# Caltech





# Alexei Klimentov

*Physics Application Software Group Head  
at Brookhaven National Laboratory.  
Workflow Management Software coLead in ATLAS  
ML working group coLead (WLCG demo project)  
BigPanDA project lead PI*

## **My research:**

High-throughput and high-performance computing  
LCF for HEP and data intensive science  
Workload Management Systems

## **My expertise and interests are:**

High- performance and high-throughput  
computing, Workload and Data  
Management Systems, HEP application  
software, LCF usage for  
compute-intensive applications

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

Workflow and data management at LHC

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

LHC Computing Model, WMS, ML for  
distributed computing

**BROOKHAVEN**  
NATIONAL LABORATORY





# Thorsten Kollegger

Senior Scientist at GSI & FAIR  
[t.kollegger@gsi.de](mailto:t.kollegger@gsi.de)

## My research:

Developing the computing eco-system for FAIR and other experiments, e.g. ALICE

## My expertise is:

HLTs, computing models, computing facilities, software optimization

## 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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# Jim Kowalkowski

*Computer Science Researcher  
Division Software R&D Coordinator  
Deputy Head Systems for Scientific Applications*

## **My research:**

My principal focus is algorithms and large scale software systems for data analysis and detector simulation for high energy experimental physics. This includes developments to increase scientific software productivity through better use of tools, programming techniques, and methodologies.

## **My expertise is:**

Systems architecture, design, implementation. C++, distributed computing

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

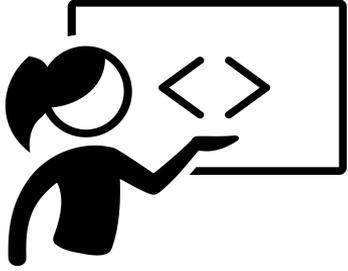
Seeing big data machinery solve a large-scale problem in HEP. Moving algorithms and software infrastructure to HPC within the intensity frontier.

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

New memory architectures that are beginning to be available on HPC systems. The new IBM/Nvidia machines. Distributed machine learning.

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

Solutions to the problems I'm grappling with and things I got my eyes on.

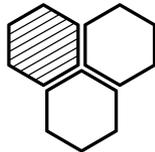
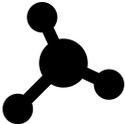


# Slava Krutelyov

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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:

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



# 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



# Eric Lançon

*Physicist at Brookhaven National Laboratory  
Director of the Scientific Data and Computing Center  
elancon@bnl.gov*

## **My research:**

Provide computing resources for the various physics programs of BNL : High Energy Physics, Nuclear Physics, Life science,...

## **My expertise is:**

Distributed computing, project management

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

Integrating new hardware into production

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

Opportunities and new ideas

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

Potential use of GPUs for High Energy Physics



# David Lange

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

## My research:

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

## My expertise is:

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

## A problem I'm grappling with:

- Leveraging scientific python for HEP

## I've got my eyes on:

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

## I want to know more about:

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





# Kevin Lannon

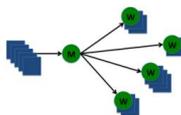
*Associate Professor of Physics  
University of Notre Dame  
(CMS Collaboration)  
klannon@nd.edu*

## **My research:**

I'm obsessed with the enormous mass of the top quark, which is the most massive known particle. I look for hints about why the top quark is so heavy by studying very rare processes involving top quark and other particles.



*Work Queue*



## **My expertise is:**

I dabble in lots of things: top and Higgs physics, opportunistic distributed computing, machine learning.

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

How can we generate 1-2 orders of magnitude more simulated data that seems necessary for deep learning approaches.

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

The data preservation folks. I'd like to borrow their portability techniques to run code today on unexpected resources.

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

How machine learning toolkits are evolving.



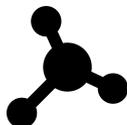


# Matthieu Lefebvre

*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.



# Antonio Limosani

*Senior Researcher, University of Sydney  
ATLAS Project Associate, CERN  
Chief Investigator, Australian Research Council Centre  
of Excellence for Particle Physics at the Terascale  
antonio.limosani@cern.ch*

## **My research:**

- Software performance monitoring and optimisation of ATLAS reconstruction workflows
- Studies of the Higgs Boson



THE UNIVERSITY OF  
SYDNEY



## **My expertise is:**

Software performance monitoring and optimisation tools and physics data analysis.

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

Software performance monitoring in the soon to be commissioned multi-threaded ATLAS workflows

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

Big data analytics of software and systems performance

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

How HEP can develop and use existing open-source projects and applications.



# 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



# Carlos Maltzahn

*Adjunct Professor*  
*Director, Center for Research in Open Source Software*  
*University of California, Santa Cruz*  
[carlosm@ucsc.edu](mailto: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”.





# Pere Mato

*Senior Applied Physicist at CERN  
ROOT Project Leader, EP-SFT Group leader, HSF  
Startup Team  
pere.mato@cern.ch*

## **My research:**

Software support to the experiments, scientific software development, data processing frameworks

## **My expertise is:**

DAQ, detector controls, software architecture, data processing frameworks, ROOT, software building and continuous integration

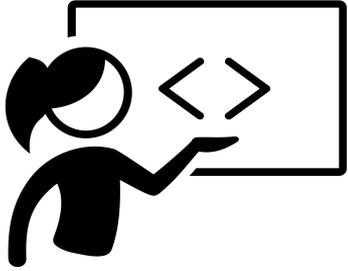
## **A problem I'm grappling with:**

Make HSF a success engaging the full HEP community

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

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



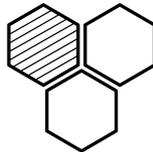
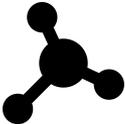


# Paul Mattione

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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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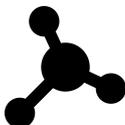


# Helge Meinhard

*Principal Applied Physicist  
IT Department  
CERN (European Organization for Nuclear Research)  
Helge.Meinhard@cern.ch*

## **My research:**

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## **My expertise is:**

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

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

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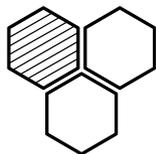


# Dario Menasce

*Research staff at INFN Milano Bicocca. Member of CMS and Vice-President of the Computing Committee of INFN (till last November), now member of the newly appointed Scientific Computing Committee of INFN*

## **My research:**

Besides my official duties in the Computing Committees I'm a member of the HSF Startup-team (since the beginning). I'm involved in the Pixel Detector activities of the CMS experiment (commissioning and test-beams) and in efforts to port tracking inner tracking code to GPU.



## **My expertise is:**

DAQ software, data analysis, complex and advanced interactive web interfaces

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

Contribute to create a community whose main objective is training and tutoring in scientific software (not necessarily restricted to HEP)

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

HSF as a possible way to create a community to address the problem of making SW both central and sustainable in scientific endeavors

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

Everything that can help the process to improve the effectiveness of such a community





# Parag Mhashilkar

*Group Leader of Workflow Management & Provisioning  
Group in Computing Division at Fermilab  
parag@fnal.gov*

## **My research:**

High Throughput Computing

## **My expertise is:**

Workflow & Workload Management, Resource Provisioning

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

Efficient provisioning of resources in HPC clusters & Clouds.

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

Elastic Computing for HEP

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

Machine Learning, Computing Models

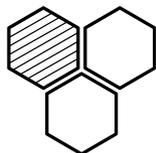
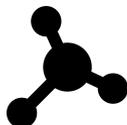


# Bogdan Mihaila

*Program Director, National Science Foundation  
Theoretical Nuclear Physics and Computational Physics  
Physics Division  
bmihaila@nsf.gov*

## **My research:**

Theoretical and computational physics with many-body applications to cold atoms, condensed matter, nuclear and high-energy physics.



## **My expertise is:**

Algorithm development and high-performance computing for scientific and engineering applications.



# Lorenzo Moneta

*Senior Applied Physicist at CERN  
Responsible for ROOT Mathematical and Statistical  
libraries.*

## **My research:**

Scientific software development and support for HEP  
Experiment, especially statistical software and Machine  
Learning



**IML**



## **My expertise is:**

Numerical software, statistical data analysis,  
ROOT

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

Modernize current HEP software (ROOT) for  
data analysis of HL-LHC data.

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

New ML tools, software parallelization and  
vectorization

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

New software developments in the HEP  
community and outside related to data analysis  
(statistical inference, machine learning)





# Richard Mount

*Senior Scientist at SLAC National Accelerator Lab.  
CHEP 2016 Conference co-chair  
ATLAS Computing Coordinator 2014-2015*

## **My research:**

ATLAS (BaBar, L3, Mark-J, EMC in the past)  
Challenges and solutions in data-intensive science

## **My expertise is:**

Many decades of experience in HEP computing.

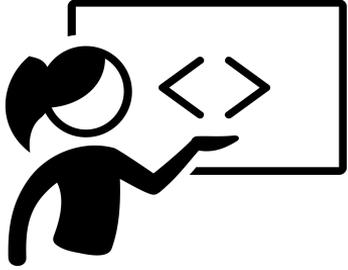
## **A problem I'm grappling with:**

How to combat unmaintainable complexity

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

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



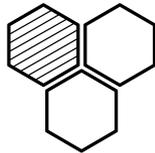
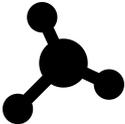


# Alja Mrak Tadel

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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 want to know more about:

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# 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](mailto: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:

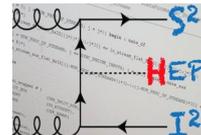
Physics prospects of the High-luminosity LHC upgrade and the software & computing challenges for that era. Visualization as a research tool. Machine learning applications for HEP. Analysis preservation and reuse.

## 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



Open Science Grid



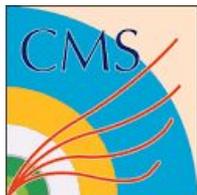


# Harvey Newman

*Professor of Physics, Caltech [newman@hep.caltech.edu](mailto: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

## **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



# Bill Nitzberg

CTO, PBS Works, Altair  
[nitzberg@altair.com](mailto:nitzberg@altair.com)  
[@billnitzberg](https://twitter.com/billnitzberg)

## My research:

Published on distributed shared memory, parallel I/O, PC clustering, job scheduling, and cloud computing. Served on Open Grid Forum board, edited MPI-2 I/O standard, and co-architected NASA's Information Power Grid. In my spare time, I try to reduce my pack weight for my long- distance hiking trips.



# Altair



PBS Professional  
Open Source Project

## My expertise is:

Job Scheduling & Resource Management for  
Clusters & Clouds  
Open Source Software and Standards

## A problem I'm grappling with:

Nurturing the PBS Pro Open Source community ([www.pbspro.org](http://www.pbspro.org)) to leverage effort and bring together innovations from traditionally separate HPC groups; simply... work better together.

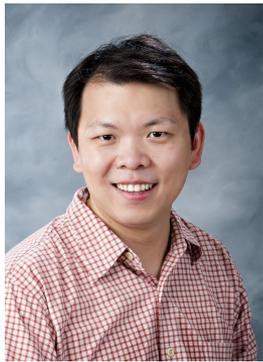
## I've got my eyes on:

HPC, HTC, Clouds, Big Data, ... too many things to fit here...

## I want to know more about:

Workflows and scheduling needs in all domains





# Nan Niu

Assistant Professor  
EECS, University of Cincinnati  
[nan.niu@uc.edu](mailto: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

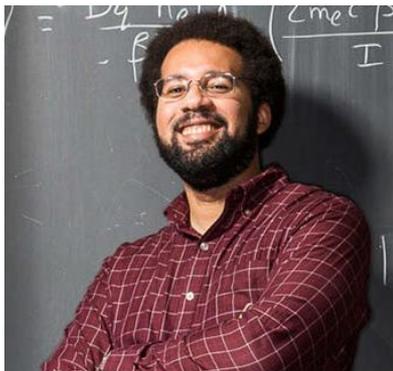
## I've got my eyes on:

Reducing developers' information needs in 'social coding'

## I want to know more about:

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





# Peter Onyisi

Assistant Professor, University of Texas at Austin  
[ponyisi@utexas.edu](mailto:ponyisi@utexas.edu)

## My research:

Higgs physics (and other things) at the LHC. Manager of ATLAS data quality monitoring development.



## My expertise is:

Running Tier-3s in clouds; LHC software on “non-standard” x86 systems

## A problem I’m grappling with:

Training neural nets to reproduce probability density functions for matrix element analyses

## I’ve got my eyes on:

Monitoring in multithreaded HEP frameworks

## I want to know more about:

Scenarios for making best use of special resources (e.g. Xeon Phi)

Reliable execution & data propagation





# Abid Patwa

*U.S. Department of Energy  
Office of High Energy Physics  
Program Manager for HEP Energy Frontier Program and  
U.S. LHC Operations Program  
[abid.patwa@science.doe.gov](mailto:abid.patwa@science.doe.gov)  
<https://science.energy.gov/hep/>*

## **My research:**

Program Manager for DOE HEP Energy Frontier;  
Program Manager for DOE U.S. LHC Operations Program

## **My expertise is:**

Program Manager for Energy Frontier in the U.S., focusing on management of U.S.-led efforts on ATLAS and CMS: in research, detector operations and computing.

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

Support of U.S. LHC program under tight fiscal constraints

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

Understanding the computing model and cost structure for future computing needs in Run 3 and HL-LHC operating era

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

Needs for computing (tape/disk, CPU, personnel resources) during HL-LHC operations



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Office of  
Science





# Jim Pivarski

*DIANA-HEP team member at Fermilab's LPC  
Princeton University*  
[pivarski@fnal.gov](mailto: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.

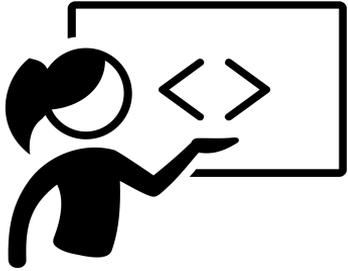
## I've got my eyes on:

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

## I want to know more about:

High performance computing.



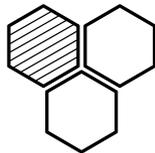
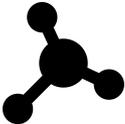


# Rob Quick

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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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# Nathalie Rauschmayr

*Cofund Fellow, CERN IT Department, IT-CF-FPP  
Currently working as Visiting Scientist at Lawrence  
Livermore National Laboratory (LLNL),  
Center for Applied Scientific Computing (CASC)  
rauschmayr1@llnl.gov  
nathalie.rauschmayr@cern.ch*

## **My research:**

My work focuses on performance optimization and the development of performance analysis tools for WLCG. At LLNL my work focuses on development of a scalable approach to measure and identify Memory Access Patterns.

## **My expertise is:**

HEP software, performance tuning, performance monitoring, High Performance Computing

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

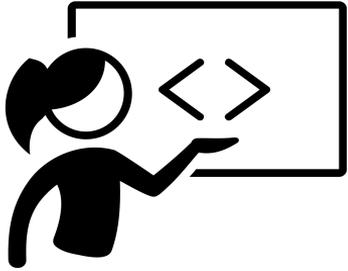
How to obtain meaningful performance information from large software frameworks without huge overhead and without generating TBs of data and how to analyse such data efficiently.

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

Everything related to performance analysis, Big Data, Deep Learning.

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

How HEP could profit from work/research undertaken within the HPC community and how to create more synergies between both communities.

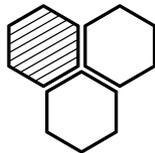
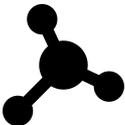


# Paul Rossman

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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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# Aaron Sauers

*Patent & Licensing Executive, Fermilab  
Federal Laboratory Consortium Executive Board,  
Laboratory and Business Systems committee chair*

## **My research:**

I handle intellectual property for Fermilab.

## **My expertise is:**

My expertise is technology transfer, with a focus on software.

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

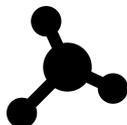
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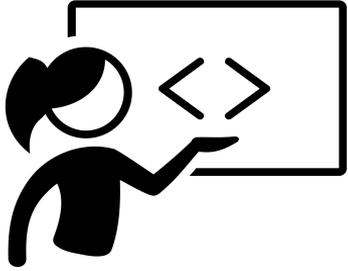
## **I've got my eyes on:**

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

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





# Markus Schulz

*Senior Applied Physicist at CERN IT*  
*Markus.schulz@cern.ch*

## **My research:**

Understanding the efficiency of LHC computing at all levels to contribute to the effort to bridge the resource gap for HL-LHC.

## **My expertise is:**

Distributed Computing, Grid Computing, Storage Systems, Data Management, Real Time Computing, Trigger, DAQ, Computer Architecture

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

Cycle scavenging on storage systems, performance measurement of event generators

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

Everything from detector upgrades to compiler changes and FPGA based accelerators.

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

How we can adapt our programming and data models to the future computer and systems architectures with (much) higher efficiency than our current approach.



# Ariel Schwartzman

*Associate Professor of Particle Physics and Astrophysics, SLAC, Stanford University*

## **My research:**

Understanding the Higgs boson and searching for new particles and forces with the ATLAS Experiment at the LHC. Application of computer vision and image processing to the analysis of LHC data. High Granularity Timing Detector.

## **My expertise is:**

VBF Higgs physics, SUSY, Jets and jet substructure, b-tagging, pile-up mitigation.

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

Image based event reconstruction at the LHC. Integrated space-time pattern recognition using high precision timing detectors.

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

Image recognition, weak supervision.

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

Ways to collaborate with the computer science community to explore new ways to analyze data from the LHC.

**Stanford** | Stanford Data Science Initiative





# Horst Severini

*Associate Director, OU Supercomputing Center for  
Education and Research (OSCER)  
Research Scientist, High Energy Physics Group  
University of Oklahoma*

## **My research:**

Distributed Computing, High Performance and High  
Throughput Computing

## **My expertise is:**

Distributed Computing sites, HPC clusters,  
particularly for ATLAS Tier2 computing

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

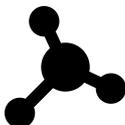
Standardizing OSG Middleware to generic HPC  
clusters

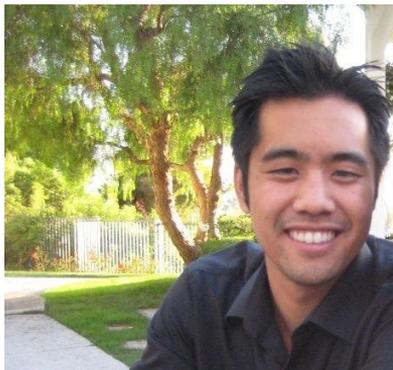
## **I've got my eyes on:**

Future computing

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

Machine Learning





# Michael Sevilla

*Graduate student, computer science  
UC Santa Cruz  
msevilla@soe.ucsc.edu*

**My research:**  
Distributed File Systems

**My expertise is:**  
Load balancing file system metadata

**A problem I'm grappling with:**  
Understanding the overheads of traditional metadata protocols and figuring out how to relax them

**I've got my eyes on:**  
Programmable file systems that support different degrees of consistency/fault tolerance within the same namespace.

**I want to know more about:**  
What the application needs from the file system namespace including scalability requirements and consistency guarantees





# 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.



# 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 S12 program (for DIANA-HEP -- data intensive analysis tools and the S212 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.





# Graeme Stewart

## My research:

ATLAS Software Coordinator

## My expertise is:

Managing software development in the collaboration. Core software and infrastructure.

## A problem I'm grappling with:

Getting our code multithreaded and the challenges of HL-LHC.

## I've got my eyes on:

Improving the methods we use to write software. How to get better code that graduate students can write.

## I want to know more about:

Architectures, compilers and optimisation tools.



# Ian Stockdale

*Engineering Manager, Altair Engineering.*

## **My research:**

Software Quality Engineering for distributed systems software.

## **My expertise is:**

SQE for distributed systems software. Software development methodologies in product development.

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

Supporting OSS participation in enhancing PBS.

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

Integrating workload managers with the cloud.

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

Opportunities for collaboration between Altair and the HEP community on new computing models.



Altair



PBS Professional  
Open Source Project



# Matevž Tadel

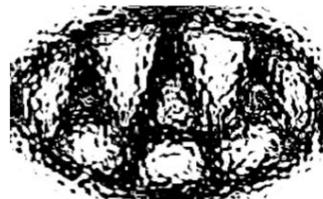
*Project Scientist at UCSD  
CMS*

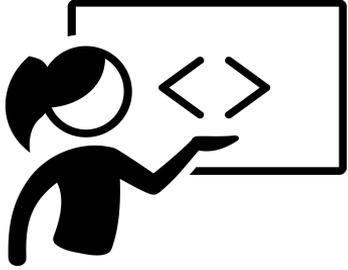
## **My research:**

- Vectorization & Parallelization of Track finding
- Optimization and performance tuning
- Data visualization & interaction
- Remote data access & Caching



**XRooT**D



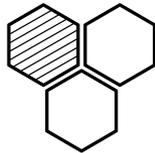
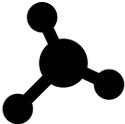


# Anyes Taffard

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bottom) by right clicking and selecting “replace image...”.  
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automatically resize your image to fit the template.>

## My research:

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anything you like!). You can add more, or delete them.>



## 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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# Karen Tomko

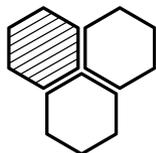
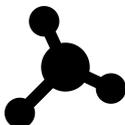
Director of Research Software Applications  
Ohio Supercomputer Center

[ktomko@osc.edu](mailto:ktomko@osc.edu)

(614) 292-1091

## My research:

My research interests include communication runtimes, application parallelization and tuning, and programming models for many-core coprocessors and accelerators.



## My expertise is:

Performance tuning of scientific software.

## A problem I'm grappling with:

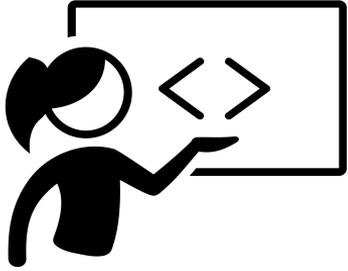
Maintaining 150+ software packages on 3 production clusters with heterogeneous resources

## I've got my eyes on:

Tools that help in the deployment of software for science on shared systems, such as easybuild, xalt

## I want to know more about:

The HEP software stack

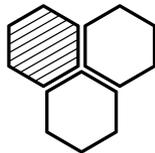
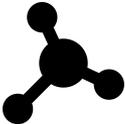


# Konstantin Toms

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## **My research:**

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## **My expertise is:**

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## **A problem I’m grappling with:**

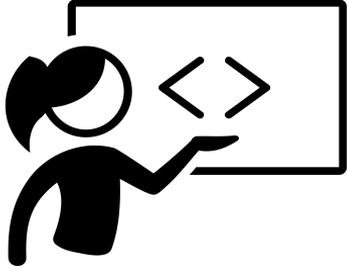
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## **I’ve got my eyes on:**

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

*<All text can be replaced, but for consistency we  
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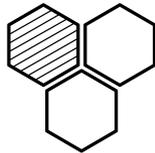
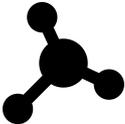


# Vakho Tsulaia

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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:

<All text can be replaced, but for consistency we  
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# 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.>





# Jean-Roch Vlimant

*Postdoctoral Scholar  
California Institute of Technology*  
[jvlimant@caltech.edu](mailto:jvlimant@caltech.edu) skype *jean-roch.vlimant*

## **My research:**

Intelligent software  
distributed computing  
deep learning



## **My expertise is:**

Particle physics, software  
design-management-development-operation,  
data triggering-reconstruction-analysis

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

Novel charged particle tracking  
Distributed computing optimization  
Deep learning applications

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

Deep learning, artificial intelligence, cognitive  
computing, high performance computing,  
networking

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

Control theory and practical applications



# Ilija Vukotic

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

AI, non-ROOT event data storage/analysis



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# Noah Watkins

*Graduate student, computer science*

*UC Santa Cruz*

[jayhawk@soe.ucsc.edu](mailto:jayhawk@soe.ucsc.edu)

## **My research:**

Large-scale distributed storage systems

## **My expertise is:**

Designing storage interfaces for domain-specific applications.

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

Cost models for push-down / remote computation in storage systems.

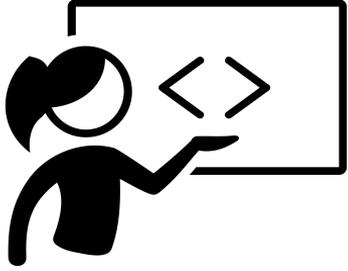
## **I've got my eyes on:**

A language for safely expressing dynamic storage interfaces.

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

Applications, their storage requirements, and opportunities for co-design.



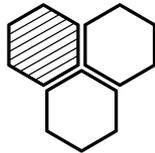
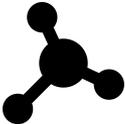


# Torre Wenaus

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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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recommend the headings remain.>



# Sandro Wenzel

*CERN computing staff*  
*ALICE experiment*  
*sandro.wenzel@cern.ch*

## **My research:**

ALICE Offline software stack  
Software and algorithm optimization in HEP  
Applying vectorization in Simulation/Reconstruction

## **My expertise is:**

High Performance Computing, C++, (Portable)  
Vectorization, Simulation Geometry Tracing,  
Static Code Analysis

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

How can we benefit from vectorization in  
digitization?

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

Tools, Tracking, Messaging

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

Machine Learning



**ALICE**





# Daniel Whiteson

*Professor of Physics, UC Irvine  
ATLAS experiment*

## **My research:**

Searches for new physics with ATLAS  
Machine learning for HEP  
Cosmic rays with smartphones (CRAYFIS)

## **My expertise is:**

Finding ML hammers for HEP nails

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

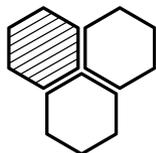
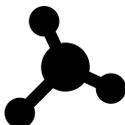
How to get HEP to stop reinventing wheels

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

Many new innovative ideas in ML

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

Everything





# Nancy Wilkins-Diehr

*Associate Director, San Diego Supercomputer  
Center  
co-PI NSF XSEDE project  
PI NSF Science Gateways Community Institute*

## **My research:**

Managing large, distributed cyberinfrastructure projects.

**XSEDE**

Extreme Science and Engineering  
Discovery Environment

**SGCI**

Science Gateways  
Community Institute

## **My expertise is:**

Managing large, distributed cyberinfrastructure projects.

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

Excitedly launching the Science Gateways Community Institute

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

Building the visibility of science gateways

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

The needs of the high energy physics community related to web interfaces to advanced cyberinfrastructure.

**SDSC**  
SAN DIEGO SUPERCOMPUTER CENTER



# Mike Williams

*Assistant Professor of Physics, MIT*

## **My research:**

Searching for dark photons and other hidden-sector physics, and studies of QCD phenomenology at LHCb.

## **My expertise is:**

Phenomenology, trigger algorithms and software, machine learning.

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

How to best exploit a triggerless readout system to search for hidden-sector physics in Run 3 at LHCb.

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

Cutting-edge developments in machine learning and other data science areas, and how they can be applied to HEP problems.

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

Everything.





# Justin M Wozniak

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

<http://www.mcs.anl.gov/~wozniak>  
[wozniak@mcs.anl.gov](mailto: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

swift →→



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# Wenjing Wu

*Associate Professor, Computer Center, Institute of High  
Energy Physics, Beijing, China  
ATLAS experiment*

## **My research:**

Distributed computing(Volunteer Computing), massive  
storage systems

ATLAS@home project

## **My expertise is:**

Volunteer computing, and distributed computing  
for HEP experiments include ATLAS, BelleII,  
BESIII

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

Apply volunteer computing to the computation of  
HEP experiments, and bridge it to the distributed  
computing platform of HEP experiments.

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

Distributed computing

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

Event services in HEP software



中国科学院高能物理研究所

Institute of High Energy Physics Chinese Academy of Sciences





# 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:**

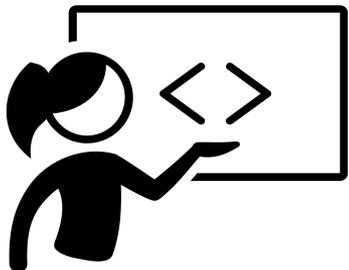
How to integrate CI across institutions and science teams at all scales and business models, from single PI to large international experiments, from small colleges to national labs, covering sharing, allocations, and commercial cloud.

## **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.

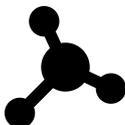


Avi  
Yagil

**Professor of Physics, UCSD**

**My research:**

- Search for new physics with CMS
- Explore new tracking algorithm (tracking) for HL
- Develop tracking for Multi-Core based computing
- Trying to see if we can be of help to medics/patients in their (non)usage of data...



**My expertise is:**

None

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

How do we maintain the essential customization in our experiment-specific code development while maximizing resource utilization?

Or

How do we avoid a one-size-fit-all non-performant compromise?

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

Containing computing costs for HL-LHC while preserving Physics performance

**I want to know more about:**

Too many things to list...

