



Connecting the Dots 2022

Intro/Info slides

David Lange (Princeton University)
for the local and international organizers

Welcome

- Thank you for attending a much belated Connecting The Dots workshop at Princeton University (in person or via zoom)
- We hope that CTD is scientifically and socially engaging for everyone
- I have some brief slides of introduction and logistics.
 - For all the logistical issues I miss, please ask any of the Princeton team (or just after this talk)

Today is a Princeton Staff holiday

- Not scheduled when we set our dates. Doubtful that we would have included this possibility in our risk registry if we had made one..
- Hopefully everything goes as planned as there is little on-site support from campus services today. Back to “normal” (or at least the new normal) tomorrow..
- Thanks to Andrea and Floe for sticking with us today!

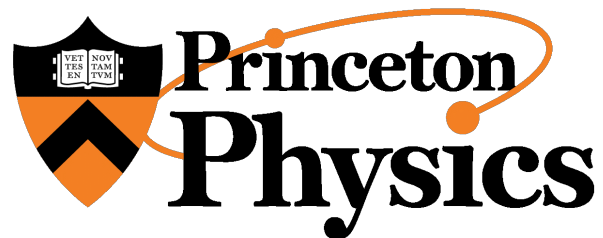
Introduce yourself

- If you have not already done so, please add a slide to introduce yourself to these slides:

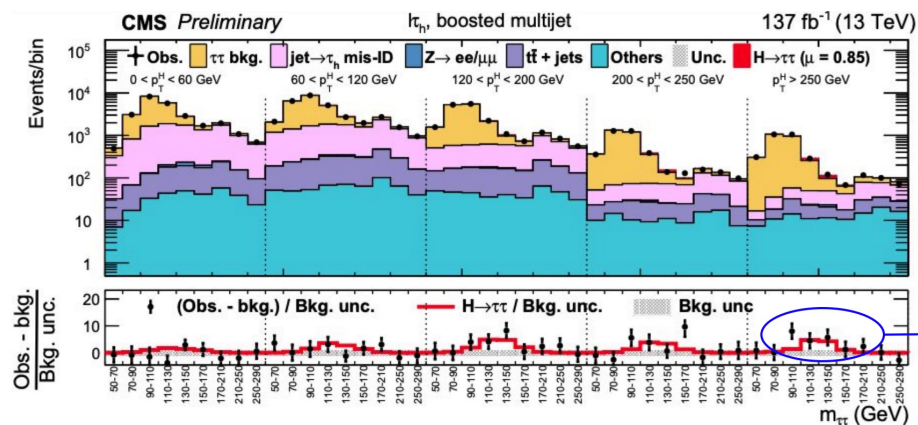
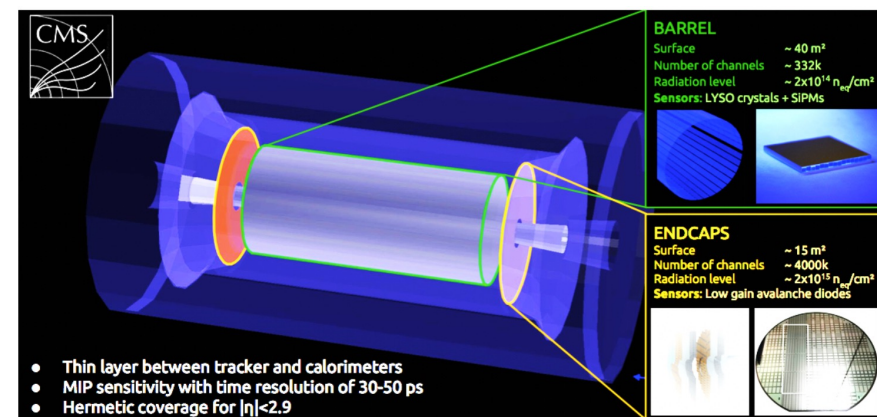
<https://docs.google.com/presentation/d/1EIKYV6mobkvH78gikZ1vjr54pDc1RyCccSic28JBKfU>

and thank you to everyone that did already!

Who we are?



- Areas of research in the department include fields of high energy; condensed matter; mathematical, biological and nuclear physics; and astrophysics.
- More than a dozen Nobel Prizes have been awarded to faculty and students of the Department
- More than 30 researchers (4 faculty) involved CMS
 - Involved in number of different facets
 - Higgs physics and BSM physics,
 - Luminosity instrumentation and measurement
 - Calorimetry and L1 Trigger
 - HL-LHC upgrade projects include outer tracker production, MIP timing detector, calorimeter trigger firmware design, and software/computing



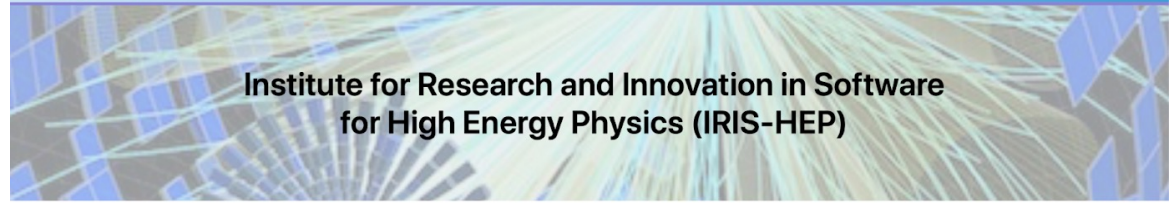
Who we are?



Princeton
Research Computing

- The Princeton Institute for Computational Science and Engineering (PICSciE) is an interdisciplinary institute
 - Created in 2002 by a group of faculty interested in developing an institute in computational science in collaboration with the Princeton University administration, PICSciE has grown to include membership from the engineering and science departments, social sciences and humanities on campus as well as with the Princeton Plasma Physics Laboratory (PPPL) and the Geophysical Fluid Dynamics Laboratory (GFDL).
- PICSciE provides educational and training opportunities, research software engineering as well as state-of-the-art computing and visualization facilities in collaboration with the Office of Information Technology's Research Computing, academic departments, and institutional partners.
- The IRIS-HEP software institute (PI: Elmer) is headquartered in PICSciE.

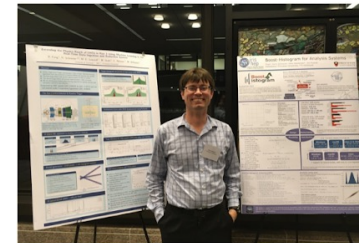
IRIS-HEP: Institute for Research and Innovation in Science for High Energy Physics



Computational and data science research to enable discoveries in fundamental physics

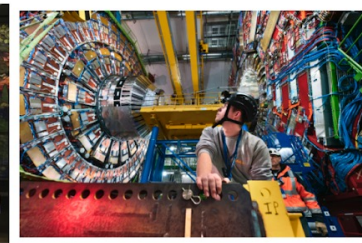
IRIS-HEP is a software institute funded by the National Science Foundation. It aims to develop the state-of-the-art software cyberinfrastructure required for the challenges of data intensive scientific research at the High Luminosity Large Hadron Collider (HL-LHC) at CERN, and other planned HEP experiments of the 2020's. These facilities are discovery machines which aim to understand the fundamental building blocks of nature and their interactions. [Full Overview](#)

News and Featured Stories:



Team Member Spotlight: Henry Schreiner
Highlights the work of Henry Schreiner, a computational physicist and research software engineer with IRIS-HEP.

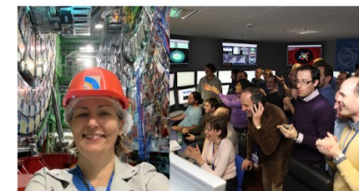
[Read more](#)



Deep learning, fast hardware to drive search for new physics

Fast electronics and artificial intelligence are helping physicists capture data and decide what to keep and what to throw away.

[Read more](#)



Building a career path for research software engineers

Software is now fundamental to scientific research. Until recently, the people who build it



High-energy physics opens its doors to the exabyte era

As the high-energy physics community prepares for the High-Luminosity LHC, new data science

Upcoming Events:

No events currently scheduled. Check back again soon!

[View all past events](#)

Upcoming Topical Meetings:

- Sep 20, 2021
IRIS-HEP Fellow presentations
- Sep 22, 2021
DIANA/HEP Fellow presentations
- Sep 27, 2021
IRIS-HEP Fellow presentations
- Sep 29, 2021
IRIS-HEP Fellow presentations
- Oct 4, 2021
DIANA/HEP Fellow presentations
- Oct 6, 2021
IRIS-HEP Fellow presentations
- Oct 13, 2021
DIANA/HEP Fellow presentations
- Oct 18, 2021
IRIS-HEP Fellow presentations
- Oct 25, 2021
IRIS-HEP Fellow presentations
- Oct 27, 2021
IRIS-HEP Fellow presentations

[View all](#) • [Indico \(recordings\)](#)

Related projects:

ATLAS • CMS • LHCb • USATLAS • U.S. ATLAS Operations Program • USCMS • U.S. CMS Operations Program • OSG • PATH • SOTERIA • SciAuth • EWMS • SCAILFIN • SLATE • VC3 • DIANA/HEP • TrackReco • SSE ML@LHCb • Compiler Research • PONDD • FIRST-HEP • CoDaS-




- IRIS-HEP is supported by the U.S. National Science Foundation through the **Office of Advanced CyberInfrastructure** in the Directorate for Computer and Information Science and Engineering and the Division of Physics in the Directorate for Mathematical and Physical Sciences.
 - Funded by a program with a focus on developing sustainable science-driven software as cyberinfrastructure.
- Software is only a tool, but also an intellectual product itself.


Getting oriented

▾ Add layer + Share 👁 Preview

Basic info

 Individual styles

 Jadwin Hall (Workshop locati...

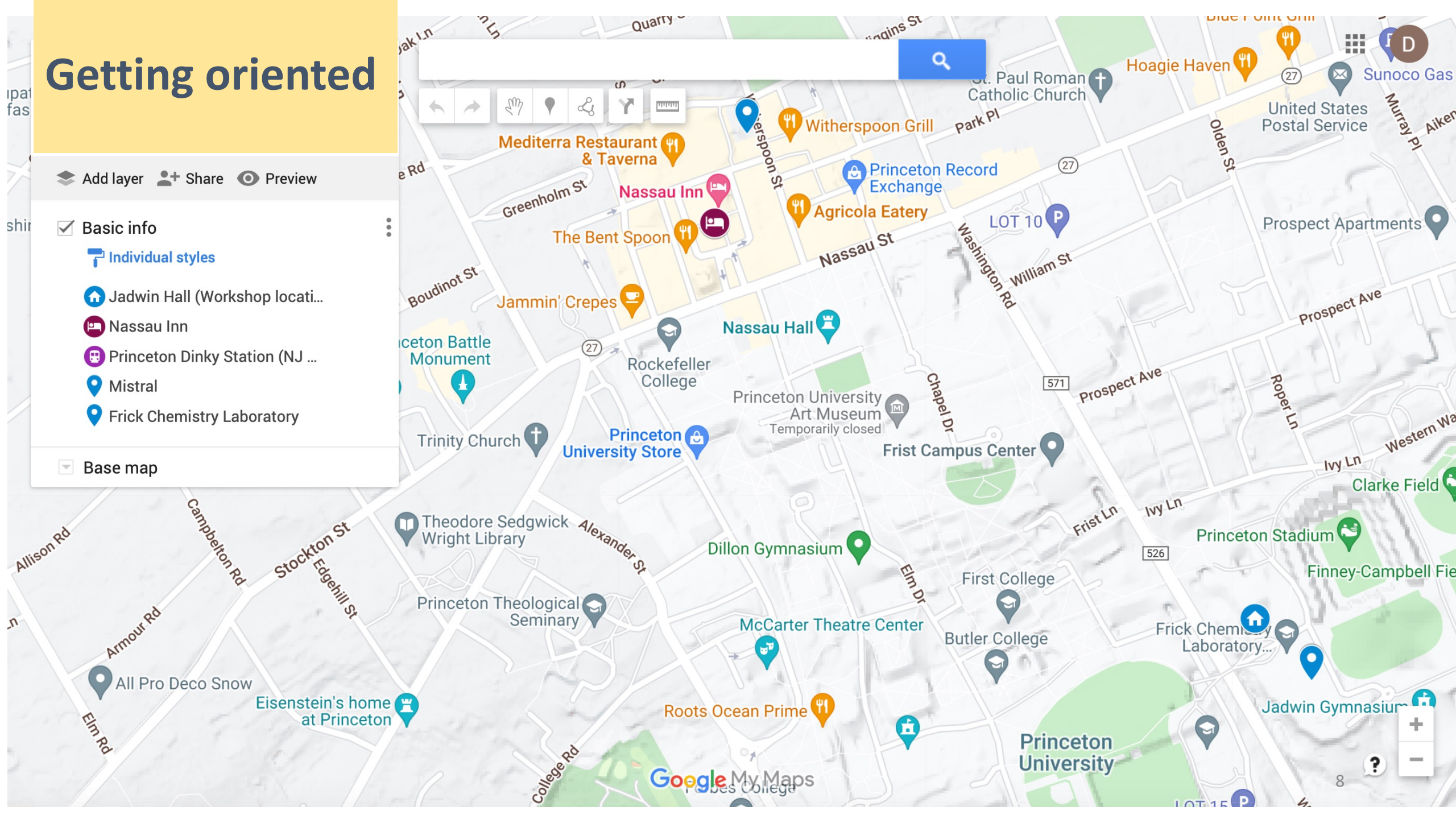
 Nassau Inn

 Princeton Dinky Station (NJ ...

 Mistral

 Frick Chemistry Laboratory

Base map

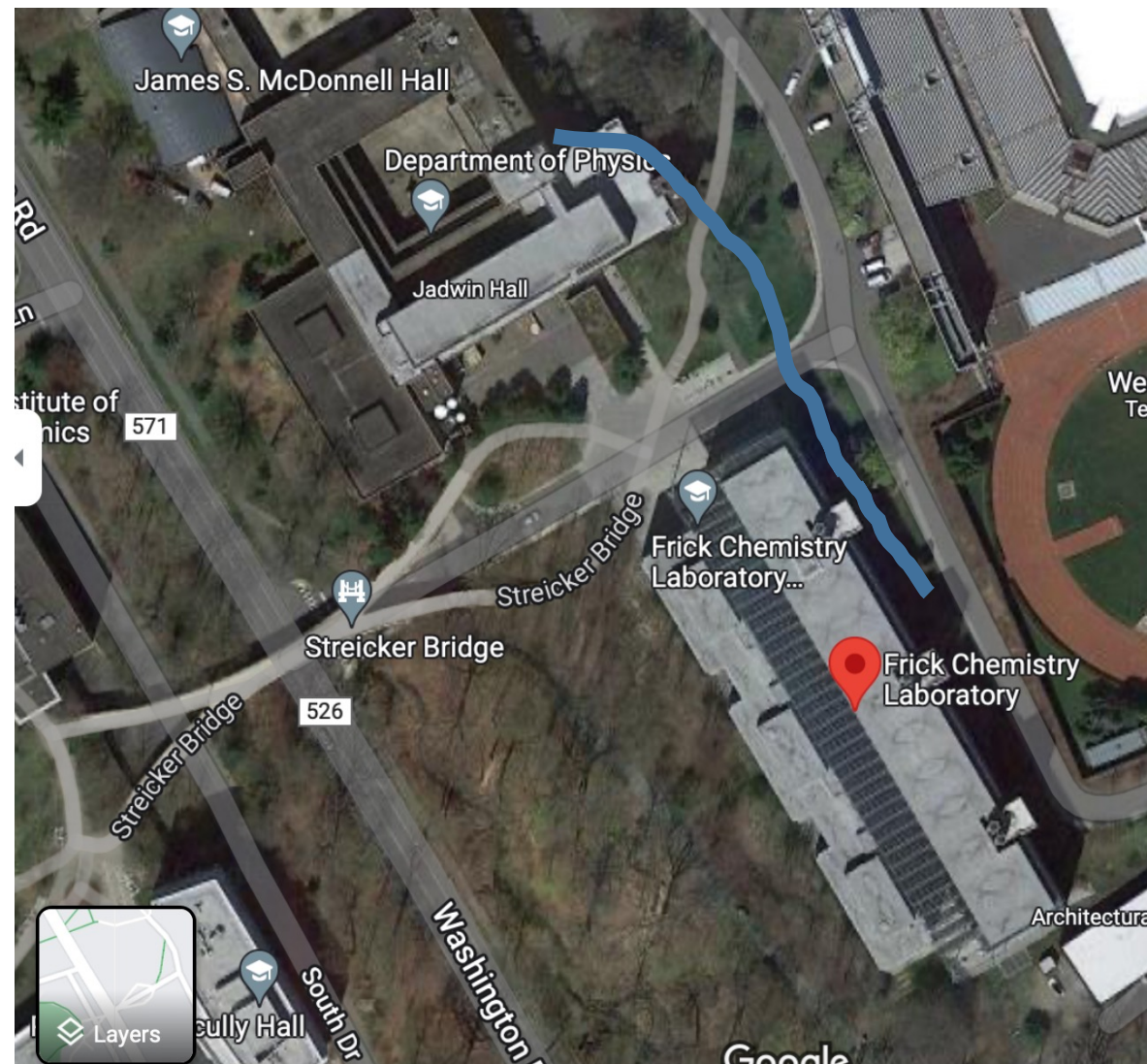


Breaks

- Breakfast 8:30 (also for the GNN workshop)
- Lunches provided
- Reception tonight, dinner tomorrow (19:00 – more details to follow)
- There is currently a tent outside Jadwin. It might be removed at some point (not likely today as it's a holiday...). We can make use of that if its not being used for something else
 - In any case there is lots of covered shadow and some tables/chairs outside of Jadwin Hall

Posters and Reception

- When: Tonight after the last plenary session (eg, 18h30)
- Where: Outside of Frick lab (next to Jadwin). In case of bad weather, we will move just inside the patio area
- Watch for introductions to each poster during the session today



Join the June 3 GNN workshop

- Register here (190 already signed up...) <https://indico.cern.ch/event/1128328/>
 - Same in person venue.
 - Agenda runs from 9-3 EDT. More discussion oriented than CTD.

Mini-workshop on Graph Neural Networks for Tracking

June 3, 2022
Princeton University
US/Eastern timezone



Overview

Registration

Participant List

Graph networks show great promise for HEP tracking on detectors ranging from silicon trackers to LAr TPCs. As the demonstrators are applied to increasingly realistic datasets, they face computing and physics performance challenges. This workshop aims to discuss these challenges and new ideas to address them. The list includes (but is certainly not limited to)

- Size/purity/efficiency tradeoff for the graphs presented as input to the GNNs
- Parallelization strategies for tracking graph networks (Region of Interest tracking, geometric partitioning, etc.)
- Graph (and model) compression, pruning, partitioning for online applications
- Model resilience to detector effects (noise, alignment, etc.) and new physics domains (e.g., large radius tracking).
- Heterogeneous graph networks operating on multiple detector types and at multiple abstraction levels (e.g., channel, cluster, view, track, particle)
- Physics-informed models incorporating symmetry constraints, etc.
- Object condensation, instance segmentation, and other approaches to extract directly track parameters
- Graph-level inference for event classification

Locks

- Since COVID, campus buildings are locked.
 - Ask a Princeton person to let you in, or do not hesitate to text us to do so. We hope to avoid anyone being stuck outside, and apologies in advance if you end up that way.
 - There is a sign on the door in case you lose our contact info.

Covid

- Lets take what precautions we can to reduce the risk of Covid spread during CTD.
 - As in person conferences restart, some are proving to be super-spreader events (notably PyCON as well as a previous workshop at Princeton)
 - Tests are available (we have about 80) and are encouraged
 - The ventilation in the room is quite good and we are watching CO2 levels
- We can take advantage of the nice weather during breaks and evening events.

Hybrid mode questions

- We encourage you to use schnaq for questions. Find it via
 - The corresponding Indico contribution materials (“Questions”)
 - For those locally, the TV screen to my right has the URL info as well as the questions being asked
 - In principle, Schnaq allows Q/A followups and chat discussion. Speakers are encouraged to use it.
 - You can be “anonymous” or include your name. In addition, you can create an account (using your github,google, etc), to enable notifications
 - Schnaq is an experiment, if it doesn’t go well today, we may change tomorrow to help the discussion in hybrid mode...
- We will also take Q/A from zoom/audience.

Hybrid mode questions

Questions for "CTD 2022 Introduction"

Share Export English Overview Upgrade Anonymous

Newest All Statements Answered Unanswered Questions Search for...

David Lange 2 minutes ago 0 Posts
Questions for "CTD 2022 Introduction"

Anonymous
Your statement / question Post

Ask a question here


Set your name here if you want to

Find link to questions via Indico, participation code or Q/R code projected locally


Participation code:
9893 2143







Invite more people by navigating to <https://schnaq.app> and entering the code there.


Hybrid mode questions





Questions for "CTD 2022 Introduction"









Newest All Statements Answered Unanswered Questions Search for... 





David Lange 2 minutes ago  1 Posts


Questions for "CTD 2022 Introduction"






Anonymous


Your statement / question 





Anonymous less than a minute ago 


Can I respond to a question from another attendee?

 0  0  1 more post





Your statement / question 

Hide posts 



Anonymous less than a minute ago 

Yes!

 0  0  0 

Respond to a question here

Proceedings

- CTD workshops traditionally have peer reviewed proceedings.
- We hope that everyone is interested in further documenting their results via a short proceedings publications
- More information on Wednesday

Questions?