Workshop on Machine Learning for Analysis of High-Energy Cosmic Particles

Welcome

Frank Schroeder

Clayton Hall, Newark, DE   28 Jan 2025

Workshop Organization

Workshop follows a previous workshop in Jan 2022 on machine learning for air showers, and.
extends scope to machine learning for all types high-energy cosmic particles:

- Cosmic rays
- Neutrinos
- Gamma Rays
- → Overlap in detection techniques and data analysis methods

83 registered participants (about half of them remote) from 11 U.S. states, 12 countries in 5 continents

Hybrid workshop, in person and on Zoom:
https://udel.zoom.us/j/95973268137?pwd=hLILB0Qsaxu80XxDWXxxbKbYwJqfty.1

Workshop Committee

Frank Schroeder	Marcos Santander
Spencer Axani	Serap Tilav
Matthias Plum	Xinhua Bai

NSF EPSCoR Support

Workshop idea born out of the IceCube EPSCoR Initative (IEI), a collaborative grant between IceCube and IceCube-Gen2 institutions in EPSCoR jurisdictions:
NSF award # 2019597 RII Track-2 FEC: The IceCube EPSCoR Initiative (IEI) - IceCube and the Data Revolution

This workshop is generously supported through
NSF award # 2336900 Conference: EPSCoR Workshop on Machine Learning for Analysis of High-Energy Cosmic Particles

NSF EPSCoR provides support for: room, equipment, hotel, national travel, and other expenses
Support also includes a professional evaluation → more details after this talk

Other Support:

Bartol Research Institute provides supplementary support for expenses not covered otherwise.

Department of Physics and Astronomy: many thanks to Dawn Butler for help with organization!

Workshop Goals

- Bring together machine-learning experience on data analysis of cosmic particles from different detection techniques and for different primary particles → find synergies

- Show also work in progress and give opportunity to discuss failed approaches, ideas, questions, …

- Allow plenty of time for questions and for discussion during breaks.

Presenters:

- Please upload your slides the day before the talk and check them in a break before your talk.

Zoom participants:

- You can raise your hand for questions or use the chat for discussions. We will have a look to the chat in the questions time after each talk.

- Please switch on your camara when talking, we have a separate TV just for this purpose.

Schedule: Tuesday - Thursday

Time in EST (= UTC – 5)	Workshop Function
08:30 am	Breakfast
09:00 – 10:30 am	Talks
10:30 – 11:00 am	Coffee Break
11:00 – 12:30 pm	Talks
12:30 – 02:00 pm	Lunch Break
02:00 – 03:30 pm	Talks
03:30 – 04:00 pm	Coffee Break
04:00 – 05:30 pm	Talks

Dining:
- Small breakfast included
- Drinks and snacks during coffee break
- Lunch included
- Dinner on Tuesday + Thursday on your own
  → plenty of options on Main Street

Conference Dinner:

Wednesday 6:00pm at Café Gelato, Main Street

food + 2 drink tickets included in fee

https://events.icecube.wisc.edu/event/243/

Friday: for smaller follow-up meetings

Option for further, informal discussion on specific topics, experiments, …

One follow-up already scheduled for IceCube members

- Friday, 9am in Sharp Lab, room 215

→ If you are an IceCube member, let me know today whether you participate.

Other meetings welcome! Let me know today, if you have something in mind, and we can organize a room for you. Of course, you are also welcome to discuss on a walk, lunch, or in the lobby in small groups.

Proceedings on Zenodo

Slides and Abstracts are will be uploaded to Zenodo as an open-access proceeding of this workshop:

https://zenodo.org/communities/ml-workshop-bartol2025

After your talk:

- review your indico slides and abstracts, and confirm that they are good for upload

  - or make any modifications as needed, and then confirm that they are done

- Collin and Maeve will take care of upload

- Your contribution will get a DOI by which it can be cited

Bartol Research Institute
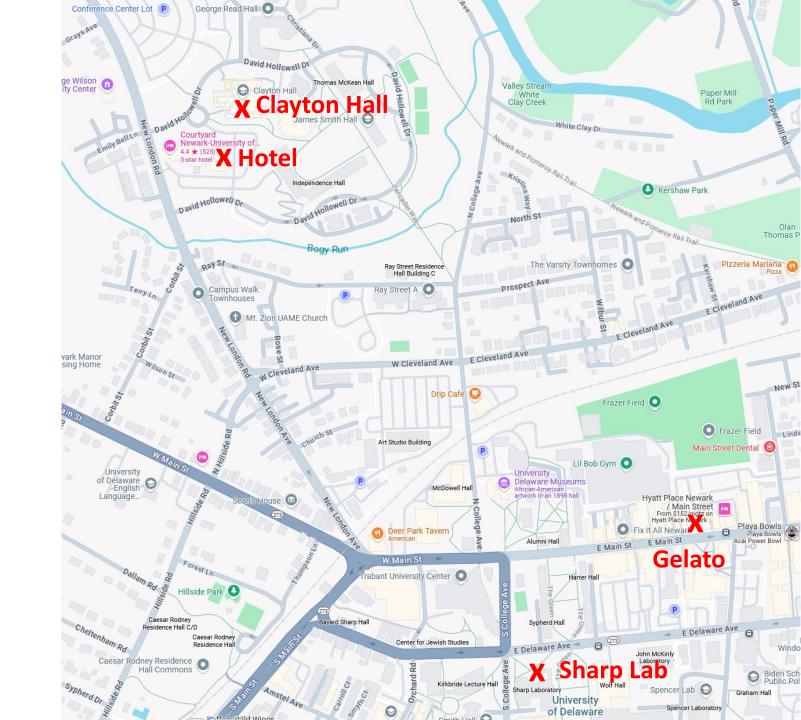# A Center in UD's Department of Physics and Astronomy

Sharp Lab

Workshop Site:

- Main workshop in Clayton Hall

- Dinner in Café Gelato on Main Street

    Wed., 6pm

- Friday for small/internal follow-up

    meetings in Sharp Lab

Free time activities:

- trail along creek close

- restaurants, bars, cinema, arcade, and

    escape room on Main Street

- few trains to major East Coast Cities,

    such as Philadelphia

- many other sights within driving range

Welcome in Newark Delaware

Welcome worldwide on Zoom

Any questions?

Maryann Durland, Ph.D.
315 Graham Street
Elkins, WV 26241
mdurland@durlandconsulting.com
630-650-9944

Applied Research & Evaluation2001

- 2001 – Current

- Types of Projects

  - DEXIS – subcontract – Department of State/Educational and Cultural Affairs - Evaluation of the TechGirls Program -social network analysis

  - CFIA – Canadian Food Inspection Agency - social network analysis as part of a larger evaluation

  - NLU/AUSL Chicago IL; Evaluation of 5-year project; Department of Education, Office of Elementary and Secondary Education; Teacher Quality Partnership Grant

  - Grand-Aides developed and wrote an online healthcare Curriculum & Assessment Training System - International

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- NSF IGERT SNA Evaluation; IGERT has been the National Science Foundation's flagship interdisciplinary training program, educating U.S. Ph.D. scientists and engineers by building on the foundations of their disciplinary knowledge with interdisciplinary training.

- Westat Social Network Analysis Evaluation of US Department of Education Project

- National Democratic Institute Social Network Analysis evaluation with SNA training – International Organization

- Program Evaluation 1st year NSF ADVANCE grant, Syracuse University, with SNA

- Science Chicago Program evaluation – Chicago

Evaluation Of The EPSCOR Workshop On Machine Learning For Analysis Of High-Energy Cosmic Particles

PURPOSE OF EVALUATION

- First demographic data will be collected on each participant (Survey 1)

- Second, at the end of the workshop, an exit evaluation to address

  - Overall satisfaction with the conference
  - Impact of Conference
  - Networking Opportunities
  - The Future

ANY QUESTIONS?