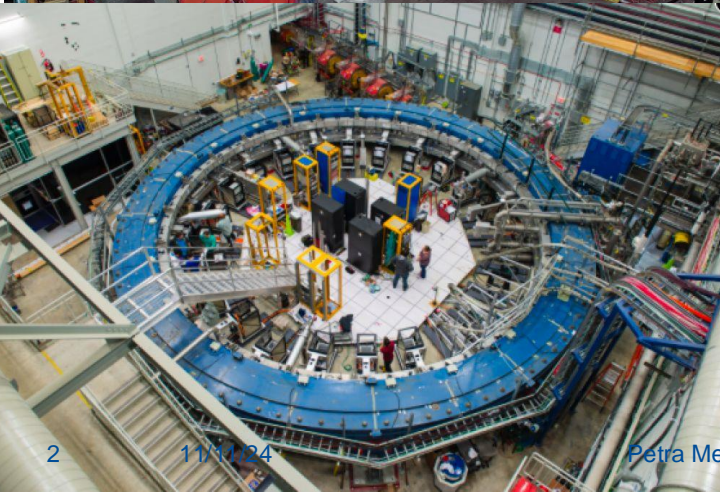
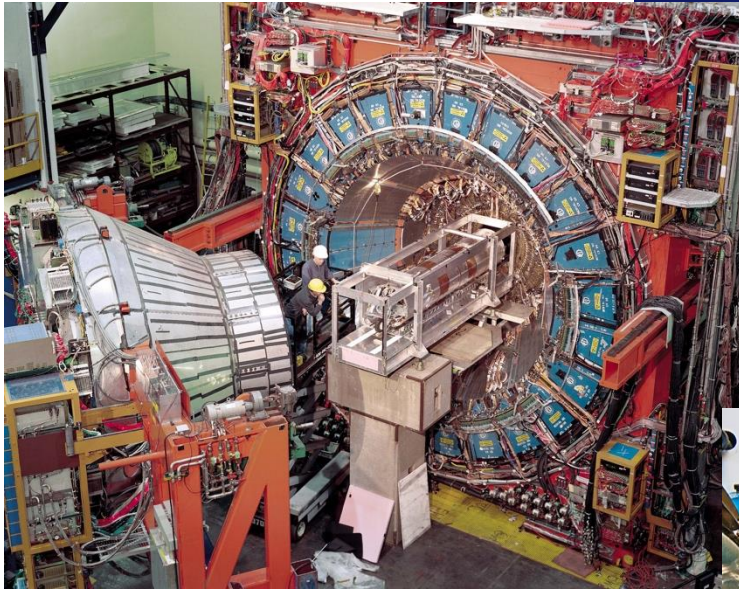




# Welcome to the 2024 EDIT School at Fermilab

Petra Merkel

November 11-22, 2024





11/11/24

Petra Merkel

Welcome to the 2024 EDIT School at Fermilab

# Format and Goals

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- **Day 1 (today):** some detector lectures, some hands-on training, badging, sorting out computing accounts, etc.
- **Days 2-9:** morning detector lecture, rest of the day hands-on exercise
- **Day 10:** campus tours, final lectures, and farewell party
  
- The **goal** is to give an an overview and some broad understanding of different detector technologies for HEP and to give you some hands-on experience in how to work in a lab to design and build these detectors.
  
- It is crucial to train the next generation of detector experts, especially with long gaps between experiments. Without detectors there is no science!

# Detector Lectures

The lectures will cover these topics:

- History of Particle Detection - Carl Haber (LBNL)
- Noble Element Detectors - Elena Gramellini (Manchester University)
- Silicon Tracking Detectors - Carl Haber (LBNL)
- Quantum Sensing and Controls - Aaron Chou (FNAL), Sara Sussman (FNAL)
- Photodetection - Flavio Cavanna (FNAL)
- Superconducting Detectors - Clarence Chang (ANL, University of Chicago)
- CCDs - Stephen Holland (LBNL)
- Calorimetry - Grace Cummings (FNAL)
- Data Acquisition Systems - Kristian Hahn (Northwestern University)
- Readout Electronics and ASICs - Ted Liu (FNAL)
- Applications outside HEP - Hyejoo Kang (Loyola University)
- Putting it all together - Steve Nahn (FNAL)
- Intelligent Detectors - AI on Detector - Nhan Tran (FNAL)



Week 1: One West (this room)  
Week 2: Hornet's Nest (WH8XO)

Big thank you to all the guest lecturers!

# Hands-on Classes

Please wear close-toed shoes each day, just in case!

- You will be split into 6 groups of 8 students each
  - Groups A-F, you can find your group on your “School ID” and on the next slide
- We organized 8 different hands-on days: each group will experience each of the days, but in different order

	Silicon Detectors - I	Silicon Detectors - II	CCD Detectors	CCDs + Thin Films	Scintillators + Photodetectors	Testbeam DAQ	Neutrino Detectors	Quantum Detectors
11/12	F	D	B	-	C	-	E	A
11/13	A	E	C	-	-	D	F	B
11/14	D	F	-	B	A	E	-	C
11/15	B	-	D	C	E	F	A	-
11/18	C	A	E	-	F	-	B	D
11/19	-	B	F	D	-	A	C	E
11/20	-	C	A	E	D	B	-	F
11/21	E	-	-	A + F	B	C	D	-

# Groups

<b>Group A</b>	<b>Group B</b>	<b>Groups C</b>
Akash Kafle	Akshaya Vijay	Alessandro Reineri
Alejandro Rodriguez	Beren Ozek	Alexis Mulski
Benjamin Pulver	Cheuk-Ping Wong	Isik Karslioglu
Blas Irigoyen Gimenez	Deeksha Sabhari	Jimmy Caylor
Emma Hess	Francesca Lenta	Lucian Fasselt
Gabija Ziemyte	Husheng Guan	Miqueas Ezequiel Gamero
Jacob Boza	Jordan Dias-Gaylor	Natalie Harrison
Jihee Kim	Keane Tan	Noah Knutson
<b>Group D</b>	<b>Group E</b>	<b>Group F</b>
Alexander Albert	Itzelli Salazar Segovia	Nayana Bangaru
Harshul Gupta	Marius Menzel	Oliwia Kaluzinska
Jinglu Wang	Pau Simpson	Robert White
Luis Mora-Lepin	Ran Chen	Shubham Pandey
Marie Mühlwinkel	Robert Snuggs Jr.	Thomas Braine
Nimmy Sarah Alex	Shikha Shikha	Tyler Horoho
Pierce Affleck	Theodora Efthymiadou	Umberto Follo
Ramneet Kaur	Yihui Lai	Yulun Miao

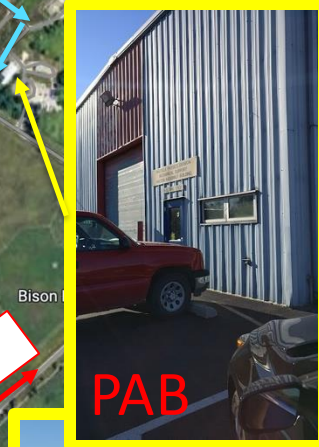
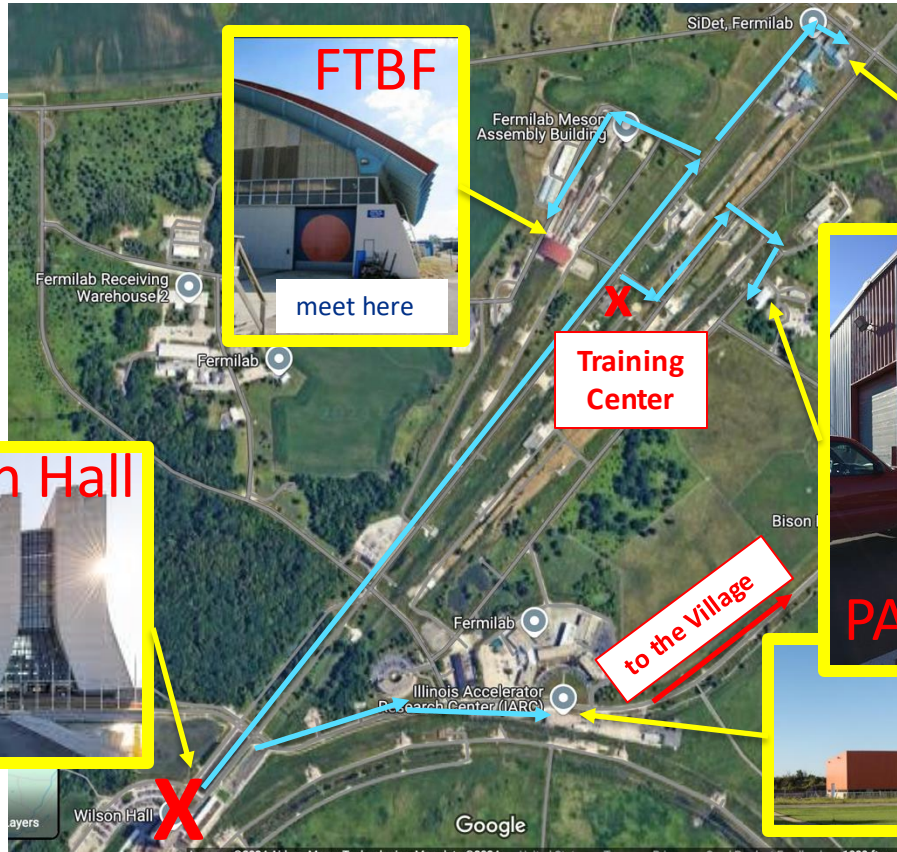
# Clarification on 'CCDs and Thin Films' Day

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- The 'CCDs and Thin Films' Day consists of two separate half days at two locations
  - **CCDs**: IERC
  - **Thin Films**: Lab 7 in the Village
- For this day only: split the group of 8 students into two: **first 4** (grey) and **second 4** (blue) – see slide 7
  - **Grey group** goes to **CCDs** in the morning and **Thin Films** in the afternoon
  - **Blue group** goes to **Thin Films** in the morning and **CCDs** in the afternoon
- On the last hands-on day (11/21) both groups A and F will be doing this together



# Locations



# Village Locations

**Thin Film – Lab 7**



**Scintillator Lab – Lab 6**



**from Wilson Hall**

**from the Hotel**

# Meeting Points

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- IERC: meet on WH Atrium level, to the right of the front doors, by the glass doors
- IARC: park to the right of the blue/glass building (closest to WH), enter there
- FTBF: meet by door as indicated in photo
- PAB: meet by front door closest to parking lot (there is a door bell looking like a light switch)
- SiDet: park off Eola Rd to the left of the geodesic dome; meet at main entrance
- Village Labs: addresses as indicated in photos; these need access keys, your badges won't work, just knock on the doors

# Tours

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- On the last morning, we will take you on tours of various experiments and labs across the campus:
  - SBND (Short Baseline Near Detector, Neutrino Experiment) – walk from WH
  - g-2 (Muon g-2 Experiment) – walk from WH
  - SQMS (Superconducting Quantum Materials and Systems Center) – shuttle from WH
- We will take turns so everyone can go on all three tours, except we are short a few spots for g-2
  - if you are local to Fermilab we would ask you to not go on the g-2 tour, instead we will organize another time slot after the school is over for this local group

# Last Day

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- In the morning, we will go on the tours (see previous slide)
- Then we have a lecture on how to get a large extremely complex experiment to work, how to integrate all the different technologies and sub-systems. This will be followed by the Wine and Cheese seminar on intelligent detectors.
  - the seminar is usually preceded by a gathering where wine and cheese is on offer and where the audience can chat before the seminar at the end of the week; it is currently not yet clear if we can have the W&C portion of the seminar, but the talk will go ahead in any case
- After the seminar we are organizing a farewell dinner party where we will conclude on the school, hand out certificates of participation, and hopefully have some fun. Location t.b.d.

# Miscellaneous Notes

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- The bus will depart every day from the Hampton Inn at 7:30 AM, please arrive early to board. The bus will arrive/depart from the front entrance of Wilson Hall (with all the flags). Evening pick up is at 5:15pm.
- To get around Fermilab, we have shuttles available for those that don't have their own transportation.
  - each group seems to have enough cars/drivers and hopefully we can do without the shuttles, which would add flexibility
- For lunch we all come back to Wilson Hall. Lunch will be just outside this room.
- Our group photo will take place today during our morning break at 10:45 AM in the Atrium.
- Badging appointments will take place this afternoon. We will divide into two groups to expedite the process.
- Restrooms are around the corner from our classroom, as are vending machines and water fountains.
- WiFi: Fermilab does have guest access; registration is required. [Fermilab | Network Services | Guest Wireless Self-Registration \(fnal.gov\)](#)
  - you can also use the fgz network or eduroam
- Lecture materials are posted on Indico, as is the current schedule.

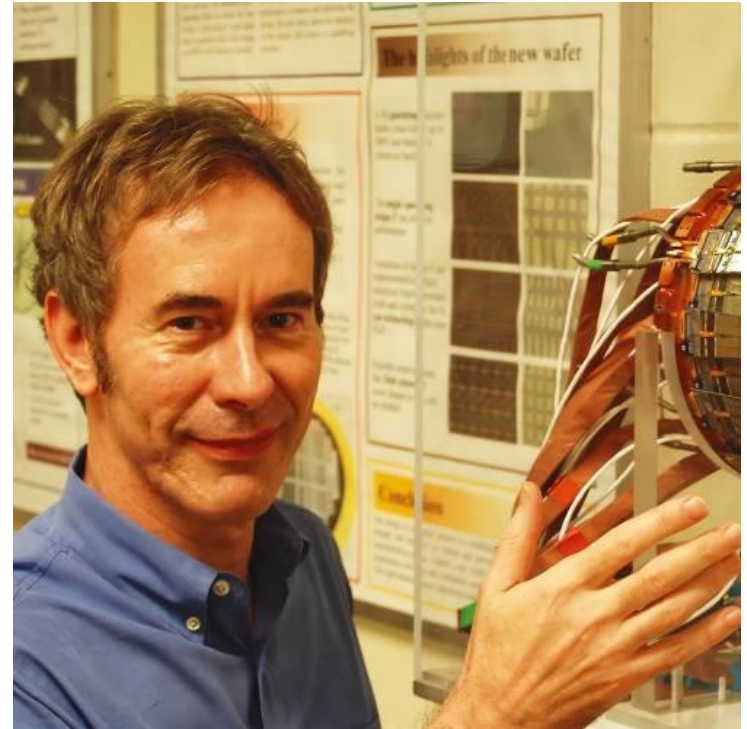
# Thanks!

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- A big thanks to...
  - Jessica and Anne for helping with the organization and campus access
  - all the lecturers
  - everyone who is helping with the hands-on exercises
  - the CMS admins for help organizing the lunches
  - Dee for helping with the trainings

# Tribute to Prof. Ian Shipsey (University of Oxford)

- Ian has been a passionate advocate for detector development for particle physics
- He has been a driving force of our community in the US and worldwide
- Ian has been chairing the ICFA IID (panel for detector instrumentation), which is the organizer of the EDIT School
- He has been a close friend and mentor, and he has passed away suddenly a month ago. He has left a very big hole in the detector community, and particle physics at large
- I would like to dedicate this school to Ian's legacy





And finally...

