



LINAC 2024

CHICAGO

AUGUST 25–30, 2024

WELCOME TO CHICAGO!

JOHN BYRD AND SAM POSEN

Argonne National Laboratory

Fermi National Accelerator Laboratory



Argonne National Laboratory is a
U.S. Department of Energy laboratory
managed by UChicago Argonne, LLC.



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The LINAC24 program looks fantastic!

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THANK YOU VENDORS

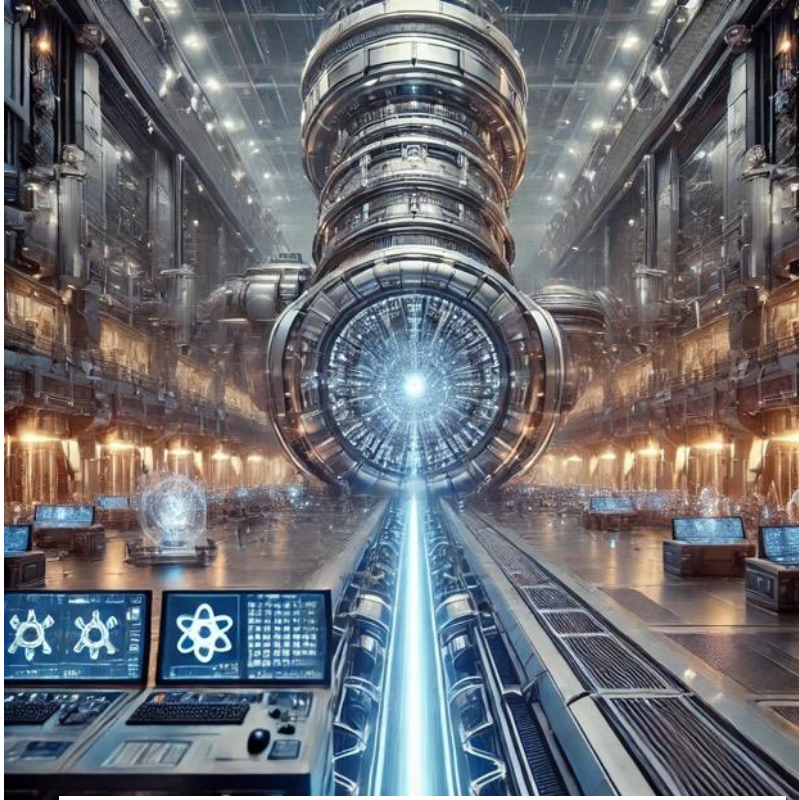
We can't build anything without you! Please visit the vendors, delegates....



Your Success. Our Passion.



WHAT DOES CHATGPT THINK?

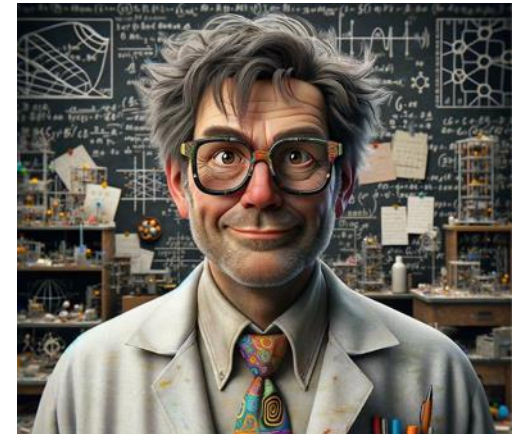


Prompt: *“Show me the ultimate linear accelerator”*



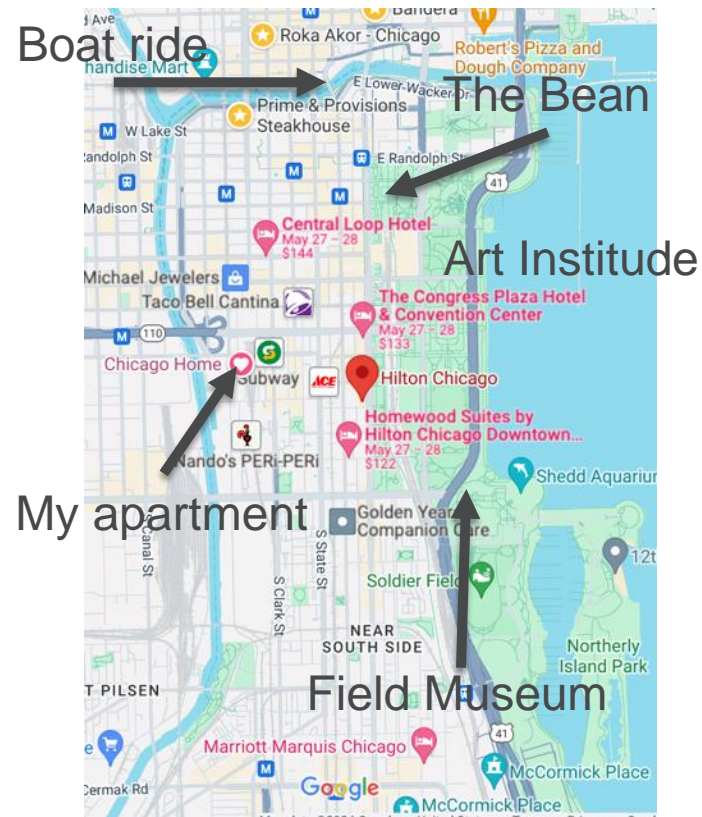
Prompt: *“What does the LINAC24 Chair look like?”*

Prompt: *“What does the LINAC24 Chair really look like?”*



WHERE ARE WE?: CHICAGOLAND IS HOME TO ARGONNE AND FERMILAB

ANL and FNAL are deep in the suburbs



VENUE FLOOR PLAN

All rooms on a single floor. Elevator access from ground and room levels.

Floor 3 ×

<https://visitingmedia.com/tt8/?ttid=hilton-chicago#/3d-model>

Elevators

Grand
Ballroom

Plenary

Foyer

Staircase entrance

Posters

Boulevard

Normandie

Lunch

WHAT TO EXPECT THIS WEEK

More details to come as we move forward



Monday	Tuesday	Wednesday	Thursday	Friday
MOXA Chair: Marion White	TUXX Chair: Catherine Madec	WEKA Chair: Branko Popovic	THKA Chair: Dong-O Jeon	FRXA Chair: Kathy Harkey
8:30 Registration	8:30 Status of the Spallation Neutron Source Proton Power Upgrade	8:30 Masaharu Sato (KEK) Status of the JBNCT Accelerator	8:30 Adrien Nagai (EPJ) Automatic Retuning of Superconducting Linacs using LightWm	8:30 Henrik Hahn (GSI/HE)
9:00	8:50 Henry Prybyl (ESS) The Installation and Technical Commissioning of the ESS Superconducting Linac	8:50 Mario Cevallos (DESY) Advances in Synchronization	8:50 Chang-Kiu Sung (PAL) Utilization of corrugated discharge at the PAL FEL	8:50 Feng Gu (IMP-CAS) Machine Learning Based Fault Classification in Superconducting Cavities at Chinese ADS Front-end Beam SRF Use
9:15 Welcome - Young Kee Kim (University of Chicago), John Byrd (Argonne), and Sam Poen (FNAL)	9:10 Jens Osterhoff (BNL) The 10-TeV Waterfall Accelerator Collider Design Study	9:10 Edward Prat (PS) Sub-Femtosecond Time-Resolved Measurements of Electron and Photon Beams	9:10 Chen Kao (NSR) Matched Transport of Inverse and Coasting Beams through Quadrupole Channels	9:10 Phillip Kuhn (TRIUMF) SRF Coaxial Resonators for Hadron Acceleration
9:30 Donato Passarelli (FNAL) The Future of the Fermilab Accelerator Complex with the new PIP-II linac	9:30 Peter Ostmouren (FRIB) First Two Years of FRIB Operation	9:30 Han Guo (IMP-CAS) Full Automatic Clean Assembly of HWR Cavity	9:30 K'naan Hwang (FRIB) Machine Learning-Assisted Beam Tuning at FRIB	9:30 Edgar Sereyran (CERN) Operational Experience and Reliability of the new CERN Linac4
10:00 Xueying Lu (NIU, ANL) Recent advances in normal conducting radiofrequency linac structures	9:50 Angus O'Neill (GANIL) SPRAL2 operations and future plans	9:50 Alexander Scheiker (LANL) Adaptive Machine Learning with Hard Physics Constraints for 6D Phase Space Diagnostics	9:50 Tom Powers (SLAC) An Overview of Plasma Processing of SRF Cavities at SLAC	9:50 Menghui Xu (IMP-CAS) Status of HAF Linac3 SC cavity system at IMP
10:30 Coffee	10:10 Haosheng Liu (Dongguan Neutron Science Center) CNS Linac Energy Upgrade	10:10 Subashini De Silva (ODU) Crabbing Cavity System Development for International Linear Collider	10:10 Steve Lidia (FRIB) Wide Dynamic Range Diagnostics System for Primary and Secondary Beams at FRIB	10:10 Benjamin Bromberg (RI) Using an Electron Linac to Improve the Sustainability of Diamond Mining
MOXA Chair: Sam Poen	TUXX Chair: Hans White	WEKA Chair: Hans White	THKA Chair: LINAC2024 Pyung-ik Kim	FRXA Chair: John Byrd
11:00 Brend Han (ORNL) Breaking Through 100 nA H ⁻ Ion Source Output Current at SNS	1:00 Camille Glinberg (US-DOE) Accelerator Science and Technology at the U.S. Department of Energy Office of Science	11:00 Sami Tantawi (SLAC) Distributed Coupling Linacs: A Paradigm Shift in Linear Accelerator Design	11:00 Ji-Ho Jang (KEK Korea) Commissioning of the BAOEN Superconducting Linac MCR Asia Korea	11:00 Akira Mizutani (IC Paris) The Quest for High Gradient and High Q in SRF Cavities
11:30 Julian Utzsch (DHL, Nuremberg) Coherent Nanosecond Electron Accelerator	1:30 Lightning talks by participating industries	11:30 Carlo Rossi (CERN) The Deep Electron FLASH Therapy Facility	11:30 Jinfeng Yang (Duke Univ.) Design of Gradient Electron Microscopy with Superconducting RF Gun	11:30 James Rosenzweig (UCLA) Free-electron Lasers for Advanced Semiconductor Manufacturing Needs
11:50 Lucas Scheep (DESY) Operation of FLASH above 1.5 GeV and below 4 cm	2:00 Lunch	11:50 Pantaleo Raimondi (FNAL) PIP-II: An International Endeavor to Enable Neutrino Science	11:50 Stephen Milton (Tsing) High Charge, 10-GeV Electron Bunches from a 30-cm Long, Nanoparticle-Assisted, Laser-Wakefield Accelerator: Our Next Steps	12:00 Stephen Streffer (ORNL) High Power Hadron Linacs: The Spallation Neutron Source Proton Power Upgrade and a Look to the Future
12:10 Zhan Jiu (Duke Univ.) Current Status of LWFA Development Towards Rutherford Tabletop XUV FEL	2:30 Lunch	12:10 William Graves (AGU) Results from Compact X-ray Light Source Commissioning	12:10 Student Prize Session	
12:30 Lunch		12:40 Lunch	12:40 Lunch	
MOXA Chair: Peter Ostmouren	TUXX Chair: Jean Delcroix	WEKA Chair: Robert Ladell	THKA Chair: Robert Ladell	FRXA Chair: Robert Ladell
14:00 Alexander Erlich (SLAC) High-Average Gradient in a Laser-Gated Multistage Plasma Wakefield Accelerator	14:00 Philip Burrows (CERN) Status and Plans for the High-Energy Linear e ⁻ -Collider Projects CLIC, CLIC and CE	14:00 Axel Brachmann (SLAC) Commissioning of LCLS-II	14:00 Axel Brachmann (SLAC) Commissioning of LCLS-II	14:00 Mirsh Sakai (KEK) Various Applications of SRF Linear Accelerators in KEK
14:20 Oksana Chubenko (NIU) State-of-the-Art Photocathodes for Bright-Beam and Spin-Polarized Beam Generation	14:20 Branko Popovic (ANL) Fabrication and Beam Testing of a 380 GHz Collinear Wakefield Accelerator	14:20 Outing	14:20 Julien Brandard (DESY) RF-based energy savings at the FLASH and European XFEL fronts	
14:40 Nathan Majumdar (SLAC) Beam Shaping Using an Ultra-High Vacuum Multibeam Collimator and Emittance Exchange Beamline	14:40 Zhiyu Wang (IMP-CAS) The Progress of CASIS Linac and first-order beam acceleration		14:40 Oral Posters	
MOXA Chair: Peter Ostmouren	TUXX Chair: Jean Delcroix	WEKA Chair: Robert Ladell	THKA Chair: Robert Ladell	FRXA Chair: Robert Ladell
15:00 Oral Posters	15:00 Oral Posters	15:00 Oral Posters	15:00 Oral Posters	15:00 Oral Posters
MOPB 16:00 Posters - 16:00 - 18:00	TUPB 16:00 WISE+ Event	WEKA 16:00 Conference Banquet	THKA 16:00 Conference Banquet	FRXA 16:00 Conference Banquet

- DOE-HEP talk followed by vendor lightning talks on Tuesday
- WISE+ event Tuesday evening
- Chicago River Cruise/out Wed afternoon
- Banquet on Thursday evening (live Blues music and DJ/dancing)
- Conference ends promptly by 1 PM on Friday (another event happens Friday evening)

THESE ARE EXCITING TIMES FOR US

Recent highlights in the accelerator community with emphasis on domestic projects



- First light at LCLS-II, the first high-power XFEL and significant progress on SHINE.
- Progress on PIP-II as proton driver for LBNF/DUNE
- Multi-MW power upgrade for the SNS is nearing completion with several other high power proton drivers worldwide, including ADS.
- New P5 (Particle Physics Project Prioritization Panel) Report has been issued with US plans for HEP.
- The Electron-Ion Collider at Brookhaven has CD-1 approval
- The Advanced Photon Source Upgrade (APS-U) has successfully commissioned and is serving users. Uses MBA lattice technology to achieve ~40 pm emittance. Many other similar light sources under construction, design, or planning.
- Many new and expanding industrial applications for linacs, including new applications in the semiconductor and medical isotope industry.

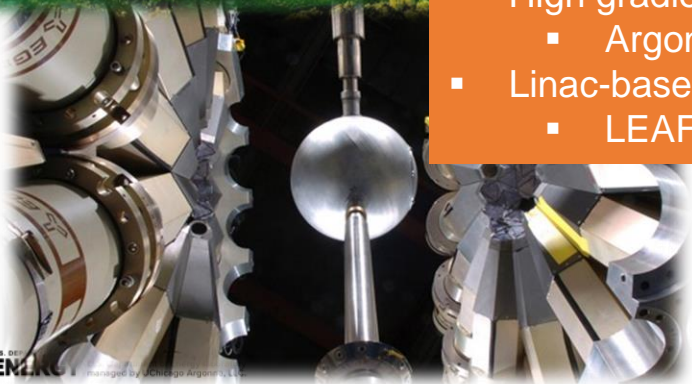
ARGONNE'S ACCELERATOR PORTFOLIO



Accelerator-based facilities in high energy and nuclear physics and light sources



- Accelerator science and technology:
- Storage ring light source
 - APS Upgrade
 - Superconducting RF technology
 - ATLAS
 - High gradient wakefield technology
 - Argonne Wakefield Accelerator
 - Linac-based isotope production
 - LEAF



MANY ACCELERATOR HIGHLIGHTS COMING OUT OF ARGONNE



You will hear more about some of these during the conference

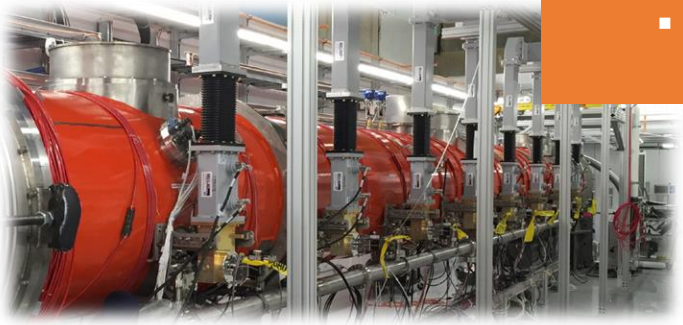
- Commissioning of the new APS Upgrade is now complete and operating for users. AP-U stands as the world's brightest ring-based light source (for now!). Using multibend achromat lattice technology, the measured emittance of ~ 40 pm is where we expect. The next year will focus on turning on new beamlines and improving operations.
- The AWA supports R&D into high gradient NCRF structures. A breakthrough over the past few years shows very high gradients possible (>400 MV/m) with ultrashort RF pulses (~ 10 nsec).
- ATLAS supports heavy ion nuclear physics with its SCRF linac. They are moving to multiuser operation.
- LEAF performs research into the production of radioisotopes and uses a low energy electron beam (50 MeV/25 kW) to irradiate samples for isotope production.

FERMILAB'S ACCELERATOR PORTFOLIO

Accelerator-based facilities for high energy physics and accelerator science and technology R&D



- Accelerator science and technology:
 - Fermilab accelerator complex
 - PIP-II, ACE-MIRT, ACE-BR
 - Production of advanced components
 - PIP-II, AUP, HE, Mu2e, PPU...
 - Accelerator R&D
 - SRF, magnets, beam physics, high power targets



MANY ACCELERATOR HIGHLIGHTS COMING OUT OF FERMILAB



You will hear more about these during the conference

- The Fermilab accelerator complex is the backbone of accelerator-based research at Fermilab including neutrino- and muon-based experiments. Achieved ~1 MW of proton power for the first time this year.
- PIP-II is a superconducting linac under construction that will enable the next era of science at Fermilab including LBNF/DUNE
- Important accelerator R&D advances in SRF, magnets, beam physics, and targets
- Production of state-of-the-art accelerator components for PIP-II, HL-LHC-AUP (first cryoassembly delivered this year), LCLS-II-HE, Mu2e, SNS PPU, LBNF/DUNE...
- Exciting plans for the future of the Fermilab accelerator complex beyond PIP-II including ACE-MIRT to increase proton power on target to 2 MW and ACE-BR to replace the booster for reliability, a broader physics program, and as a platform for a possible future multi-TeV muon collider

CODE OF CONDUCT



Please be respectful of everyone here at the conference

The LINAC2024 local organizing committee is committed to providing a safe working environment, and promoting respect, equity and balance. LINAC2024 is also committed to upholding the highest ethical standards in all of its activities. We expect conference attendees to comply with applicable laws and to conduct themselves responsibly, ethically and with integrity.

Compliance with this Code is mandatory for all attendees. LINAC2024 expects attendees to comply with both the letter and the spirit of this Code. Conduct that is illegal, dishonest or unethical constitutes a breach of this Code, whether or not the conduct is specifically addressed in this Code.

EMERGENCY NUMBER: You can reach 911 from a hotel phone by dialing 55 first.



**ENJOY
CHICAGO,
LINAC 2024!**

A WELCOME FROM YOUNG-KEE KIM

On behalf of University of Chicago, manager of Argonne and Fermilab



- Louis Block Distinguished Service Professor, Dept. of Physics, Enrico Fermi Institute, University of Chicago
- Senior Advisor to the Provost for Global Scientific Initiatives
- Fellow of the American Academy of Arts and Sciences (2017), the American Association for the Advancement of Science (2012), the American Physical Society (2004) and the Alfred P. Sloan Foundation (1997)
- Best known for experimental particle physics, Y2K also has deep interests in accelerator science and plays a leadership role in the NSF's Center for Bright Beams