FEBRUARY 2023 ISSUE NO. 3

The Beam Pulse

The latest highlights in Accelerator Directorate

Stay warm, AD!

Enjoy this month's issue of *The Beam Pulse*, brought to you by the Program and Project Support Office (PPSO). Check out the new AD Org Chart and engage with members of leadership if you have questions, comments or want to wish them well in their roles.

Always watch for ice, make sure the air pressure in your tires hasn't dropped with the outside temperatures and never leave your space heaters unattended! Have a great February and let us know what content you want to see in March.

Alyssa Miller, Noel Wiedman, Richard Wallace; PPSO

Find us online: ***ad.fnal.gov/hq/PPSO***

Feb 10: Employee Art Show Reception
4-6p, WH 2nd Floor Crossover (*deadline to enter submissions:* ***Feb 6***)

Feb 14: Valentine's Day

Feb 20-24: 9th Annual All Engineers' Retreat
Activities organized by the Engineering Advisory Council

Feb 24: Retreat keynote speaker: Kimberly Moore
1-2:30p, Ramsey Auditorium & Zoom (*register here*)

... Flannel Fridays continue!

See the labwide calendar here

▶ *Inside this issue:*

Celebrate Black History Month

Fermilab's African American/Black Association, Women's Initiative and the Office of Equity, Diversity and Inclusion are excited to co-sponsor a two-part event to help honor Black History Month.

Feb 8, 12-1p: Book club discussion
A Black Woman's Journey from Cotton Picking to College Professor: Lessons about Race, Class, and Gender in America | Dr. Menah Pratt-Clarke. (Copies are available from the Fermilab Library; *register here*.)

Feb 14, 1-2p: Meet the author
Dr. Menah Pratt-Clarke is the Vice President for Strategic Affairs and Diversity at Virginia Polytechnic Institute and State University. Participants will have the opportunity to discuss her book and learn about her journey. (*Register here.*)

 Photo credit: Marty Murphy

Fermilab

Ch-ch-ch-ch-changes! Meet AD leadership


Photo credit: Giulio Stancari

Alexander Valishev;

Associate Laboratory Director for Accelerators

AD has been my home since I joined the lab in 2003 as a guest scientist to work on beam-beam effects in the Tevatron collider Run II. A quick one-year term turned into an almost 20-year career providing me with opportunities to work on many topics of accelerator science and technology.

Before Fermilab, I worked as an accelerator scientist at the Budker Institute of Nuclear Physics in Novosibirsk, Russia, focusing on the physics of colliding beams. The work environment I found in AD is a major reason why I never regret the move to a different continent, country, and language environment. The ability of people in Accelerator Division to work harmoniously on solving the most difficult problems of accelerator physics, technology, and operations, the innovative 'can do' spirit is what I want us to carry into the Accelerator Directorate.

AD is entering an exciting era: we began beam commissioning for the Mu2e experiment; we are contributing to the construction of and in just a few years will be commissioning the new PIP-II linac and the upgraded Booster with the goal of delivering beam to the flagship LBNF/DUNE experiment; the impactful beam physics research at FAST/IOTA continues to grow, and we are launching new initiatives.

All of this is happening as we continue operating the accelerator complex to deliver beams to the physics users. The challenges we face on this path are numerous and significant: running at an unprecedented level of beam power results in the high radioactive activation of accelerators and enclosures, maintenance of the aging infrastructure becomes progressively difficult, especially in the world affected by supply chain issues, and the retirement of many of our long-time colleagues takes away decades of accumulated knowledge and top-level expertise.

As the Associate Lab Director for Accelerators, I see my role in developing AD's strategic directions and in facilitating the most efficient execution of AD's mission in close collaboration with other Fermilab organizations and external stakeholders. Simply put, my job is to make sure that our experts are fully equipped to do what they aspire to and are trained to do: design, build and operate world's most innovative accelerators and systems. In this work, I rely on the able leadership of our three Division Directors.


Photo credit: Marty Murphy

Mary Convery;

Director of Beams Division

From 1994-2007 I was a grad student and university researcher on Tevatron collider experiments. I joined AD in 2007 and have had several roles such as Tevatron shot data analysis and run coordinator, g-2 Deputy Project Manager and Muon Campus Program Coordinator, Associate Head and Deputy Head of AD, and LBNF Deputy Project Director. I continue working on LBNF along with my new role as Beams Division director.

I lead the "machine" departments, mainly focused on delivering beam to the experiments. I help collect and prioritize budgetneeds for accelerator operations. I interface with APS-TD regarding magnets needed for operations.

One of the goals I have been pushing for is to have the skilled and diverse workforce needed to run the accelerator complex in the PIP-II era. This requires a constant effort to hire and train the next generation of experts prior to the long shutdown. (Thanks to all of you who have been working so hard at this!) We have made efforts, and I think gains, in diversity over recent years and it makes AD an even more enjoyable place to work!

Ch-ch-ch-ch-changes! Meet AD leadership

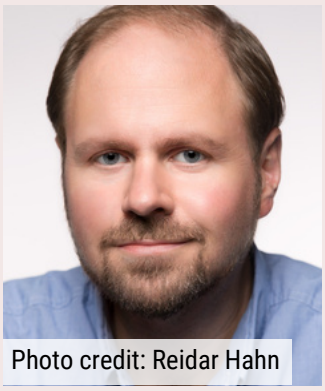
Photo credit: Reidar Hahn

Bob Zwaska;

Director of Accelerator Complex Technology Division

I started working with Fermilab in 2000 as a student at the University of Texas. I graduated in 2005 having worked on NuMI beam focusing, instrumentation, commissioning and also the Booster low-level RF (LLRF) cogging. As an employee I have worked on the electron cloud, NOvA upgrades, slip-stacking, LBNF, PIP, the NuMI Megawatt upgrade and high-power targetry. In the process I became a subproject manager, deputy manager of PIP, and eventually had the opportunity to form the Target Systems Department.

The ACT Division develops and operates many of the technologies necessary for keeping the accelerators operating every day. These include power supplies, mechanical and fluid systems, vacuum, RF acceleration and feedback, electronics, instrumentation, kickers, controls and software.

This group keeps the Accelerator Complex running with these technologies while also building projects for the future, including PIP-II, LBNF and Mu2e. Additionally, the ACT Division hosts the ACORN project, which is creating a next-generation controls system for Fermilab, including capabilities for artificial intelligence. The challenges and demands of these projects present an opportunity for us to lead in accelerator technologies on a global scale, and I look forward to working with our evolving workforce to achieve our ambitious goals.

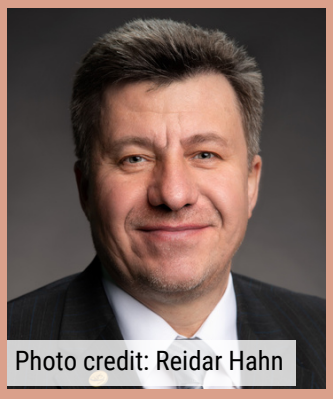
Photo credit: Reidar Hahn

Vladimir Shiltsev;

Director of Accelerator Research Division

A 1994 PhD graduate in beam physics, I worked in leading accelerator laboratories in Novosibirsk and Protvino in Russia, the Superconducting Super Collider Lab in Texas (USA) and DESY in Hamburg before joining Fermilab as a Wilson Fellow in 1996. Here I'd initiated and led the project of beam-beam compensation with the Tevatron Electron Lenses. In 2001 I was appointed to lead the Tevatron Department in quite turbulent and heroic years of the Collider Run II. In 2007, I became the inaugural Director of the Fermilab Accelerator Physics Center. In the past two years, I was a co-convener of the Snowmass'21 Accelerator Frontier.

I am a true believer in what might be called "integrated approach". All modern accelerators are a sophisticated mix of many systems and many teams need to work hand-in-hand. Correspondingly, success depends on all and each of the diverse groups which should be motivated, properly involved and understand their roles. Most important of all, they must be sincerely interested to making "the whole" a success. Thus, talking to and working with many different people in AD, APS-TD and other Divisions is one of my top priorities.

With the recent conclusion of the almost two-year-long process of strategic planning for particle physics in the US (Snowmass'21), we anticipate P5 recommendations which will determine our future for the decades ahead. AD, and Fermilab in general, is at an important crossroads now, with several options for "what to do next". I see the ARD organization to become one of the most influential forces both in the formulation of the plan of actions for the lab and in its subsequent execution.

AD Spotlight

Paul Czarapata retires after 50 years

Photo credit: Marty Murphy

A well-attended ceremony was held on the Wilson Hall 2nd Floor Crossover on January 25. Read Paul's retirement article in Fermilab News.

Greg Vogel retires after 33 years of service

Photo credit: Lila Anderson

Greg celebrated his retirement from AD's Accelerator Controls Department with his colleagues on January 17 on the Wilson Hall 2nd Floor Crossover.

Wally Kissel celebrates 50 years of service

Photo credit: Christine Ader

AD hosted a potluck with a delightful spread of offerings on January 6 in the Cross Gallery West Huddle to celebrate Wally's anniversary.

SPOT the Robot helps deliver colloquium

Photo credit: Alyssa Miller

Mayling Wong-Squires of the Mechanical Support Department spoke at the weekly colloquium series on behalf of the AD Robotics Initiative on January 25, during which Adam Watts of the ACORN Project gave an exciting demonstration of SPOT's capabilities for the audience in Wilson Hall One West.

 Photo credit: Efrain Cortez

A Word from Safety

ES&H introduces new shoe covers for tunnel access

The Environment, Safety and Health (ES&H) Division Radiation Physics Operation (RPO) has listened to the complaints about our present shoe covers being a safety issue, and we are working on replacing them.

New latex shoe covers have been ordered! The new shoe covers fit tight and stretch for various shoe sizes. They are durable and waterproof, eliminating the need to carry rubber boots when passing through small puddles of water. Double shoe covers will be required for accesses near Contamination Areas: radiological workers will remove the outer pair after passing through that space.

We have ordered the shoe covers in 3 sizes:

Medium (blue)

Large (yellow)

X Large (orange)

For work in a Contamination Area we have ordered plastic inserts that will come up higher over the ankle and provide coverage between the shoe covers and the coveralls in such a scenario.

Savings note

- Our current shoe covers cost $7.25 per pair
- The new covers cost $4.70 per pair
  - The inserts cost $1.00 each

Joel Fulgham; ES&H Radiation Physics, AD RSO

Photo credit: Joel Fulgham

Above: The plastic inserts cover the entire shoe and come up high over the ankle. The stretchy shoe cover is worn over the plastic insert.

The Machine Report

NuMI work continues

AD's EE Support and Target Systems Departments identified two separate cracks on the conductive striplines which carry current to the two beam-focusing horns surrounding the NuMI target in early December, disabling beam. The location of one crack requires the replacement of Horn 2 and a portion of the stripline.

Photo credit: James Zahurones

Above: the crack on the horn stripline as seen from a borescope camera.

Horn 2 has been removed from the MI-65 Target Hall and the portion of the stripline which connects to one end of the horn has been disconnected and closely inspected. A new stripline "stub," a specific portion of the entire current path, was also fabricated. The replacement Horn 2 was tested with 100,000 full-current pulses over five days on the test stand in the MI-8 Service Building during the week of January 23.

This replacement process has included countless quality-assurance tasks such as radiography inspection of the stripline weld surfaces, torque checks on mechanical connections and flushing of cooling water lines.

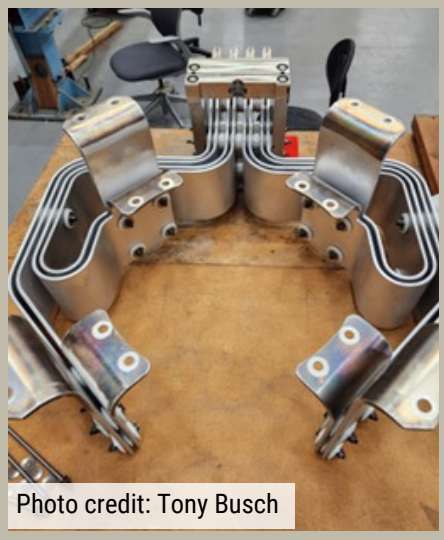

Photo credit: Tony Busch

Above: striplines which were removed from the horn for testing at the MI-8 Service Building.

The remaining work includes final surface preparation of the stripline stub conductors, silver plating of the critical contact surfaces and installation of the new horn in the Target Hall beamline chase. The team continues to work diligently and hopes to bring the experiment back online as soon as possible.

Written by Alyssa Miller with contributions from Tony Busch (TSD Engineering, NuMI Shutdown Coordinator)

AD & PIP-II: SRF Support

The AD Mechanical Support Department (MSD) Superconducting Radiofrequency (SRF) Systems group supports PIP-II in two major ways: It manages the Linac Installation and Commissioning portion of the PIP-II Project and it also oversees the Cryomodule Test Facility (CMTF) building, which includes providing engineering and technical support for the PIP-II Integrated Test (PIP2IT) cryomodule test stands.

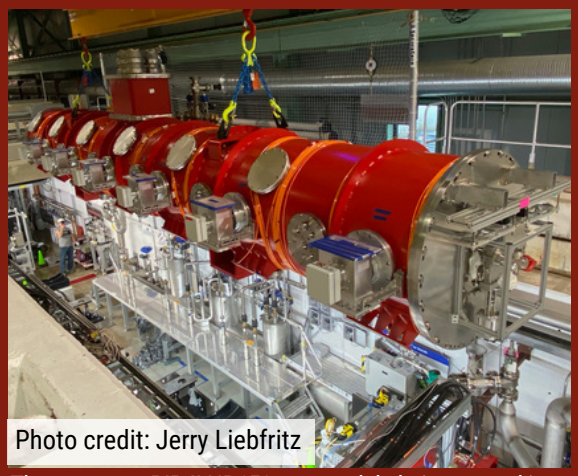

Photo credit: Jerry Liebfritz

The prototype PIP-II HB650 cryomodule being craned into the PIP2IT test stand at CMTF.

Over the past 1.5 years, we have removed the PIP-II Injector test accelerator from the PIP2IT test cave and just finished converting the area into a test stand to test the PIP-II cryomodules. The first PIP-II prototype 650 MHz cryomodule just arrived on January 12th and is currently being installed at the test stand (shown below). The successful operation and testing of this cryomodule is a major goal for both our group and the Project.

Jerry Liebfritz; AD MSD SRF Group, PIP-II Level 2 Manager

Know Your Organization!

New hires

Aakaash Narayanan;
External Beam Delivery Department

Alexander Kellerhouse;
Accelerator Operations Department

Diana Wilson;
Administrative Services

Gage (Shannon) Whittington;
Administrative Services

Gopika Bhardwaj;
Accelerator Controls Department

Matthew Hartung;
Accelerator Operations Department

Matthew Saewert;
Electrical Engineering Support

February work anniversaries

Rom Bacino (2) • Deborah Bonifas (43) • Gregory Brown (38) • Tony Busch (31) • Joe Compton (21) • Matthew Davidson (2) • Jeffrey Eldred (7) • Marilyn Franck (7) • Kenneth Hartman (34) • Shreya Joshi (3) • Samantha Lewis (2) • Zunping Liu (1) • Carl Lundberg (43) • Nikolai Mokhov (31) • Julio Ortega (1) • Rude Perez (22) • Dustin Pieper (1) • Vitaly Pronskikh (13) • Robert Scala (44) • Spencer Schiefelbein (4) • Nino Strothman (22) • Bill Sullivan (1) • Michael Wesley (9) • Richard White (32) • Don Athula Wickremasinghe (4) • Mayling Wong-Squires (26)

 Photo credit: Greg Vogel