

Project Highlights

- Steve Holmes and Bill Foster awarded the 2022 Robert R. Wilson Prize!
- · PIP-II site work construction contract awarded
- Fermilab/PIP-II welcomes communications specialist Madeleine O'Keefe; accelerator physics postdocs Sajini Wijethunga and Abhishek Pathak
- · International Partner highlights
 - Cryoplant kickoff meeting with BARC-Fermilab-Air Liquide held in October
 - LB650 cavity successfully tested at LASA

Upcoming Events

1 Sept-31 Jan '22	ASPIRE Fellowship application period
30 Nov-2 Dec	CD-3 Director's Review
15 Dec	10 th Project Executive Board (P2PEB) Meeting
16-17 Dec	PIP-II Sustainability Workshop
1–3 Mar '22	DOE CD-3 IPR

Congratulations Steve Holmes and Bill Foster on the 2022 Robert R. Wilson Prize!

Previous PIP-II Project Director Steve Holmes and previous Fermilab employee Bill Foster received the 2022 Robert R. Wilson Prize for Achievement in the Physics of Particle Accelerators for their leadership in developing the modern accelerator complex at Fermilab.





Steve Holmes and Bill Foster

Congratulations Steve and Bill!



Drawing of the PIP-II site plan

PIP-II site work construction contract awarded

The site work will include raising the grade on the PIP-II site by about 3 feet, completing the pond crossings, restoring the 50+ year-old Main Ring pond and creating the roadways for PIP-II. It is expected to start in late November and be completed in October of 2022. PIP-II welcomes new communications specialist Madeleine O'Keefe, who is matrixed from the Office of Communications, and accelerator physics postdocs Sajini Wijethunga and Abhishek Pathak.



Highlights from around the world: PIP-II's International Partner activities



The kickoff meeting for the PIP-II Cryogenic Plant was held in October and was well attended including representatives from DAE/BARC, Air Liquide and Fermilab. This marks the official start of the cryoplant detailed design.



PIP-II cryogenic plant components



Horizontal Test Stand (HTS) at RRCAT

After a vacuum leak in the nitrogen circuit, the HTS has been repaired at RRCAT and is being prepared for testing of high beta 650 MHz AES010 jacketed cavity provided by Fermilab.



Horizontal Test Stand setup at RRCAT for testing HB650 jacketed cavities. Shown are the bucking and degaussing coils for compensation of earth's magnetic field.



Cavity AES010 assembled in HTS cryostat with high power coupler (ready for test).

VTS tests preparations for RRCAT HB650 cavity



The first tests on RRCAT-made high beta 650 MHz 505 cavity demonstrated 29 MV/m accelerating gradient with acceptable quality factor. Field emission was observed. The cavity is being prepared again for tests after repeat high pressure rinsing (HPR).



LB650 cavities

Seven PIP-II LB650 cavities already produced (single and multi-cell), three shared with Fermilab

First INFN single-cell with baseline recipe

- Developed with Zanon, novel EP and diagnostic
- Vertical test (VT) at INFN-LASA
- High-Q treatment and re-test next

Second INFN single-cell treated at FNAL

- Test at Fermilab-VTS, project goals met

Two INFN 5-cell cavities proceeding in parallel

- B61-EZ-001 from March at Fermilab VTS, currently limited in pi-mode by mode-mixing but with each cell reaching about 18 MV/m
- Cavity being jacketed
- B61-EZ-002 with baseline treatment (no high-Q, mid-T bake only) successfully cold tested at LASA



2K cryogenic system now installed with B61-EZ-002 for VT at LASA



LB650 5-cell VT at LASA







LB650 Cryomodule

The LB650 cryomodule detailed design is ongoing as well as the design studies on the assembly tooling. Highlights below.



Clean room assembly tooling: preliminary design complete



Ongoing studies of the tooling for cold mass assembly and its insertion in the vacuum vessel



Progress on SSR2 cavity prototypes

All the tooling required to process SSR2 cavities at IJCLab has been ordered and is under fabrication. Some have already been delivered.



SSR2 tooling: reception tool, HPR tool, frequency tuning

Status of prototype SSR2 couplers fabrication at PMB Cie

Procurement of 4 prototype couplers is ongoing at PMB company:

- · Reception of tubes and bellows by PMB
- First try of TiN coating on a full ceramic window shows very good thickness uniformity (~ 10 nm +/- 1 nm)
- Several analyses on samples have been performed showing contamination due to masking (grey coloration of ceramic on the edges see photo, right). Problem resolved.
- · Delivery of couplers is foreseen in April 2022





HB650 Cavities

To achieve rapid cool-down (and hence maximize Q₀), the Daresbury team proposes to re-configure the existing vertical test insert (VTI) used to support cavities during cryogenic testing. The 3-cavity VTI will be replaced with a single cavity VTI, and by adopting static vacuum testing protocols (agreed with Fermilab), it is expected there will be no net impact on the testing schedule for PIP-II. The images below show the current (left hand side) and proposed (right hand side arrangements) VTI configurations.





Proposed single cavity VTI configuration to permit rapid cool-down

VTI configuration currently at Daresbury Laboratory

• HB650 Cryomodule

- Assessment of HB650 cryomodule assembly process is ongoing
- UK completed final design review of clean extension for cavity string assembly in October, with support from Fermilab colleagues.

Transportation

- An experiment to test the system response to a drop from height of the crab cavity that Daresbury Laboratory is delivering to the Hi-Lumi project was undertaken recently. A video still from the experiment, and a view of the rig prior to the controlled drop, are below. The PIP-II technical team is supporting this experiment and will pass forward any lessons learned. Wound-coil springs used in the Hi-Lumi transport frame are identical to those used in the HB650 transport frame.



Hi-Lumi transport frame with dummy load prior to drop test at Daresbury



Still image from video of drop test experiment

Infrastructure

- A new SRF component incoming inspection room has been implemented within the SuRFLab test facility at Daresbury Laboratory to enable critical PIP-II cavity and cryomodule sub-system components to be effectively and efficiently assessed prior to validation and implementation.



New humidity, temperature and particulate controlled inspection room at Daresbury