



April 14, 2022 REPORT | MAR 28 – APR 22
DIRECTOR: TODD SATOGATA

Todd Satogata

Previous two weeks (Mar 28 – Apr 8)

- EIC Meetings (management, RF, crab, cooling, impedance, team, R&D, beam-beam)
- EIC BNL Meetings (Ferdinand and L2s, Design/R&D leadership)
- EIC IR/MDI review (Apr 6-7), dry runs (Mar 30 – 31)
- EIC continue evaluating crab multipole time-domain simulations
- MGMT Meetings (Leadership/Dept Heads, CASA coffee, Andrei triweekly)
- ODU Josh Yoskowitz PhD Defense (Apr 1), Sunil Pokharel annual review (Apr 4)
- SERVICE DOE ECA Super Panel (Apr 4-6), APS DPB EOD (Apr 8)
- MED LEAVE (Apr 5, AM)

Next two weeks (Apr 11 – Apr 22)

- EIC Meetings (management, RF, crab cooling, impedance team, R&D, beam-beam)
- EIC BNL Meetings (Ferdinand and L2s, Design/R&D leadership)
- EIC L2 cost/schedule meetings; PSQ@EIC paper update/editing
- EIC Continue evaluating crab multipole time-domain simulations
- MGMT Meetings (Leadership/Dept Heads, CASA coffee, P&C Apr 21)
- MGMT Q2 PEMP content update/review
- SERVICE APS DPB business meeting (Apr 11)
- OPS 12 GeV paper writing (for Geoff Krafft)
- ODU Sergei Nagaitsev visit/seminar (Apr 14)

Alex Bogacz

Previous two weeks (Mar 28 – Apr 8)

- Mentoring Isurumali on optimizing isochronous arc optics
- FFA@CEBAF collaborative work
- Finalizing a joint FOA with BNL and Cornell
- Presenting a talk on CEBAF energy upgrade for J-FUTURE workshop
- Write up on the LHeC ERL and PERLE for 'Future of LHC' publication

Next two weeks (Apr 11 – Apr 22)

- Mentoring Isurumali on Spr/Rec optics
- FFA@CEBAF collaborative work
- ERL'22 SPC work, invited talk selection
- Invention disclosures review
- Vacation

Ryan Bodenstein

Previous two weeks (Mar 28 – Apr 8)

- Various OPS related meetings
- FFA@CEBAF collab work
 - First spreader done unrealistically strong dipoles. Looking into new layouts
 - FOA administration, edits, and submission
- Positron/FFA liaison work
- Student Guidance
 - Isurumali – guidance for arc optics, edits to papers, wrote recommendation letter
 - Alex C – Getting lab laptop, general guidance and mentorship
- LDRD work



April 14, 2022 REPORT | MAR 28 – APR 22
DIRECTOR: TODD SATOGATA

- Preparing for Q2 report
- Tunnel Tours
 - First for students, postdocs, and staff
 - Second for all new staff

Next two weeks (Apr 11 – Apr 22)

- Various OPS related meetings
- FFA@CEBAF collab work
- Positron/FFA liaison work
- Student Guidance
 - Isurumali – guidance for arc optics
 - Alex C – general guidance and mentorship, checking on CAS attendance funded through traineeship
- LDRD work
 - Q2 report delivered
 - Included CASA member to take up work intended for postdoc

Rui Li

Previous two weeks (Mar 28 – Apr 8)

- For the TCBI simulation, refining post-processing tools for my simulation modeling and examining the characteristics (growth rate and coherent tune shift) for each coupled-bunch mode
- Zoom discussion with Fanglei Lin on the CSR and other collective effects in the ERL-based XFEL machine design which she is preparing as her LDRD proposal for the SNS
- Vacation (3/28)

Next two weeks (Apr 11 – Apr 22)

- Working on developing analytical theory toward explaining my numerical observation of the characteristics of the coupled-bunch modes, which are somewhat quantitatively different from the simple TCBI theory (The TCBI theory assumes a distributed transverse wake in the ring but in numerical modeling a localized transverse kick is typically used)
- Vacation (4/12, 14-15)

Edy Nissen

Previous two weeks (Mar 28 – Apr 8)

- Attend Beam-beam and RCS meeting
- Attend required OPS/Bteam meetings
- Worked on Fusion cross section calculations for IPAC paper
- Work on Raster project for Hall D
- Attend Hall D beam line working group meeting

Next two weeks (Apr 11 – Apr 22)

- Attend require OPS/Bteam meetings
- Attend Beam-beam and RCS meetings
- Work on DODGE data for IPAC paper and prepare beam time proposal
- Work on Raster project for Hall D
- Attend Hall D Beamline working group meeting



April 14, 2022 REPORT | MAR 28 – APR 22
DIRECTOR: TODD SATOGATA

Chris Tennant

Previous two weeks (Mar 28 – Apr 8)

- AI FOA: coordination meetings (project-wide, field emission, fault prediction) meeting to develop road map for field emission work, DOE quarterly report
- LD2202: meet with UVA, good progress on visualizing CEBAF injector setups
- RADSA2: training model with additional (historical) data and testing on new data
- R&D FOA proposal: finalize budget, budget justification, final edits submission
- Invited to join steering committee for Digital Engineering Conference (INL)
- Preparing AI highlight slides for Manouchehr
- Preparing JLab robotics slides/text for Manouchehr
- Training
- vacation

Next two weeks (Apr 11 – Apr 22)

- AI FOA: Coordination meetings (project-wide, field emission, fault prediction)
- LD2202: working/learning to get access to GPU environment via lab's Jupyter Hub to be able to train models, quarterly report
- RADSA2: training model with additional (historical) data and testing on new data
- R&D FOA proposal: finalize budget, budget justification, final edits submission
- Strategizing for how to understand and deal with data drift for all our ML/AI projects involving CEBAF
- Training

Accelerator R & D - Yuhong Zhang

Yuhong Zhang

Previous two weeks (Mar 28 – Apr 8)

-

Next two weeks (Apr 11 – Apr 22)

-

Kirsten Deitrick

Previous two weeks (Mar 28 – Apr 8)

- Lower energy zigzag stretcher for ERL with new injector beam
 - Longer linac version, more flexibility with initial beam parameters; 6 dipoles and 4 dipoles configurations
 - Presented 6 dipole version in Strong Hadron Cooling meeting
- FFA cell lattice for FFA@CEBAF
- Presentation delayed by FOA proposal, now given
- Similar results to others' simulations, need to track down discrepancies
- FOA proposal
- Ryan's JLab tour
- Meetings: CASA Coffee, JLab EIC, EIC Weekly, EIC Coffee, Strong Hadron Cooling, EIC Cooler Lattice, FFA@CEBAF, Accelerator Seminar (Geoff Krafft)



April 14, 2022 REPORT | MAR 28 – APR 22
DIRECTOR: TODD SATOGATA

Next two weeks (Apr 11 – Apr 22)

- SHC ERL
 - 4-dipole zigzag stretcher with parallel plate dipoles completed
 - Microbunching simulation
 - Swap out 2-cell srf cavity in injector for two 1-cell cavities
- FFA cell lattice for FFA@CEBAF
 - Track down discrepancies
- BMAD tutorial
- Meetings: CASA Coffee, JLab EIC, EIC Weekly, EIC Coffee, Strong Hadron Cooling, EIC Cooler Lattice, FFA@CEBAF, ODU Colloquium (Sergei Nagaitsev)

Bhawin Dhital

Previous two weeks (Mar 28 – Apr 8)

- Was working to figure out the cooling requirements in a dual energy storage ring cooler
- Was working on thesis writing

Next two weeks (Apr 11 – Apr 22)

- Will continue on thesis writing and on cooling simulations in a dual energy storage ring
- Will work on IPAC'22 papers

Amy Sy

Previous two weeks (Mar 28 – Apr 8)

- Laser particulate counter: Working on MATLAB remote control of the translation stage in the new test setup. Vendor visited on 4/8 to clean fiber connectors and connect to all sensor modules currently on-site.
- Positrons: First regular biweekly meeting on spin rotator work. Discussed plan to start with Hall A footprint and try to fit into existing space. Working with Hall A Elegant deck to extract physical and beam parameters needed for the match. Working on putting together LDRD preliminary proposal for assessing CEBAF with degraded electron beams.

Next two weeks (Apr 11 – Apr 22)

- Laser particulate counter: Continued work on MATLAB remote control of the translation stage in the new test setup. Will likely start repeatable wire passage testing this week.
- Positrons: Continued work on LDRD preliminary proposal. Next meeting on spin rotator design. Working on using the last few dipoles in the Hall A line as the basis for a first spin rotator design.

Computational Physics - Yves Roblin

Yves Roblin

Previous two weeks (Mar 28 – Apr 8)

- BTEAM meetings and coordination
- Positron project meetings
- Mentoring PhD student on positron project
- Preparing optics for next run
- Target alignment procedural development for Hall A upcoming He3 exp.



April 14, 2022 REPORT | MAR 28 – APR 22
DIRECTOR: TODD SATOGATA

Next two weeks (Apr 11 – Apr 22)

- Bteam coordination/meetings
- Positron project meetings & PhD student mentoring
- Optics work for CEBAF
- Panel interviews for positron postdoc
- Abstract writing/talk preparation for NAPAC 2022
- Reviewing injector apertures in the chicane, in particular from OR08 to MBLOR04
- Designing new ARC1/ARC2 optics for low dispersion runs
- Reviewing ORFP procedures prior to startup/adjusting as needed

Randi Gamage

Previous two weeks (Mar 28 – Apr 8)

-

Next two weeks (Apr 11 – Apr 22)

-

River Huang

Previous two weeks (Mar 28 – Apr 8)

- EIC Beam-Beam project: continuing adjusting the parameters of the crab cavities and studying the emittance growth rate, checking the dynamic status of HSR and the betatron tunes for different configurations.

Next two weeks (Apr 11 – Apr 22)

- Continue working on EIC Beam-Beam project

Isurumali Neththikumara

Previous two weeks (Mar 28 – Apr 8)

- Continue working on ARCs 6, 7, 8 & 9
- Continue writing NSGA optimization on lattice optics paper

Next two weeks (Apr 11 – Apr 22)

- Figured out why the beta-peak suppression is not feasible anymore in arc 6, need to change initial horizontal alpha value compromising the optimized solution
- Need to do a sensitivity study for this comparing the multi-pass linacs
- Attend ODU colloquium virtual & in-person

Dennis Turner

Previous two weeks (Mar 28 – Apr 8)

- HLA
 - Assisted Michele with troubleshooting problems with the rfModDownload tool
 - Continued improvements to rayTrace analyzer
 - qsUtility tweaks and documentation updates
 - ced2elegant tweaks and documentation
- AI FOA
 - Moved fsdFilter tool into CSUE for release into production
 - Data labeling and model training



April 14, 2022 REPORT | MAR 28 – APR 22
DIRECTOR: TODD SATOGATA

- Received advice and pointers to data from Tom Powers to help with RF anomaly detection
- Incorporated Tom's data into the training set
- Develop slides to present progress to the AI FOA group
- Attended MCC photoshoot for Tom Oren
- Completed interview process for new LLAPS hire
- Read Serkan Golge's thesis regarding admittance measurements at CEBAF
- Property Validation
- Attend Accelerator Seminar
- Attended 0800, BTeam, AI FOA, CASA, PPB, SRF/F Ops, LCLS-II commissioning, UITF meetings
- Discuss involvement with FFA LDRD with Ryan
- Took laptop to the Computer Center with a swollen battery. Spent some time setting up software on the loaner, using personal laptop

Next two weeks (Apr 11 – Apr 22)

- HLA
 - Assisted Michele with troubleshooting problems with the rfModDownload tool
 - Continued improvements to rayTrace analyzer
 - qsUtility tweaks and documentation updates
 - ced2elegant tweaks and documentation updates
- AI FOA
 - Code cleanup and documentation
 - More data labeling
 - Presented progress to the AI FOA group and received much advice on how to proceed with model development
 - Started work on a GUI interface for Ops to visualize results from the anomaly detection model
- FFA LDRD
 - Attended intro meeting, got charge code, etc.
 - Installed BMAD and started reading the documentation and tutorials
- AIPINJ
 - Revisited Wien matching. Working on a new testplan for when the OI02 harp and YAG viewer are re-installed
 - Updated PREINJ elegant deck to properly reflect counterwound solenoids and committed to SVN
- Elegant2ced
 - Continued development and debugging
- Ced2elegant
 - Re-fixed a bug that crept back in somehow
- UITF
 - Updated elegant deck to reflect counterwound solenoids and posted to the UITF wiki
 - Work on contribution to UITF paper regarding elegant, optics measurements, etc
- 12GeV PRAB paper
 - Geoff asked for screenshots and more details for the section on pathlength correction
- Attended 0800, BTeam, AI FOA, PPB, FFA LDRD, LCLS-II commissioning, UITF meetings



April 14, 2022 REPORT | MAR 28 – APR 22
DIRECTOR: TODD SATOGATA

He Zhang

Previous two weeks (Mar 28 – Apr 8)

- Finished a GA code for RF Q curve fitting. Trying to get better performance using CUDA (numba)
- Did cooling simulations for the dual ring cooler
- Working on an example of pyJSPEC working together with BMAD

Next two weeks (Apr 11 – Apr 22)

- Finish the example of pyJSPEC working together with BMAD
- Write a note on how JSPEC carries out IBS rate calculation
- Continue writing the FMM paper
- Write IPAC paper

Diagnostic Development - Kevin Jordan

Kevin Jordan

Previous two weeks (Mar 28 – Apr 8)

- Finished 2 week stint as program deputy
 - I presented 10 episodes of “A Look Back...” a history of the early days at the lab
- I completed and submitted the full FOA proposal for Vertical slice experiment connecting a 1497 MHz magnetron to a SRF cavity
- I had Joe get involved ed with redesigning a field probe coupler for the chopper cavity vacuum failure

Next two weeks (Apr 11 – Apr 22)

- Worked on clearing my property list – one outstanding item; this was added to my list this year but I did not see it since the move from the Arc Lab
- Working a few diagnostic opportunities...

Joe Gubeli

Previous two weeks (Mar 28 – Apr 8)

- ARDDOT - Working the new SLM for 3C12. I now have a good model of the beam path and clearances needed. Still working out which type of insertable to use for the mirror. Simplest would be a standard viewer insertable. Other options are a HARP assemble or a new design. Working with Matt P. and a larger group on the RF feedthrough for the CEBAF Chopper assembly

Next two weeks (Apr 11 – Apr 22)

- ARDDOT – Work on the LPC, CEBAF diagnostics and the RF feedthrough

Michael Tiefenback

Previous two weeks (Mar 28 – Apr 8)

-

Next two weeks (Apr 11 – Apr 22)

-



April 14, 2022 REPORT | MAR 28 – APR 22
DIRECTOR: TODD SATOGATA

CASA Fellows

LERF - Steve Benson

Previous two weeks (Mar 28 – Apr 8)

- Held 3rd ERL 2022 SPC meeting. Came up with reasonable list of invited talks
- Submitted abstract for ARIEL workshop presentation
- Started presentation for ARIEL
- Reviewed and recommended students for SULI position
- Found a couple of publications that were not in the system and entered them
- Wrote up first part of a description of SRF needs for the EIC cooler ERL
- Specified magnet design and numbers for the EIC ERL

Next two weeks (Apr 11 – Apr 22)

- Review magnetized beam paper
- Make travel reservations for ARIEL workshop
- Review OUO materials to look for what we have to get rid of
- Finish writing up SRF needs for the ERLs
- Write up FEL prize nomination for Ying Wu
- Modify training for LERF Safety awareness
- Rewrite and submit the LOSP for User Lab 4

Andrew Hutton

Previous two weeks (Mar 28 – Apr 8)

- IPAC: I was not funded to go to IPAC2022 in Bangkok, I asked Bettina Kuske to present it. We agreed that she would prepare the slides - but that I would prepare the paper. So that will be one of my tasks in the next few weeks. All the work, but none of the pleasure! I am approaching 40% complete on this.
- Loida: I will also be helping Loida with her IPAC presentation (she is already most of the way there from her previous presentations) and also her paper. Loida has a draft and I have been suggesting changes (hopefully improvements). One thing that takes time is to identify which of the pathways that the computer program finds have already been implemented. This means a Google search for each one, which is my job. Finding an existing method is good in that it shows the program is effective at identifying useful pathways; obviously new pathways are more interesting!
- I have been offered another REU student; I contacted her but have not heard back – exams?
- Graduate school update: Lila has now been accepted at Berkeley and thinks that she will accept that offer. She will be working on isotope production - a pleasant surprise. Loida has been accepted into several universities in Florida and it looks like she will opt for Florida University. She wants the warm weather and a Hispanic student population

Next two weeks (Apr 11 – Apr 22)

- IPAC: continue working on the ERL paper and Loida's paper. Loida did not get student funding for travel to IPAC. I have applied for funding from the JSA IF program "Junior Scientist Travel Support" managed by Justin Stevens. I haven't heard back yet. If that doesn't work, I will pull the paper and submit it to NAPAC in Albuquerque. I was not funded to go to IPAC2022 in Bangkok, I asked Bettina Kuske to present it. We agreed that she would prepare the slides - but that I would prepare the paper. So that will be one of my tasks in the next few weeks. All the work, but none of the pleasure!



April 14, 2022 REPORT | MAR 28 – APR 22
DIRECTOR: TODD SATOGATA

- I am pushing Max Bruker to complete the last couple of references in the long ERL paper and then I want to submit to a Journal. At the moment, PRAB, however that will require Max to reformat everything for two columns. Ugh
- AccApp'2023: Ganapati made a proposal to Andrei that Jefferson Lab host this and that I should be a part of the LOC. Not sure if this will go through, but at least Stuart and Andrei were supportive
- Early warning: I will be on vacation for the last half of May (Mexico).