

NSTX-U Research Roles and Responsibilities

NSTX-U Research Director/Head

- Line responsibility for ES&H for the Department
- Responsible for achieving NSTX-U Research Notable Outcomes
- Responsible for achieving NSTX-U DOE / OFES Research Milestones
- Leads development of long-term NSTX-U / ST Program.
- Responsible for research assignments, performance goals, and financial planning for NSTX-U Research staff
- Responsible for organization and authorship of annual NSTX-U FWP
- Responsible for updates to mission and research milestones, as appropriate.
 - Represent NSTX-U at/for BHRC, Research Council, and LMR Meetings
- Manages NSTX-U Science Groups, Task Forces, and Working Groups, and oversees Topical Science Groups including approving final run time allocation.
- Primary contact to NSTX-U DOE Program Manager on program/research issues.
- Experimental Research Operations, Physics Analysis, and Run Coordinator support Program Director in formulation of DOE/OFES Milestones and strategic planning
- Defines programmatic requirements for Research Forum working with scientific leadership team
- Organizes the NSTX Research Forum to address programmatic requirements
- Develops research aspects of incoming collaborations, national and international
- Negotiates / approves Model Letters of Agreement (MLA) for incoming collaborators
- Oversight and approval of research aspects of collaborations with other facilities, including ITPA and BPO
- Organizes Program Advisory Committee (PAC) meetings
- Represents (or designates a representative for) NSTX-U in national and international interactions including the Fusion Facility Coordinating Committee (FFCC) and ITPA coordinating committee (ITPA-CC)
- Approves Weekly XP schedule during operations
- Responsible for the NSTX-U input for PPPL reports including the Laboratory Plan and Annual Highlights Report
- Organizes NSTX-U Team Meeting
- Organizes NSTX-U Weekly Research Reports
- Manages NSTX-U departmental administration

Deputy Research Director

- The Deputy Research Director provides assistance on Department issues as needed, and take responsibility for the Department if the Director is absent.

Head, Physics Analysis

- Line responsibility for ES&H for the Division
- Manages the Physics Analysis Division activities and insures quality of physics analysis results and their dissemination.
- Reports to Research Director
- Supports NSTX-U Research Director in formulation and implementation of DOE/OFES Milestones and strategic planning
- Participates in formulation of the short- and long-term programmatic goals of NSTX-U
- Responsible for providing physics analysis support for research team, and that physics analysis tools and data are available in convenient form for use by team in a timely fashion
- Responsible for defining computer hardware and software needs for data analysis and for information technology hardware to support off-site collaboration
- Coordinates internal peer review of presentations and journal articles and approves publications and reports
- Oversees the timely development of scientific articles by staff within the Division and supports the development of scientific articles by all members of the Department, as appropriate
- Review XP's for Physics Analysis
- Organizes weekly physics presentations of recent results
- Organizes the NSTX-U Results Review
- Organizes NSTX-U APS press releases

NSTX-U Department Administrator

- Provides administrative support to the NSTX-U Research Director and Department
- Oversees and coordinates the day-to-day activities of the NSTX-U office
- Serves as the point of contact and liaison with internal and external collaborators and visitors for NSTX-U
- Provides assistance with Laboratory, Department of Energy and University policies and procedures and ensures that the NSTX-U Research Department is in compliance with those procedures. Examples include assisting with and processing entry forms for foreign visitors to PPPL and assisting with Visa issues for NSTX-U collaborators.
- Schedules and organizes travel arrangements including entering foreign travel into the FTMS system
- Drafts incoming collaborator letters of invitation for the NSTX-U Director
- Prepares and processes Model Letters of Agreements for collaborators visiting PPPL longer than two weeks
- Organizes and facilitates meetings and special events for the Department
- Makes purchases with a government issued P-card when requested for NSTX-U

- Serves as the designated records person for NSTX-U – for example archiving NSTX-U documents on the NSTX-U Google drive.
- Updates/edits NSTX-U web-pages with concurrence of NSTX-U Research Director

Run Coordinator

- Reports to NSTX-U Research Director
- Develop proposed run-time allocations following NSTX-U Research Forum for approval by NSTX-U Directorate
- Plans daily eXperimental Proposal (XP) run schedule, coordinating with Science Group leaders.
- Runs daily meeting at the end of the shift to assess progress and adjust XP run time.
- Runs weekly meetings to discuss and schedule XPs.
- Reports on run campaign status and plans at NSTX-U weekly physics meeting.
- Approves XPs
- Ensures that XPs are developed in a timely fashion.
- Supports NSTX-U Research Director in formulation of DOE/OFES Milestones and strategic planning.

Experimental Research Operations Head

- Line responsibility for ES&H for the Division.
- Reports to the NSTX-U Research Director regarding topics in the division.
- Manages Research Operations Branch Heads with goal of completing associated work scope on-budget and on-schedule
- Provide a high-level interface between the engineering department and the physics program, including review or authorship of relevant requirements document.
- Assist in the prioritization of resources across the various activities.
- Assist the run coordinator in planning XPs and XMPs.
- Reviewing all XMPs following review by the Physics Operations branch head
- Responsible for organizing Weekly Run Planning Meeting during operations
- Oversees the timely development of scientific articles by staff within the Division.
- Supports NSTX-U Research Director in implementing ongoing NSTX-U program in order to achieve DOE/OFES Milestones.
- Leads team-wide discussions of key ongoing programmatic decisions.
- Organizes/co-organizes Run Assessment following run campaign

Research Operations Deputy

The Research Operations Deputy is to provide assistance on division issues as needed, and take responsibility for the division if the head is absent.

Branch Head Roles

Branch heads have the responsibility to:

- Provide line responsibility for ES&H for the Branch
- Provide interfaces for collaborators
- Provide engineering requirements for innovative technical projects needed by the research program
- Work closely with members of the PPPL engineering and research teams to accomplish facility enhancement and operations tasks, and provide oversight of these activities through completion.
- Work within budgetary and schedule constraints.
- Provide relevant expertise to other elements of the NSTX-U project.

Boundary Physics Operations

The branch head for Boundary Physics Operations has responsibility for:

- Interfaces, diagnostics, and R&D elements in the areas of plasma facing component (PFCs), PFC conditioning techniques, and novel plasma fueling techniques
- Oversight of the development and deployment of novel PFC conditioning and fueling techniques, as well as specific PFC and PMI diagnostics.
- Providing Boundary Physics related requirements and recommendations to other sections of the NSTX-U program and to PPPL engineering.
- Serving as the research contact, or assigning appropriate research contacts, for boundary physics related collaborators.
- Drawing on relevant expertise in ME, EE and Fabrication & Operations Divisions within the engineering department, and working with the appropriate Responsible Engineers within the Recovery Project.

Diagnostics Operations and R&D

The branch head for Diagnostics Operations and R&D has responsibility for the highest-level physics oversight and operations of all diagnostics, except those explicitly assigned to the RF Physics or Boundary Physics Operations branches. Responsibilities include:

- Ensuring that diagnostic collaborators are assigned appropriate research contacts, and that diagnostic Records of Discussion (RoDs) are completed properly
- Developing clear requirements for diagnostics to be deployed on NSTX-U
- Assisting with diagnostic configuration control (i.e. the port map) and operations
- Providing advice and oversight for diagnostics R&D. They will also provide diagnostics related advice to other elements of the program, including advice on the program letter
- Working with the Diagnostics Responsible Engineer, as well as members of the IT and engineering departments, to accomplish these goals

RF Physics Operations

The branch head for RF Physics Operations is responsible for the interface between the NSTX-U research program and Heating Systems engineers within the NSTX-U Recovery project and the Heating Systems Branch within the EE division. This includes:

- Specification of required upgrades to support the research mission and operations support for those systems
- Scoping studies for new RF systems or applications of new RF technology may be motivated and/or overseen by this branch
- Training of RF physics operators, including any requirement of training documentation
- Research contacts for RF related collaborations will generally come from this branch
- Diagnostics specifically motivated by and applied to RF systems.

Physics Operations

The branch head for Physics Operations has primary responsibility for control room physics operations. This includes:

- Ensuring that physics operators are available at all times during operations
- Ensuring that new physics operators go through proper training, including documentation of that training
- Providing first review of all XMPs
- Providing the physics operations guidance to other aspects of the project as appropriate. This may include attending design reviews or assisting with XP development.
- Authoring, or supervising the writing of, the initial commissioning XMP(s) for each run campaign.

Plasma Control System Operations

The branch head for Plasma Control Systems is responsible for:

- The reliable upgrade and operations of the Plasma Control System physics algorithms within the GA PCS
- Working with physicists and engineers to develop both requirements and testing strategies, and then assist in the testing and deployment of codes
- Drawing on relevant expertise in EE division and IT department, and working with the Instrumentation and Protection Responsible Engineer as appropriate.

Science Groups (SGs)

- Work with Research Director/TSGs to set run-time allocation guidance
- Coordinate research of TSGs within the SG – promote experiments / plans that achieve multiple scientific goals

- Critical to maximizing scientific output per shot
- “Coordinated” XPs will receive higher priority / more run time
- Inform Run Coordinator when XP is ready for final/team review
- Provide summaries and highlights of scientific progress at/for NSTX-U team meetings, FES/quarterly reviews, other venues
- Aid dissemination of results with Physics Analysis Division
 - Journal pubs, invited talks, seminars, colloquia, conferences, ITPA, BPO
- Coordinate / down-select milestone ideas from TSGs in SG
- Provide feedback / comment on annual Field Work Proposal
- Assist / report to the NSTX-U Program and Project directors

Topical Science Groups (TSGs)

- Lead brainstorming, organization, writing of 5 year plan topics
- Determine and address highest priority scientific issues through discussion and consensus at open meetings
- Organize the NSTX-U Research Forum sessions for the TSG
- Draft scientific milestone ideas utilizing expertise of the TSG
- Propose and execute experiments to achieve milestones and address priorities
- With SG leaders, define facility and theory resources to achieve research goals
- Present TSG / SG results and plans at NSTX-U PAC meetings
- Assist / report to the NSTX-U Science Group leaders
- Responsible for advertising TSG meetings to entire NSTX-U team

TSG University Representatives

- Contribute to prioritization within TSGs
 - Help decide/draft milestones, XMP/XP prioritization
 - Help identify how your tools/codes/diagnostics/personnel can contribute to the group and the larger NSTX-U program
 - Advocate for university research within your TSG and for the needs of the larger NSTX-U research program
- Advocate for your TSG research outside of NSTX-U
 - Seek input/interest from those not funded by NSTX-U
 - Particularly from your own University and other universities
 - Includes giving seminars at other Universities / institutions describing NSTX-U and/or your research
 - Note: this kind of outreach is encouraged for all NSTX-U team-members
- Help identify best tools for remote participation, and remote experimentation

Task Forces (TFs)

- Address specific operational and/or scientific goal that cuts across or impacts multiple SGs / TSGs
- Goal must be very high priority within research program
- Receives dedicated run-time, and has dedicated session at Research Forum
- Similar to a TSG, but may not necessarily have theory/modelling or university representatives – depends on duration or scope
- Organizes experimental proposals to achieve goal
- Finite duration - nominally 1-2 years, renewable if necessary
- TF leadership should nominally have a leader and a deputy, and should include at least 1 collaborator if possible
- Reports directly to Research Director

Working Groups (WGs)

- Respond to specific programmatic or technical charge from Research Director
- Addresses issues that cross-cut more than one SG or TSG
- Nominal lifetime = 1-2 years, can be extended/renewed
- Provides points of contact between NSTX-U and other groups as necessary (e.g. PPPL theory, FESAC, ITPA, ITER)
- Does not have dedicated NSTX-U run time, but provides recommendations on XP prioritization, other resource needs
- WG leadership should nominally have a leader and a deputy, and should include at least 1 collaborator if possible