# Pedestal Structure & Control TSG
Open Discussion

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NSTX-U Pedestal Activities
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Coll of Wm & Mary
Columbia U
CompX
General Atomics
FIU
INL
Johns Hopkins U
LANL
LLNL
Lodestar
MIT
Lehigh U
Nova Photonics
Old Dominion
ORNL
PPPL
Princeton U
Purdue U
SNL
Think Tank, Inc.
UC Davis
UC Irvine
UCLA
UCSD
U Colorado
U Illinois
U Maryland
U Rochester
U Tennessee
U Tulsa
U Washington
U Wisconsin
X Science LLC
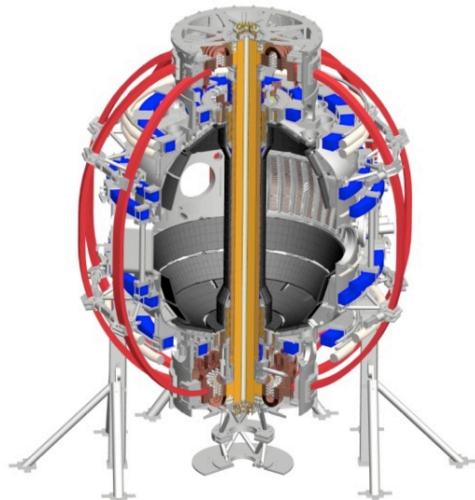
Culham Sci Ctr
York U
Chubu U
Fukui U
Hiroshima U
Hyogo U
Kyoto U
Kyushu U
Kyushu Tokai U
NIFS
Niigata U
U Tokyo
JAEA
Inst for Nucl Res, Kiev
Ioffe Inst
TRINITI
Chonbuk Natl U
NFRI
KAIST
POSTECH
Seoul Natl U
ASIPP
CIEMAT
FOM Inst DIFFER
ENEA, Frascati
CEA, Cadarache
IPP, Jülich
IPP, Garching
ASCR, Czech Rep

NSTX-U capabilities for first year campaign

- ## Facility capabilities
  - RWM coils; boronization (and later lithium); standard core fuelling; SGI

- ## Diagnostics
  - 42-Channel MPTS,CHERS with Beam 1, filterscopes, tangential ME-SXR, BES, Up & Down SXR, Reflectometer, tangential bolometer, magnetics for EFIT reconstruction, LADA in bolometer mode, MSE.

- ## Useful machine parameters
  - Ip = 0.5 - 1.5 MA, Bt = 0.5 - 0.75 T, PNBI = 4 - 12 MW, $0.3 < \delta < 0.8$

- ## Analysis tools
  - Python tools refurbishment (Osborne & Canal will be visiting PPPL in Feb.)

Brainstorm on NSTX-U PED research topics for FY 15 (I) Early in the run (first 2months of operations)

1. H-mode access and power threshold (L-H transition physics with T&T)

2. Characterize the H-Mode pedestal structure at increased BT, Ip, and NBI heating power, and triangularity, DN vs LSN
   - Generate database for testing EPED on ST and for gyrokinetic codes
   - Pedestal structure and evolution after L-H transition and between ELMs
   - Turbulence characterization to understand the pedestal dynamics
   - Determine the pedestal scaling with beta_pol
   - Map out the stability diagram for three Ip and 2 shaping parameters

3. Identifying common characteristics in the phenomenology of different ELM types
   - Effect of (Boron)-Granule-Injection for increasing the ELM frequency

4. Exploit the transition from Boronized PFCs to lithium coatings *(if this transition occurs early)*
   - Compare ELMy-H mode in Boron vs Li
   - Document the pedestal structure impact during the transition Boronized - > Lithiated

Brainstorm on NSTX-U PED research topics for FY 15 (II)

- Mid through late run
  - Refine pedestal characterization with high triangularity discharges
  - Document transition from ELMy-ELM-free transition and then scan in Li ELM-free
  - Investigate/characterize ELM-free regimes such EPH mode, I-mode
    - Document transition frtin ELMy-ELM-free transition and then scan in Li ELM-free.
  - Pedestal destabilization physics using LGI in ELM-free regimes
  - Develop optimum discharges for simulation-experiment comparison in pedestal region
    - Discuss with theory team for adequate discharges for simulations
    - Optimize cross-diagnostics (BES, GPI, reflectometry, and probes) in the edge region

- Other pedestal relevant topics are welcome