
Community Input on Plasma Materials Interactions

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Status Update
20-March-2015

Goals and Approach (1/3)

- Leverage foundational information developed during the 2009 ReNeW activity and recent FESAC evaluations
 - obtain updated community input in order to identify potential innovations or understanding that may have emerged over the past 6 years
- Re-evaluate the 1) scientific challenges, and 2) options for handling those challenges associated with ReNeW thrusts #9-12
 - PFC-relevant materials issues discussed in ReNeW thrust 14 will be included in the updated analysis of ReNeW thrust 10

ReNeW thrust #	PMI topic	Panel leader, deputy
9	Scrape off layer/divertor physics	H.Y. Guo (GA), B. LaBombard (MIT)
10	PMI and long pulse divertor simulators, incl. synergistic neutron damage effects to PFCs	J.P. Allain (UIUC), R. Doerner (UCSD)
11	Engineering science innovations for plasma exhaust challenges	C. Kessel (PPPL), D. Youchison (SNLA)
12	Plasma core-edge integration	A. Hubbard (MIT), T. Leonard (GA)
	Cross-cutting research initiatives	R. Maingi (PPPL), S. Zinkle (UT-K), D. Hill (LLNL), D. Hillis (ORNL), J. Menard (PPPL), D. Whyte (MIT)

Goals and Approach (2/3)

- Research community input will be solicited via 2-page white papers and a 3-day research community from May 4-6
- We will fully utilize valuable archived community input including
 - 2009 ReNeW report documentation
 - 2012 FESAC report and white papers on “Materials Science and Technology Research Opportunities Now and in the ITER Era”
 - 2012 Fusion Nuclear Science Pathways Assessment report (PPPL)
 - 2013 FESAC report and white papers on “Prioritization of Proposed Scientific User Facilities for the Office of Science”
 - 2014 FESAC report and white papers on “Strategic Planning”

Goals and Approach (3/3)

- The workshop will mainly consist of 4-5 parallel breakout sessions (6 total four hour time blocks) for the panels to
 - Identify ~10-15 high-priority scientific challenges in PMI (“priority research directions”, PRDs)
 - Discuss options to address these challenges
 - Anticipate extra 0.5-1.5 plenary sessions for cross-cutting proposals
- No prioritization among the identified “PRDs”, but the scientific merits will be outlined, as well as time sequencing, if relevant
- Pros and cons of various potential approaches to address the PMI science challenges will be discussed (but no formal panel recommendations on preferred pathway), including
 1. Upgrades to existing facilities
 2. Computation and validation
 3. International collaborations
 4. New starts

Present Status

- Workshop website has been set up by the USBPO, including a link for submission of white papers, talk requests, and talks at the Workshop:
 - <https://www.burningplasma.org/activities/?article=Plasma-Materials%20Interactions>
- Workshop venue and dates have been established:
 - May 4-6 (M-W), 2015 at PPPL
 - Registration for site access needed: www.pmi2015.pppl.gov, site will go live by 3/27/15
 - Panelists will stay for an additional ½ day on May 7 to prepare/continue initial outline of the workshop report (see last page for list)
- Final workshop report is due to DOE by June 30, 2015
- Panel leads and deputies have started to reach out to the research community to obtain initial input
 - All sub-panels are open to research community input, as is participation in the May workshop
 - Panel membership has been established, conference calls have started
 - Anticipate monthly conference calls within the Executive Group
 - There may be a one day checkpoint meeting (VC or face-to-face, TBD) with the Executive Group of the Workshop in June, to gauge progress toward the report
 - It is anticipated the preliminary workshop findings will be broadly disseminated to the community in June, most likely via a Webinar

Important Dates

Date	Activity	Participants
Feb. 18	Sub-panel kickoff videoconference	Workshop and sub-panel leads and co-leads
March, April	Sub-panel organization and conference calls as needed	Sub-panel leaders and members
April 17	Deadline to request talk at workshop (BPO site), to submit white paper (BPO site), and to register for site access to PPPL (PPPL website)	Community
May 4-6	Workshop on PMI at PPPL, Princeton, NJ	Leaders and sub-panel members invited. Others may request attendance on a first-come, first-serve basis. There is a limit on total costs to National Lab and federal employees.
May, June	Prepare report, submit completed report (June 30 deadline)	Leaders and Sub-panel members

Present Sub-Panel Membership (“Panelists”)

SOL & divertor physics (ReNeW Thrust #9):

- Leader/Deputy: H.Y. Guo (GA), B. LaBombard (MIT)
- Panelists: R. Goldston (PPPL), I. Hutchinson (MIT), S. Krashenninikov (UCSD), J. Myra (Lodestar), V. Soukhanovskii (LLNL), P. Stangeby (U. Toronto), P. Valanju (U. Texas), X. Xu (LLNL)

PMI and long pulse divertor simulators, including synergistic neutron damage effects to PFCs (ReNeW Thrust #10 and part of #14):

- Leader/Deputy: J.P. Allain (UIUC), R. Doerner (UCSD)
- Panelists: M. Jaworski (PPPL), R. Kolasinski (SNLL), R. Kurtz (PNNL), J. Rapp (ORNL), B. Wirth (UT-K)

Engineering innovations for plasma exhaust challenges (ReNeW Thrust #11)

- Leader/Deputy: C. Kessel (PPPL), D. Youchison (SNLA)
- Panelists: J. Blanchard (UW-M), R. Callis (GA), R. Ellis (PPPL), R. Majeski (PPPL), N. Morley (UCLA), D. Ruzic (UI-UC), M. Tillack (UCSD), S. Wukitch (MIT), M. Yoda (GIT)

Core-edge integration (ReNeW Thrust #12)

- Leader/Deputy: A. Hubbard (MIT), T. Leonard (GA)
- Panelists: J. Canik (ORNL), M. Kotschenreuther (UT-A), R. Majeski (PPPL), P. Snyder (GA), J. Terry (MIT), Z. Unterberg (ORNL), R. Wilson (PPPL)

Cross-cutting group for overlaps among panel proposals:

- R. Maingi (PPPL), S. Zinkle (UT-K), D. Hill (LLNL), D. Hillis (ORNL), J. Menard (PPPL), D. Whyte (MIT)