



# Taming The Plasma Material Interface

## ReNeW Theme 3

March 4, 2009

M. Ulrickson  
Theme Chair



# Outline

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- **Workshop Overview**
- **Introduction of Vice-Chair and Panel Chairs**
- **Goals of the Workshop**
- **What is a Research Thrust?**
- **Steps after the Workshop**



# WELCOME



# Workshop Overview I

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- **Wednesday Morning**
  - Joint session with the Extracting Fusion Power Theme (already completed)
- **Wednesday Afternoon**
  - Panel Chairs introduce their panel topics
  - Joint session for research thrust presentations
- **Thursday Morning**
  - Parallel panel workshops to discuss research thrusts in each topic



# Workshop Overview II

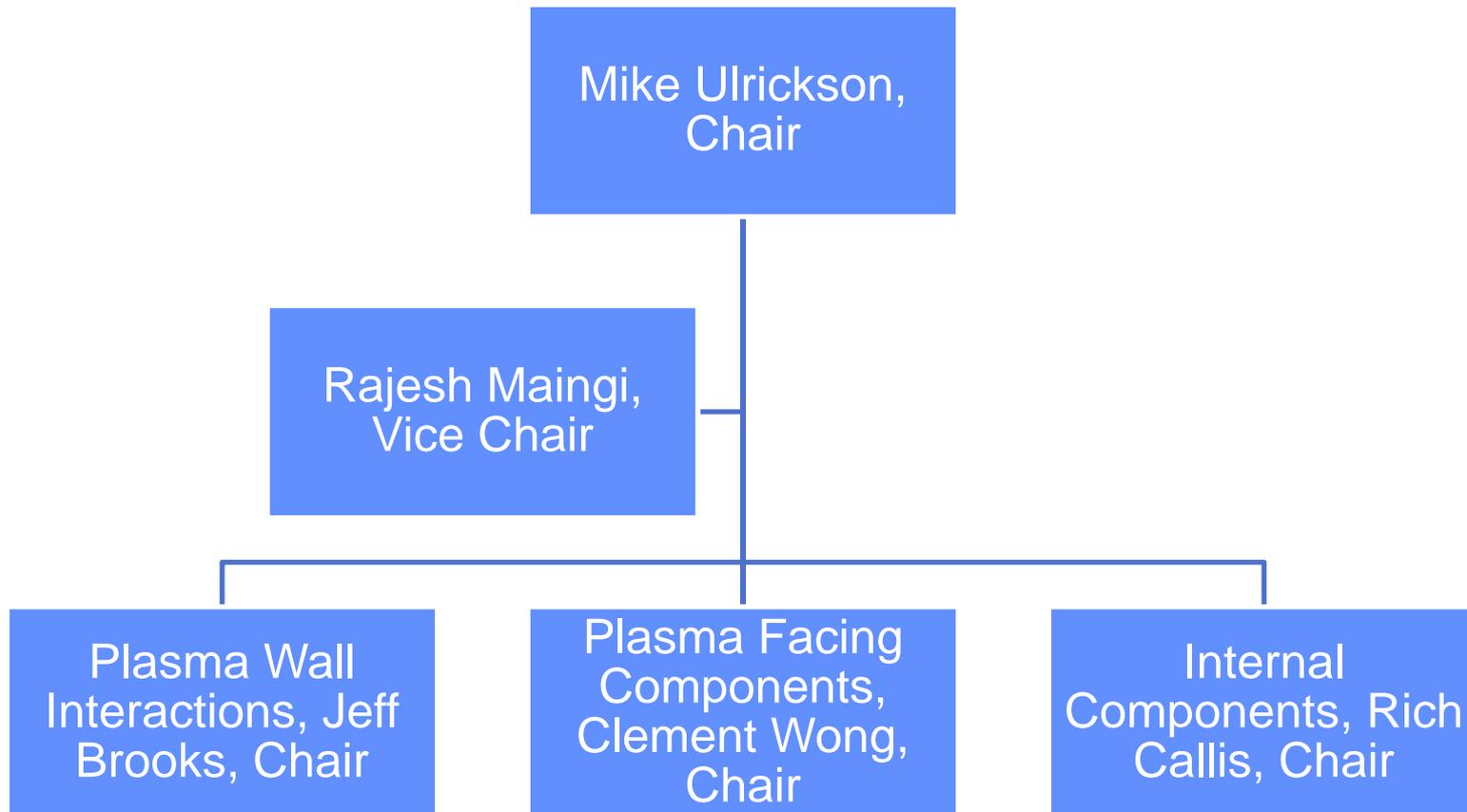
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- **Thursday Afternoon**
  - **Completion of the parallel sessions**
  - **Joint session for additional thrust presentation**
  - **Brief Panel working session to organize Friday**
- **Friday Morning**
  - **Group discussion of the potential thrusts in each topic**
- **Friday Afternoon**
  - **Panel working sessions to refine and condense thrusts**



# Taming Plasma Materials Interactions

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# Plasma Wall Interactions Panel

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- **Jeff Brooks, Chair**
- Jean Paul Allain
- Rob Goldston
- Don Hillis
- Mike Kotschenreuther
- Brian Labombard
- Tom Rognlien
- Peter Stangeby
- Xianzhu Tang



# Plasma Facing Components Panel

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- **Clement Wong, Chair**
- Russ Doerner
- Tony Leonard
- Bruce Lipschultz
- Dick Majeski
- Brad Merrill
- Stan Milora
- Dennis Youchison



# Internal Components Panel

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- **Rich Callis, Chair**
- John Caughman
- Jim Irby
- Tom Jarboe
- Jim Leuer
- Tony Peebles
- Dave Rassmussen
- Lance Snead
- Dennis Whyte
- Randy Wilson



# Panel Presentations

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- **Each Panel Chair will present the research needs for their topic**
- **A starting list of potential research thrusts will be presented to provide context and examples of what could be considered. This list presented is not final in any sense. There is no intention of preselecting any thrusts. We are actively seeking more ideas, better ideas, etc.**



# Goals of the Workshop

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- **Assemble a set of strategic plans called research thrusts that will bridge the gaps identified by the Greenwald panel over the next twenty years for the PWI theme.**
- **We seek input from the fusion community to acquire the broadest set of activities and have the greatest chance of success in bridging the gaps.**
- **The thrusts should have several time spans**
  - **Near term (~5 years)**
  - **Medium term (~10 years)**
  - **Long term (~20 years)**



## Goals of the Workshop II

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- **We are to assume that ITER will be built and will achieve its research goals in our planning.**
- **The aim is to be ready to proceed with a DEMO like device.**



# What is a Research Thrust?

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- **A research thrust describes a set of work that will advance our knowledge and capability from the present state to the state desired for fusion energy.**
- **A thrust may describe the whole path to the future (large) or smaller steps that advance the technology readiness level one step at a time (small).**
- **A thrust will describe the tools and work needed to make progress (equipment, theory and modeling, research plan, etc.)**



## What is a Research Thrust? II

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- **Research thrusts may require new or improved equipment, new or improved theory or modeling, or may be able to be accomplished using existing capabilities.**
- **The output of the workshop will be only crudely defined thrusts.**
- **The panels will refine the thrusts between the workshop and the June final workshop. Please visit the ReNeW website frequently to view progress and make comments.**



# A Research Thrust is Not

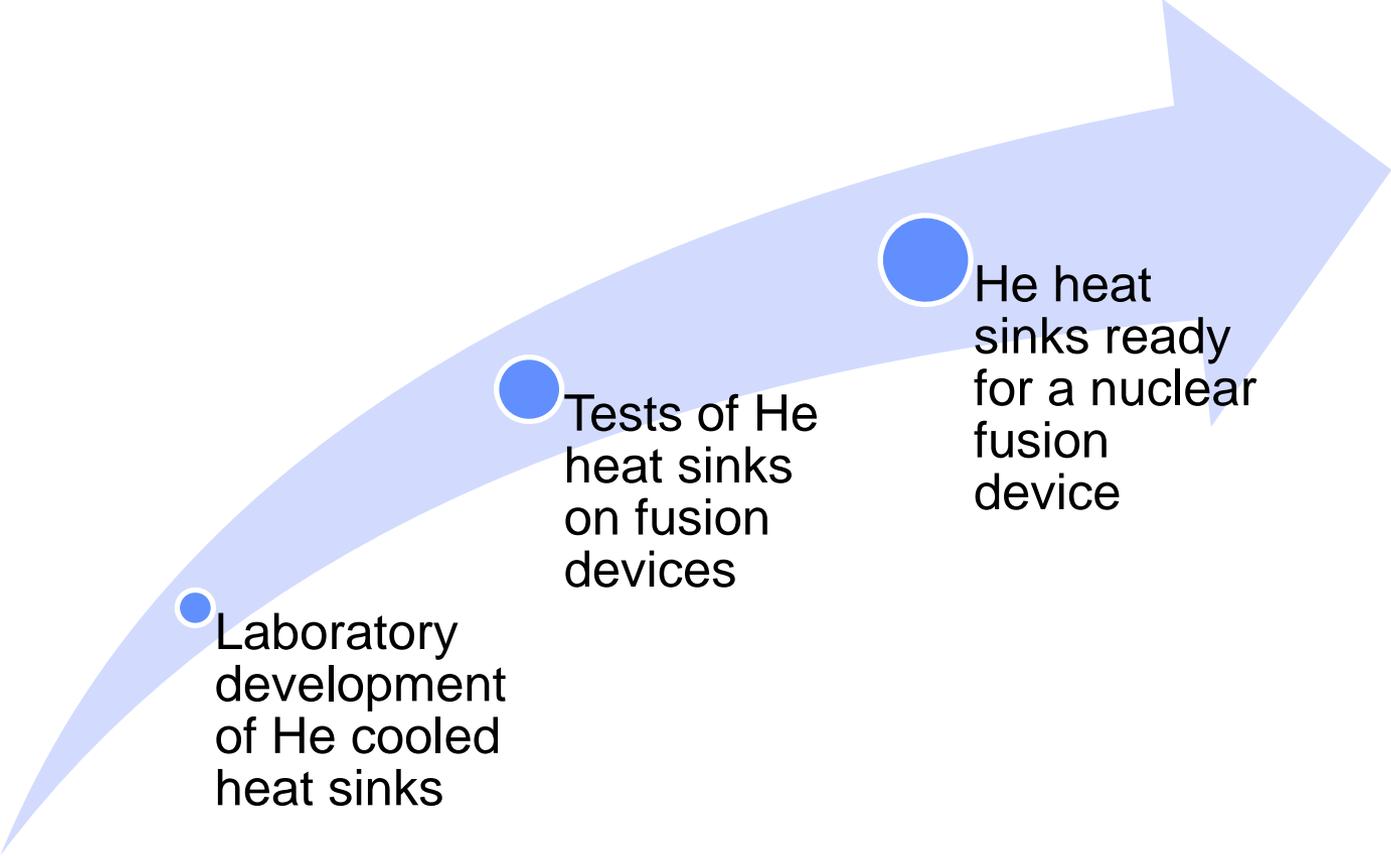
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- **An endorsement of a particular device proposal**
- **An endorsement of an upgrade to an existing facility**
- **An endorsement of a theory or modeling initiative**
- **A cost estimate for particular work (sufficient detail must be provided to estimate the cost)**



# Research Thrust I

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Laboratory development of He cooled heat sinks

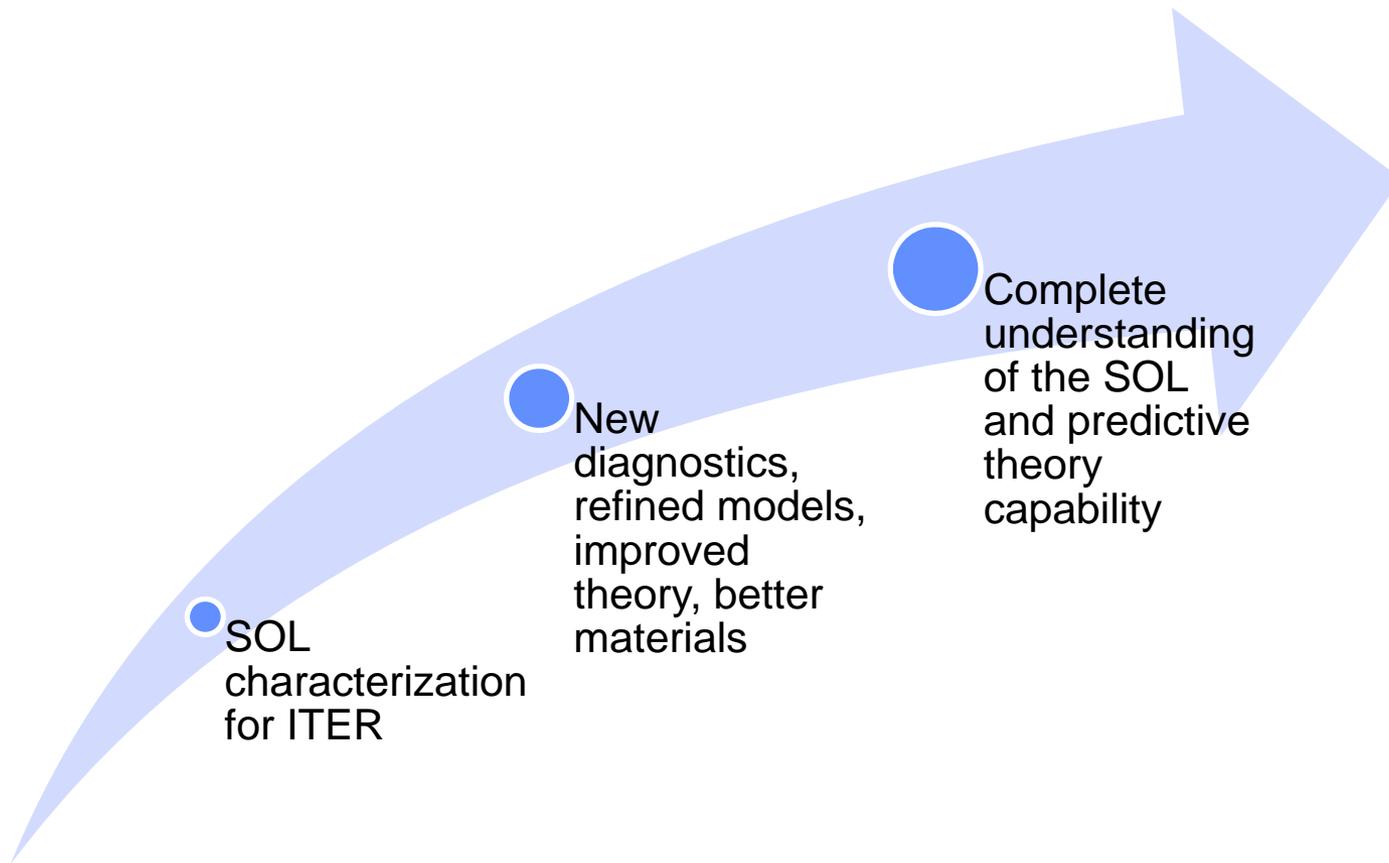
Tests of He heat sinks on fusion devices

He heat sinks ready for a nuclear fusion device



# Research Thrust II

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## Steps after the Workshop

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- **The panels will refine the thrusts to make them more coherent and complete, and look for logical combinations.**
- **Revised draft thrusts will be posted on the ReNeW website for comment and feedback.**
- **A refined set of thrusts will be discussed by the executive committee in early May.**
- **Further revision of the thrusts will be done before the June workshop.**



# Summary

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- **During this workshop, you will hear approximately 40 presentations on ideas for research thrusts that are intended to advance the understanding and capability of plasma material interactions that will enable a DEMO like device.**
- **Ample time will be allowed for discussion and input from the attendees is encouraged and welcomed.**
- **This is the start of a process for creating a few thrusts that will enable DoE to request strategic funding for crucial research.**