SNOWMASS Inertial Fusion Concepts Working Group

(5-24-99)

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SNOWMASS Inertial Fusion Concepts SUBGROUP LEADERS

(3-30-99)

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maybe

SNOWMASS Inertial Fusion Concepts Working Group
Agenda
(Draft 6-4-99)

Subgroup 1: **Targets**

Max Tabak (LLNL), Jill Dahlburg (NRL), Rick Olson(SNL)

Topic 1A: Leader: **Max Tabak**

What are the key scientific issues for validating each target concept, and how can they be resolved?

Speakers to initiate discussions on concept, advantages, issues, and how to resolve them:

Indirect drive……..John Lindl
Direct drive……....Jill Dahlburg
Fast igniter……Michael Key
Magnetized targets….Irv Lindemuth
Other concepts……

Topic 1B: Leader: **Jill Dahlburg**

How can existing (and new?) facilities be used to test each concept?

Speakers to initiate discussions on how facilities can be used:

NIF…….John Lindl
Omega……Richard Town
NIKE……..Jill Dahlburg
Z…….Rick Olson
Atlas……...…Irv Lindemuth
GSI (Dieter Hoffman).Max Tabak
Other facilities…….

Topic 1C: Leader: **Rick Olson**

What IFE target physics issues will not be resolved on NIF?
What is required to get to high yield? What is the significance to
IFE of experimentally demonstrating high yield/high gain?

Speakers to initiate discussions on:
Indirect-drive target issues not resolved on NIF…Max Tabak
Direct-drive target issues not resolved on NIF…..Richard Town
What's required to get high yield (ZX, X-1)……..Rick Olson
What's required to get high yield (NIF Upgrade)..Mark Herrman
High yield/high gain demonstration not needed…John Lindl
High yield/high gain demonstration needed……..Jeff Quintenz
Other options…….

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Subgroup 2: **Drivers and Standoff**

Leaders: **Steve Payne (LLNL), John Barnard (LBNL/LLNL),**
John Sethian (NRL), Rick Spielman (SNL)

Topic 2A: Leader: **John Sethian**
How can the source brightness, beam uniformity, pulse shaping
accuracy, efficiency, reliability, repetition rate, and cost of each
driver concept be improved?

Speakers to initiate discussions on:

HIF……...John Barnard
LIF……Mike Cuneo, Steve Slutz
DPSSL……..Camille DeBall, Josh Rothenburg
KrF……John Sethian
Z-pinch……..Rick Spielman
Liner drivers……..
Other concepts…..

Topic 2B: Leader: **John Barnard**

What are the key standoff issues for each driver scenario and how can they be addressed? (e.g., final optics for lasers, final transport and focus for laser beams, final focus magnetic lenses for heavy ion beams, final transport and focus for ion beams, power feed for rep-rated z-pinches, …)

Speakers to initiate standoff discussions on:

HIF……
LIF…….Craig Olson
DPSSL and KrF….Steve Payne, John Sethian
Z-pinch …….Mark Derzon
Liner drivers……...
Other concepts……

Topic 2C: Leader: **Rick Spielman**

What would convincingly demonstrate that each driver concept is a viable driver candidate for IFE? Specifically, what is a convincing Integrated Research Experiment (IRE) for each driver candidate?

Speakers to initiate discussions on:

HIF……...Roger Bangerter
LIF……...Mike Cuneo
DPSSL…….Howard Powell
KrF……...John Sethian
Z-pinch…….Rick Spielman

MTF…….
Other concepts…….

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Subgroup 3: **Inertial Fusion Power Plant Concepts**

Ken Schultz (GA), Robert Peterson (U. Wisconsin), Per Peterson (UCB)

Topic 3A: Leader: **Robert Peterson**
What are the key IFE power plant concepts, advantages, and Issues?

Speakers to initiate discussions on:

HIF reactor concepts…….Ralph Moir
LIF reactor concepts……..Robert Peterson selects
DPSSL reactor concepts……
KrF reactor concepts…….
Z-pinch reactor concepts…...Rick Spielman
MTF reactor concepts…..….
Other concepts……..

Topic 3B: Leader: **Per Peterson**
What are the key scientific issues for the fusion chamber (e.g., first wall protection, …), and what are the proposed solutions? What experiments could be done to test the relative merits of these solutions?

Speakers to inititate discussions on:
Chamber concepts summary…Mark Tillack
Chamber dynamics for IFE…..Robert Peterson
Chamber materials for IFE…..Edward Bloom
Liquid hydraulics…….Per Peterson
Neutronics, activation, safety..Jeff Latkowski

Chamber development path….Wayne Meier
Other issues……

Topic 3C: Leader: **Ken Schultz**
What are the issues in target fabrication, target characterization, target injection, target robustness (e.g., tolerances), and what is the path for addressing them?

Speakers to inititate discussions on:
Target physics requirements…..Max or Debbie or ?
Target fabrication issues……Warren Steckle
Target injection issues……Godfrey Basenbruck
Possible development paths……Ken Schultz
Other issues……

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Subgroup 4: **IFE Metrics and Development Paths**

Wayne Meier (LLNL), John Perkins (LLNL)

Topic 4A: Leader **(Wayne Meier)**
What are the metrics for an entire IFE system for each step of development (e.g., concept exploration, proof of principle, proof of performance, fusion energy development, DEMO, attractive commercial fusion power plant)? How are these incorporated into the IFE Road Map? How do we insure that there is a mechanism in place for new concepts to initiate a development path?

Speakers to initiate discussions on:

Metrics……
IFE Road Map……
Mechanism for new concepts…

Topic 4B: Leader **(John Perkins)**

What is the status and development path of each present IFE scenario?

Speakers to inititate discussions on:

HIF development……..
DPSSL development……
KrF development…….
Z-pinch development……
MTF development……
Other concepts…….

SNOWMASS Inertial Fusion Concepts Working Group
Draft Schedule (6-12-99)

Monday (7-12-99) PLENARY (all Working Groups)

Tuesday (7-13-99) Morning: Plenary (20 minutes)
Parallel Subgroups (3 hours)
Room 1: (1A) Targets
Room 2: (2A) Drivers
Room 3: (3A) Reactors

Wednesday (7-14-99) Morning: Plenary (20 minutes)
Parallel Subgroups (3 hours)
Room 1: (1B) Facilities
Room 2: (2B) Standoff
Room 3: (3B) First Wall

Thursday (7-15-99) Morning: Plenary (20 minutes)
Parallel Subgroups (3 hours)
Room 1: (1C) High yield/high gain
Room 2: (2C) IRE
Room 3: (3C) Target fabrication & injection

Friday (7-16-99) Morning: Plenary
(4A) Metrics (60 min)
(4B) Pathways (60 min)
Develop interim conclusions for Monday:
Targets Subgroup (20 min)
Drivers Subgroup (20 min)
Reactors Subgroup (20 min)
Metrics Subgroup (20 min)
List issues for further discussion (10 min)

weekend Work on interim reports and writing

Monday (7-19-99) PLENARY (Interim reports from all Subgroups)

Tuesday (7-20-99) Morning: Plenary (30 minutes):
Discussion of Monday results
Parallel subgroups (3 hours)
Room 1: Targets
Room 2: Drivers & Standoff
Room 3: Power Plants
Room 4: Metrics

Wednesday (7-21-99) Morning: Plenary (3.5 hours):
Final Discussion on all topics
Develop Working Groups conclusions
Final instructions on writing

Thursday (7-22-99) PLENARY: Working Groups Results and Discussion

Friday (7-23-99) PLENARY: Final Working Group Presentations (half-day)

Issues from Inertial Concepts Group

(1) Flow for this group would be better if Monday Plenary (2nd week) were on Tuesday (2nd week).

(2) Should Magnetized Target Fusion (MTF) be in Emerging Concepts and/or Inertial Concepts?

(3) IFE Reactors in our group overlaps Technology Group.

(4) Where do requests for new concepts go? (e.g., F. Winterberg)

(5) Will repetitive pulsed power be in the Technology Group?

(6) Rooms:

Requested:	Assigned:
room for 100	tent for 100
room for 35	use tent
room for 35	room for 55
room for 35	condo for 15
room for 35	condo for 15