How to get the most out of the 1999 Fusion Summer Study?

Snowmass, CO July 11-23, 1999

You and your fellow participants of the Fusion Summer Study will be performing the work of Snowmass and producing its results. In order to make your efforts most effective, you should understand the overall objectives of the Workshop and the organization of the working groups and the subtopical discussion groups.

This note offers some suggestions to help guide you, and it explains the process we will follow to try to achieve the objectives of the Workshop. This note does not present any technical material related to the topics to be discussed at Snowmass. You'll find topical information on our web site,

`http://www.pppl.gov/snowmass.`

Instead,the intention of this note is to help the participants of Snowmass work together for a common purpose: the better understanding of the key issues of fusion energy science and the opportunities to address these issues during the next decade.

The Objectives of the 1999 Fusion Summer Study

From our *Prospectus*:

Opportunities and Directions in Fusion Energy Science for the Next Decade

The U.S. fusion energy community is now developing a coherent plan for the next decade. This plan will include paths for both energy and science goals, address the needs for both magnetic and inertial fusion options, and take into account related international programs.

To provide input to this plan, individuals involved with fusion research are **invited to come together to interact with each other** and to **develop a scientific and technical basis for consensus** on:

- The **key issues** for plasma science, technology, and energy and environment for fusion energy development.

- The **opportunities** and potential contributions of existing and possible future facilities and programs to reduce fusion development costs and achieve attractive economic and environmental features.

The workshop will be **open to all members of the international fusion science and technology community** including experts in all approaches to magnetic and inertial fusion energy.

The Objectives of the 1999 Fusion Summer Study

The quotation from our *Prospectus* has six key phrases:

1. "To provide input to this plan. . ."

   Snowmass will provide technical and scientific input to the plans being developed by FESAC, SEAB, and the NRC. (But, we will *not* be doing the work of these committees. No program budgets or pie charts allowed!) We are explaining to these committees the key issues in our field and the opportunities to address them *from our points of view*.

2. ". . . invited to come together to interact with each other. . ."

   This is the first time a wide representation of the fusion community will meet in an open workshop to discuss the future directions of the field.

3. ". . . develop a scientific and technical basis for consensus. . ."

   As much as possible, the focus of Snowmass is on the underlying science and technology. During our summaries and reports, we should provide a scientific and technical justification for our statements.

4. "Key Issues"

   By the end of Snowmass, we should be able to articulate to the general fusion community a limited list of "key issues" and explain: (1) why these issues are key and "important," and (2) how resolution of these key issues will advance fusion energy science.

5. "Opportunities"

   An "opportunity" refers to existing and possible future facilities and programs. We should assess how an "opportunity" addresses the key issues, and we should explain our assessment to others in a scientific or technical way.

6. "Open to all members of the international fusion science and technology community"

The Three Deliverables of the 1999 Fusion Summer Study

1. "Bring together individuals involved with fusion research to interact with each other and to work to develop a scientific and technical basis for consensus. . ."

2. We provide technical and scientific input to FESAC, SEAB, and the NRC (1) by our oral presentations, and (2) by direct participation of committee members in Snowmass.

3. Publish a technical proceedings of the activities of the Fusion Summer Study in order to provide a written record of our work.

   The *Proceedings* comprise the written summaries of:

   - Working groups, authored by the working group convenors,
   - Subtopical discussion groups, authored by the contributing participants, and
   - Contributed reports, authored by individuals and groups. (Contributed reports from individuals are limited to six pages. Contributed reports from groups are limited to 24 pages.)

   Written summaries need to reflect accurately the views of your working and subtopical groups.

   The main audience for the *Proceedings* is the fusion community itself; however, the working group reports should be readable by the general scientific community.

The Working Groups

The work of the Fusion Summer Study is organized into two types of working groups:

- **Fusion concept working groups (meeting in the mornings).**

  The three fusion concept working groups provide a forum for experts of related approaches to fusion to work together and identify the important issues to be faced for concept development during the next decade. These groups are:

  - Magnetic Confinement Fusion Concepts,
  - Inertial Confinement Fusion Concepts, and
  - Emerging Fusion Concepts.

- **Cross-cutting issues working groups (meeting in the afternoons).**

  The three cross-cutting working groups address topics of general importance often emphasizing those issues in common to more than one fusion concept. These working groups are:

  - Technology Issues,
  - Plasma Science, and
  - Energy Issues.

Subtopical Discussion and Integration within the Working Groups

In order to be able to present a report of discussions and working group conclusions by the end of the summer study, we will follow an open, two-step process.

During the first week, subtopical discussion groups prepare answers to key questions pertaining to fusion's next decade. These questions were selected by the working group convenors in order to focus and to facilitate discussions. The schedules of presentations within the working groups and within the subtopical discussion groups have been determined by the convenors in conjunction with subgroup participants. After the weekend, representatives from each of the six working groups will report progress and any interim findings during plenary sessions on Monday, July 19.

During the second week, the subgroups and working group convenors (1) work to resolve remaining issues and concerns raised during the midweek plenary, and (2) integrate the subgroup reports into six working group reports. These working group reports will be presented and thoroughly discussed on Thursday, July 22.

On the final day of the the Fusion Summer Study, the working groups will present final summary reports to members of FESAC and representatives from DOE/OFES.

Participating in Subtopical Discussion Groups

The working group convenors have organized subtopical groups to facilitate discussion and analysis of the relevant key issues and opportunities for each working group. These subtopical discussion groups are intended as the primary focus of activities at the Fusion Summer Study.

Every participant attending Snowmass is free to attend any and all discussion sessions. However, those participants who devote most of their efforts to a single morning and/or a single afternoon subgroup are referred to as "contributing participants."

Contributing participants of subtopical discussion groups work closely with the working group convenors to prepare the oral and written summaries of the Summer Study. These reports become the permanent record of the conclusions of our work and discussion. They also serve as the basis of our final reports which will be presented on the last day of Snowmass.

In order to make most effective use of everyone's time and effort, contributing participants of a subtopical group must be present and take an active role in the subgroup's discussions. For this reason, you may be a contributing participant to at most one morning subtopical group and at most one afternoon subtopical group.

Contributing participants of the subtopical discussion groups should have worked prior to arrival at Snowmass and assisted with the gathering of materials, including topical white papers and summaries of key issues. The working group convenors and session leaders for the subtopical groups will be posting most of this information on the WWW and on the working group information areas at Snowmass.

Ground Rules for Discussion Groups (I)

Each working group has defined a general topical schedule and focus. Most working groups have also scheduled short overview talks to provide background information and to set the stage for subtopical discussions.

When you begin your subtopical discussions, *first agree upon your ground rules*. For example,

- One speaker at a time.
- Listen.
- Keep your comments brief and focused.
- Be candid and *constructive*.
- Focus on the crucial issues.

Make sure everyone understands the need to emphasize discussion over prepared talks and to recruit everyone's constructive input instead of letting a few dominate.

Add or change these rules, but agree and "own" your discussion ground rules. Your ground rules will help you get the most out of your discussions in preparation for the synthesis and summary phase.

Ground Rules for Discussion Groups (II)

Second, agree upon your agenda. The recording secretary for each subgroup should make a list of topics to be addressed by your subgroup and identify a limited number of topics of great interest to most participants.

When there are points of disagreement, assign “homework tasks” to responsible individuals and ask for a presentation of both sides of the issue on the following day.

Keep your subtopical discussions on track. Be aware of the general charge to each working group:

- Describe the “key issues” to be faced during the next decade of fusion energy science research. Why are these issues important and how will resolution of these issues advance fusion energy science?

- Assess and define the opportunities and potential contributions of existing and possible future facilities and programs to address these issues. Explain in a scientific or technical way how an “opportunity” addresses your key issues.

Consider how the work of your subtopical discussion group will contribute to the overall report of your working group.

Summarize areas of significant agreement and areas of significant disagreement.

Preparing Mid-Workshop Working Group Status Reports

The purpose of these Mid-Workshop reports (on Monday, July 19) is to communicate the status of your working groups.

- Try to generate enthusiasm and interest for your topics, but, do not give a technical “review” of a subdiscipline.

- Try to summarize progress identifying “key issues” and assessing “opportunities.” But, you do not need to present preliminary “conclusions” or “recommendations”.

- Mention those topics which generated discussion and debate. If contested issues arise, the mid-week reports should give both sides of the argument.

- Each working group would have approximately one hour within which to present their reports, and

  Each working group is responsible for for preparing their own mid-week summary.

- A few key leaders (typically the subgroup leaders) of your working group should speak. Make references to your posters and materials where participants can get further information.

- Plan on at 20 minutes of discussion and 40 minutes of prepared presentation.

Finally, each speaker will be held to a **VERY STRICT** time schedule. Don’t put your main points at the end of the presentation; they might not be heard.

Using “Chits”

Although the Fusion Summer Study is organized to encourage interactions and discussions among relatively small groups of 10-30 people, you are also encouraged to respond to the more formal plenary presentations scheduled by the organizing committee and the working groups.

Questions and comments during plenary sessions should be brief and constructive.

More detailed questions and comments should be written on “chit forms”. Blank “chit forms” (like the one attached on the following page) will be distributed at registration to all participants and available at all plenary sessions. The top of each chit indicates the group, or groups, to whom the chit should be directed.

During the main plenary sessions (July 12, 19, and 22), you should drop the chit forms in the designated boxes at the back of the conference room. The staff of the Summer Study will make copies and distribute them to the appropriate working groups and subtopical groups. At other times, you may give the chit directly to a working group convenor or subgroup discussion leader or you may drop the chit form off at the Workshop Office or at the end-of-the-day social hour.

We will not have the time to respond individually to every chit submitted to working groups and subgroups. However, the use of chits will be an important part of the Snowmass process. They will significantly increase the communication between parallel working groups and provide a simple mechanism for each participant to contribute detailed action items to the technical discussions.

Snowmass 1999
Fusion Summer Study

CHIT

Check Appropriate Items:

- ❑ Plenary
- ❑ Working Group
- ❑ Midweek Report
- ❑ Thursday Summary

- ❑ Comment
- ❑ Issue
- ❑ Recommendation

- ❑ Technology Issues
  - ❑ Chamber Science & Technology
  - ❑ Plasma Support Technology

- ❑ Magnetic Concepts
  - ❑ Transport
  - ❑ Burning
  - ❑ MHD Stability
  - ❑ Steady State
  - ❑ Boundary
  - ❑ Integration

- ❑ Energy Issues
  - ❑ Long-Term Visions of Fusion Power
  - ❑ Paths, Options, and Decision Criteria

- ❑ Emerging Concepts
  - ❑ Long-Term Visions
  - ❑ Physics Issues
  - ❑ Next-Steps
  - ❑ Tech. Opportunities

- ❑ Inertial Concepts
  - ❑ Targets
  - ❑ Drivers & Standoff
  - ❑ Power Plants
  - ❑ Metrics & Paths

- ❑ Plasma Science
  - ❑ Turbulence and Transport
  - ❑ (M-)Hydro & Beam Equil./Stability
  - ❑ Wave & Particles Interactions
  - ❑ Plasma Boundaries & Interfaces

Submitted by: _____

Institution: _____ **Date and Time:** _____

For Use by Fusion Study Staff Only:

CHIT No. _____

Copies submitted and/or posted to:

- ❑ Organizers
- ❑ WG Info Boards
- ❑ Magnetic Concepts
- ❑ Emerging Concepts
- ❑ Inertial Concepts
- ❑ Technology
- ❑ Plasma Science
- ❑ Energy Issues

Synthesizing, summarizing, and preparing at your final reports

The focus of the second week will be synthesis and summary. During the first week, you probably have attended just a few subtopical discussion groups. During the second week, you will want to comment on the work of other working groups.

Contributing participants of subtopical groups and working group convenors will also want to revise and to explain better the work of their own working group to others.

On Tuesday and Wednesday of the second week, the working groups should try to form a coherent framework representative of their group's activities, and they should try to respond to the comments and suggestions from individuals from other working groups.

Finally, subtopical discussion groups should take this time to assign writing tasks to contributing participants for their proceedings article.

The Closing Plenary Sessions

The purpose of these final plenary sessions is to report to the community as a whole the discussions and (hopefully) the findings of each working group.

It is very important that these reports accurately reflect the work and contributions of the working group participants. This is the reason for having both the Thursday and Friday sessions. We want to give Snowmass participants the opportunity to see, to revise, and to comment on the final summary reports before they are actually "finalized".

The closing plenary session is the stage where each working group can describe the high-leverage "key issues" and the exciting "opportunities" to advance fusion energy science.

During Thursday's "open discussions" of the Summary Reports, each working group organizer (or a designated representative) will present the working group summary report.

The working group organizer will have approximately one hour, but each speaker should prepare a formal presentation for *only half the allocated time*. The remaining time is for comments and clarifying questions from the audience of Snowmass participants.

Publishing the Proceedings

The *Proceedings* will consist of:

- Written summaries of the working groups, authored by the working group convenors,
- Written summaries of the subtopical discussion groups, authored by the contributing participants,
- Contributed reports, authored by individuals and groups. Contributed reports from individuals are limited to six pages. Contributed reports from groups are limited to 24 pages. (You may be a first author on at most one contributed report, and you must have attended the Workshop to contribute a report.)

The main audience for the *Proceedings* is the fusion community itself; however, the working group reports should be readable by the general scientific community

The *Proceedings* will be published on a CD-ROM, and it will consist of a collection of papers in PDF format indexed by a browser-compatible HTML file. The *Proceedings* will also be available on the WWW.

The deadline for submission of the proceedings articles is September 10, 1999. Authors of articles for the *Proceedings* must complete their work during August.

Closing Comments

The 1999 Fusion Summer Study will be our first two-week, open meeting to discussion options for the future direction of our research. It will also be a workshop unlike any other that we have participated as a group.

With three simultaneous independent working groups in the morning and three in the afternoon, Snowmass may at times seem overwhelming, intense, and confusing.

You should keep your sense of humor and remember our goal of working together to understand the key issues and opportunities for fusion. We should listen to our colleagues and keep our own comments candid and constructive.

We have time during Snowmass for informal discussions with your colleagues.

At two consecutive weeks, Snowmass will be our longest fusion workshop. **We need to pace ourselves!**