MCS DIVISION RETREAT 1998[1]

COMMITTEE MEMBERS.

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RETREAT GOALS:

The central goal is to generate new ideas for research topics and organizational models for MCS: directions in which we could move within the 3-6 year time frame. The tone should be *speculative rather than deliberative*. This is not a decision-making exercise, but rather *a process for exploring the space of possibilities*—generating and discussing the material on which future strategic planning will be based. It is an opportunity to get everyone together to think coherently about the directions we could and should be taking.

The retreat will also improve teamwork and cross-cutting interactions between division members. We will share knowledge about the process of generating and pursuing funding opportunities.

LOCATION/DURATION.

The retreat will be held at Lake Lawn Lodge, Delavan, Wisconsin, about two hours' drive from Argonne. The sessions will be held on May 27-28, with participants arriving on the evening of May 26. Use of laptops will be verboten except when preparing transparencies as part of group deliberations, or when actually presenting results of the deliberations to the large group.

In the following description, "Day 1" is May 27 while "Day 2" is May 28.

We will be in session from about 0900 Day 1 to 1700 Day 2, with an informal get-together on the evening before Day 1. Pre-organized activities will consume only part of the time; the remainder can be used for extensions of the organized sessions, informal small- or large-group meetings, question-and-answer sessions, other activities planned on the fly, or beer.

SESSION I: HOW THINGS WORK.

This session is about how the division is funded, now and in the future. It will begin with a presentation and discussion led by Rick on a major DOE initiative that may strongly impact the Division's future: the Strategic

[1] Revised 5/20/98.

Simulation Initiative (SSI). He will also discuss another effort within DOE that will impact us: ER's identification of 20-year Research Themes. The second part of the program will be a series of short presentations on project funding experiences.

The SSI is still very much in the evolutionary stage, but it appears that the total program size may be as much as \$500M. Rick sees the possibility of \$20-30M coming to Argonne, of which MCS could compete for about two-thirds. We will devote about 90 minutes to this topic. Rick will tell us what he knows, and anticipates a lot of interactivity.

The second part of the session will also last about 90 minutes. People with some experience at getting projects funded will share their experiences in short presentations of about 10 minutes each, including discussion and questions, using about three transparencies. The presentations should focus on questions of project genesis, funding, and growth. We will discuss how sources of possible support can be identified, how a funding possibility can be turned into a real opportunity, how the money is obtained, how the project is managed and grows. The things that happen *before* the call-for-proposals is issued are vital and should be emphasised. The aim is to get people to understand the life cycle of a project. Though not specifically a forward-looking activity, it could broaden understanding of the financial gestation of projects and hence contribute significantly to future division activities.

Not everyone with funding experience will get to talk, but we will try to cover most of the areas currently represented in the divison.

Schedule

9:00-10:00.	Rick: DOE's Strategic Simulation Initiative, ER's 20-year research themes
10:00-10:30.	Discussion
10:30-10:45.	Break
10:45-12:15.	10-minute presentations by individuals with funding experience.

SESSION II: RESEARCH AGENDAS FOR MCS.

The aim is to identify and prioritize research goals for the division. We are looking at projects on all scales, from major efforts such as Alice, FL, or DSL, to smaller ones with perhaps 2-3 investigators over a 3-year period. Discussions could include projects like Alice (for which much of the intellectual expertise already exists in MCS) as well as, say a quantum computing project (for which we would be starting cold). The outcome of this activity might be a portfolio of possible research directions, which will include large and small efforts, conservative efforts and more speculative ones. The best mix between these various aspects is a question for discussion.

After a scene-setting large-group session, the meeting will break into seven small groups of about 10 members each. Small-group discussions will last for about 2 hours. Each group will be assigned a discussion leader for purposes of this session; these leaders will be briefed and given some guidelines that, among other things, will clarify the role of SSI in the discussions.

Groups should propose projects in three broad categories:

- Projects that we could tackle independently of SSI;
- SSI-related projects;
- ANL-strategic projects—those for which ANL is a particularly appropriate venue for one reason or another.

Projects should be quantified in terms of the following factors:

- importance
- size, i.e. what levels of effort and resources are needed?
- is it something we can start now, or do we need to hire of people, find funding, etc? How much time/effort will be needed to assemble the resources?
- level of enthusiasm. How many people are excited about it? How excited are they?

The following factors should be considered in proposing research projects:

- megatrends: what is hot now, what might become hot, and what does it imply for our research agenda?
- what linkages between different research groups in the division would enable us to attack some important problem? What linkages outside the division?
- what new resources would we need to make activity X happen? What collaborations are needed, and how can they be established?
- where could we find support for activity X? Do opportunities already exist; if so, how can we plug in to them? How could new funding opportunities be created? Will we be able to attract a funding base that is stable and long-term enough to make a difference in the chosen area?

- will there be some smaller independent projects, or should smaller projects be affiliated with larger projects in some sense? How will small projects be supported?

- how should our work relate to applications? What structural role should we play in applications-focused activities at ANL?

Small-groups discussions should be summarized on butcher paper and attached to the walls of the breakout rooms. The deliberations will be summarized in some template format that involves diagrammatic representations for each proposed project of the risk-reward tradeoff, and other metrics.

After the small-group meetings, everyone will be invited to circulate around the breakout rooms to critique and discuss the conclusions of the other meetings, as expressed on the butcher-paper summaries. They will be invited to write comments on the paper if the spirit so moves them.

After this, one or two representatives of each small group (including the leader) will meet to prepare and coordinate their presentations to the large group later in the evening. Some duplication could be eliminated and some projects combined. (Combination should not happen, however, if there are different and interesting perspectives on the same project.) The material prepared in this coordination session will form part of the record of the meeting.

Finally, after the dinner, we will gather for a one-hour large-group session, at which each small-group leader will speak for 8-10 minutes, including discussion.

Schedule

1:30-3:45.	Scene-setting large-group session followed by small-group sessions.
3:45-4:00.	Break
4:00-5:00.	Individual critique outcomes of other groups.
5:00-6:00.	Group representatives meet to coordinate evening presentation
6:30-8:00.	Dinner
8:00-9:00.	Large-group session: Presentation of outcomes by group leaders.

SESSION III: THE SHAPE OF MCS TO COME.

In this session, participants will consider seven alternative models for the future of MCS. Some represent an evolution from the current division structure, others represent more radical departures that involve MCS becoming part of a larger structure. In connection with each model, participants will be asked to consider a number of issues relevant to activities, funding, operations, and culture. Rick will provide a short summary of each alternative model. Participants should think about these descriptions in advance, and are encouraged to do some research in advance on some of the issues in question (in particular, the question about "has this model been tried before?"). Questions can be asked in a scene-setting large-group session.

In addition, groups will be encouraged to come up with their own models and evaluate them according to the same set of issues.

The small groups in this activity will be the same as for Session II, but the discussion leaders will be different. The seven proposed models will be allocated between the seven small groups such that each group gets two models. After the small-group discussions, there will be an amalgamation into three medium-sized groups (consisting of two, two, and three small groups respectively). Within each medium group, any given model will have been discussed in either zero or two small groups. For instance, the distribution of models among groups, and the assignment of small groups to medium groups could be as follows:

Group	Models Discussed	Medium Group
A	1,2, other models	ABC
B	1,3, other models	ABC
C	2,3, other models	ABC
D	4,5, other models	DE
E	4,5, other models	DE
F	6,7, other models	FG
G	6,7, other models	FG

In the medium-group sessions, the results of the small-group deliberations on each model will be synthesised into a few slides, which will be used in a report to the large group after lunch. In the large-group session, there will be an 8-10 minute report on each model, with presentations given by the group leaders.

The models in question are

1. A large facility, centered around computational resources, containing both a large support staff for the facility, development groups, and a research group. This model is not unlike the old AMD.

2. A smaller unit with moderate computational facilities that is more focused on fundamental research. This model can be thought of as current MCS with tweaking; participants should suggest the tweaks.

3. Center for Creativity and Future Technology.

4. Computational Science Institute or Theory Division.

5. Virtualizing MCS. Members would be geographically distributed and would typically hold appointements at other institutions as well. A model based on the Fraunhoffer Institutes in Germany.

6. Merging with other divisions at ANL and hence becoming part of a super-division. With which divisions could we merge?

7. Becoming an anchor tenant in a technology park: "MCS Software Inc."

Issues to be considered include

1. Funding: How much is needed, how and where it could be raised, who should write the proposals and do the fundraising?

2. Governance: Who is in charge, who has fiduciary responsibility, is there a need for advisory boards and if so how should they be composed?

3. Institutional Context: Who is the employer/administrator, what services do we need from them, how would benefits and pension plans be handled?

4. Scientific Pros and Cons: What kinds of projects are suited/unsuited to the model in question? Would this model tend to support big projects or small projects? Would they be more industrial or academic in orientation?

5. How would the model handle

   - hiring new permanent people, team people, temporary people, programmers (!) Should we consider joint appointments at universities?
   - students: hiring and supervision
   - starting and management of new projects

6. Who would be part of the enthusiastic core group to kick off the model (besides Rick :))

7. Cultural Pros and Cons: What kind of culture would the model breed? How does this factor interact with the scientific agenda, and will it be attractive to the kind of people we need.

8. Has anything like this model been tried before? Has it worked?
9. Under this model, how would/should MCS participate in the computational science strategy for ANL?
10. How does the model impact our relationship with University of Chicago and other universities? Should it serve to complement existing departments in a mutually beneficial way? Should stronger relationships with these universities be a part of the model?
11. Should relationships with the Mathematics and Computer Science groups at other DOE labs form a part of the model? What would be the right mix of cooperation (on specific initiatives, both small- and large-scale, to DOE-MICS and elsewhere) and competition? What do past efforts at cooperation teach us?
12. What library resources are required under this model (both paper and electronic)? Consider other infrastructure needs: e.g. the special communications, computational, and support infrastructure associated with this particular model.
13. Mechanisms for communication between division members. Under the model in question, how do we arrange things so that division members know as much as they want/need to know about what is happening? (Sample idea: Enforce one day/month as a non-travel day.)

Schedule

9:00-9:20.	Scene-setting large-group session.
9:20-10:40.	Small-group sessions.
10:40-11:00.	Break.
11:00-12:00.	Medium-group sessions.
12:00-1:30.	Lunch.
1:30-2:45.	Large-group session.

SESSION IV: OTHER STUFF.

About two hours remain after the end of Session III. This time will be organized on-the-fly. Suggestions for organizing this time are welcome. It could simply be used for large-group discussion of issues that arose during earlier deliberations.

In any case, participants are urged to stay until 5:00.