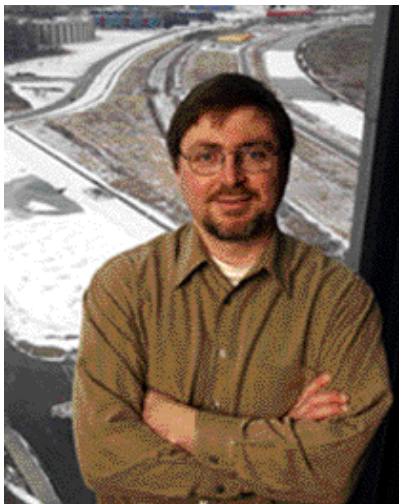


Letter from ICAR's Program Director



Christopher White, Ph.D., ICAR Program Director

The founding vision of the Illinois Consortium for Accelerator Research is very simple: to direct the strengths and resources of our local research universities into the field of accelerator science and thus increase the vitality of Fermi National Accelerator Laboratory. ICAR recognizes the economic and intellectual importance of our national labs and has embarked on a mission to help secure and enhance the future of these facilities in Illinois. Our history may be brief in years, but we believe that our impact has been great. Recently, our Advisory Board, directed by Mike Witherell, called together a prestigious panel of experts to assess our progress based on our stated mission and goals.

The panel consisted of four research physicists from Fermi National Accelerator Lab, one from

Argonne National Lab and one from Michigan State University—local experts in the fields of accelerator and high-energy physics. They received input on ICAR's founding, mission and goals and heard from researchers representing each of the ICAR institutions. I am proud to say that the panel, in general, praised our efforts. Of particular note is their praise for ICAR's ability to initiate significant accelerator activities at all participating institutions where little to none had existed previously.

Their recommendations, which are included in this edition of the newsletter, are key to our progress in the future, and we will be implementing them in the upcoming months. The recommendations outline changes that will be made so that ICAR can evolve from a fledgling organization into a powerful and influential player in regional accelerator activities and projects. We will be working closely with both Fermi and Argonne labs to further their interests while promoting accelerator projects in Illinois and establishing permanent accelerator research programs at area universities.

We are proud of what has been accomplished; yet we have a lot of work to do. The coming year will be pivotal in determining our future as we coalesce into a well-coordinated research organization. I look forward to the exciting opportunities laid out before us and the impact we will have on accelerator efforts in Illinois.

ICAR is a collaboration of five Illinois universities:

Illinois Institute of Technology

Northern Illinois University

Northwestern University

University of Chicago

University of Illinois,
 Urbana-Champaign

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Fermilab.

Illinois.

The Future.

The Face of ICAR

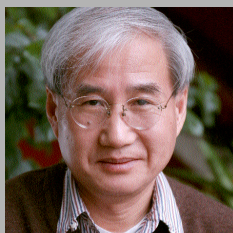


Dan Kaplan

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Panel of Experts Assesses ICAR's Progress

Charge to the Review Committee

On Wednesday, September 10th, 2003, a distinguished Review Committee (see next page for committee members) met at Illinois Institute of Technology (IIT) to evaluate the progress of the Illinois Consortium for Accelerator Research and determine if the organization had been working to fulfill its mission of advancing accelerator research and development within Illinois. ICAR's Advisory Board, led by Fermilab Director, Michael Witherell, called upon the principal investigators from the five universities that constitute the Consortium (IIT, Northern Illinois University, Northwestern University, University of Chicago and University of Illinois, Urbana-Champaign) to present their research results and future plans to the panel consisting of six external reviewers.

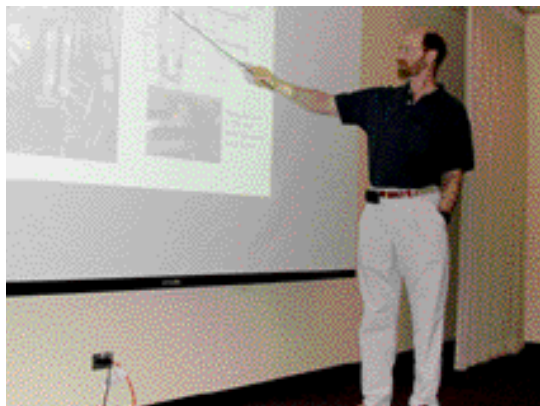
The Review Committee was charged with making recommendations concerning the focus of ICAR's research agenda given the organization's mission, with consideration being given to the current needs of Fermilab and Argonne, as well as to the need to strategically position ICAR to maximize future funding opportunities from both state and federal sources.

Excerpts from the Review Committee's Findings and Comments

ICAR should be congratulated on its progress over the last few years. When it was started, there was very little activity in support of Accelerator Science at the Illinois universities. Although the ICAR Charter specifies that its primary goal is to bring support to Fermilab for future projects, it is impossible to accomplish this goal unless there is a strong base at the universities in Accelerator Physics. It is impressive that at the review all five participating institutions could show substantial activity in this area. The various projects undertaken by the ICAR universities are intellectually stimulating and are attractive to graduate students and post docs, which is necessary for the future success and strength of the program. The base has been laid for training students and for involving faculty at the Illinois universities in the development of new technology for acceleration of particles. It should be noted that the future of

Fermilab is intimately tied to the design and construction of cutting edge accelerators. Reducing the cost and complexities of these machines has become a major challenge. The ICAR Universities will be a major resource for the future development of Fermilab if the programs described at this Review continue to grow.

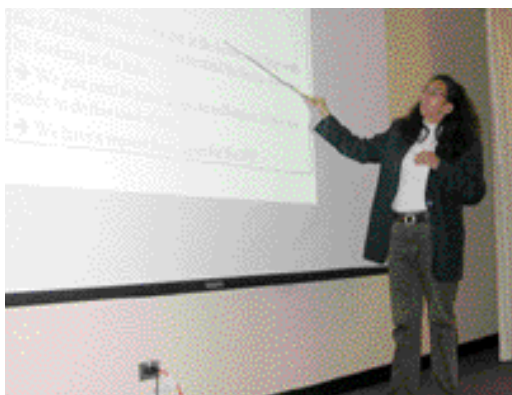
A couple of accomplishments of ICAR stand out in enhancing the probability of future high energy accelerator facilities being sited in or near Fermilab. Through the ICAR-funded work by the Illinois universities, accelerator R&D on advanced muon beams, which could lead eventually to a neutrino factory and in the longer run to a muon collider, is alive and well in the Fermilab area. Such a system therefore



Daniel Kaplan, Ph.D., Principal Investigator, presents an overview of IIT's ICAR-funded research.

remains a viable option for the future of High Energy Physics, and the important contributions by ICAR help make Fermilab a leading contender for such a facility, should it be built. ICAR has played a crucial role in keeping the Fermilab-NICADD Photoinjector Laboratory (FNPL) not only alive, but also intellectually thriving. This facility is important for the Linear Collider and for studying advanced acceleration techniques, which lay the groundwork for the (very) long-term future of High Energy Physics and Fermilab. ICAR universities have been able to engage in public outreach and education about high energy physics and the benefits of Fermilab to Illinois.

Additional benefits have come to Illinois as a result of its investment in ICAR. These include a number of federally funded grants for accelerator R&D that



Mayda Velasco, Ph.D., presents the work of Northwestern's ICAR-funded groups to the panel.

have been leveraged from the ICAR work and technological spin-offs developed in cooperation with local companies. These, too, should be considered part of ICAR's success.

Although the main goal of the State in funding this program is to assure the future of Fermilab, we would like to emphasize that the development of a strong program in the universities in Accelerator Science, by itself, is an important element in achieving this goal. This is a unique development in the US and even in the world and helps Illinois position itself well as a site for a future large machine. The participants have done an excellent job in using the resources made available by the state to create this inter university-lab based R&D program.

ICAR Scientific and Technical Program

The largest effort by the ICAR universities has focused on muon-based systems and its work has ensured that

a neutrino factory (or muon collider) remains a viable option. This work has been well coordinated with the larger muon collaboration effort... Additional work has been done on detectors, advanced acceleration methods and FELs, and this is nice to see as it provides a healthy diversity to the program and provides additional opportunities for training the next generation of accelerator physicists.

ICAR gets very high marks for pushing accelerator R&D programs on several fronts from ground zero to a level that they can sustain the R&D on their own. In the muon cooling effort they have done an excellent job. The committee is very impressed by the level and quality of work...

ICAR was established at a time when it was not clear what next large accelerator project would be supported by the HEP community. In the last two years the broad picture has changed considerably. HEPAP, ICFA and many other world organizations have publicly endorsed the Linear Collider as the number one next accelerator project. The increased work by ICAR Universities on linear collider R&D is in line with this direction...

Ensuring the Stability of University-Based Accelerator R&D

In several cases the ICAR principal investigators have generated additional proposals that, if funded, would help stabilize the newly created accelerator R&D groups at their institutes. This is to be applauded, and

(Continued on back page)

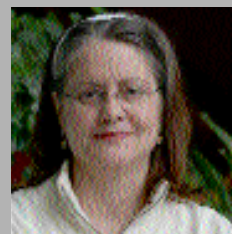
The Face of ICAR



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PANEL MEMBERS

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Stephen Geer, *Fermilab*
Stephen Milton, *Argonne*

Shekhar Mishra, *Fermilab*
Alvin Tollestrup, *Fermilab*
Hendrik Weerts, *Michigan State University*

REVIEW COMMITTEE AGENDA AND SPEAKERS

9:00 am	Executive session for Review Committee	11:45 am	IIT – D. Kaplan
9:30 am	ICAR, organization and history – C. White	12:30 pm	LUNCH
9:45 am	Overview of physics program – D. Kaplan	13:30 pm	University of Illinois – D. Errede, K. Makino, I. Rakhno, K. Paul, M. Haney
10:00 am	Northern Illinois University – J. Blazey, M. Cummings, C. Bohn	14:15 pm	Northwestern University – M. Velasco
10:45 am	Coffee Break	15:00 pm	ICAR Vision – C. White
11:00 am	University of Chicago – M. Oreglia	15:10 pm	Coffee Break
		15:10 pm	Review committee deliberations
		17:00 pm	Closeout

we strongly encourage the universities to continue to develop funding sources to ensure that their accelerator R&D programs continue beyond the end of ICAR funding...

Response to Specific Questions

...Is the current research program meeting ICAR's mission?

This is simple to answer, as it is a resounding yes. One must only look at the way in which the universities are supporting accelerator-based physics and technology programs. Just a few short years ago there was not a single such program at any Illinois university...

Has ICAR used its resources efficiently? Largest impact?

And this is a difficult question to answer, but the answer is still probably yes and again for the same reason as just stated above. There are now five Illinois universities pursuing topics in accelerator-based physics and technologies...

Recommendations

The committee was impressed by the progress made by the ICAR Universities in the last couple of years...

(Recommendation #1 asked that mechanisms be developed to: determine what programs should continue to be supported and at what financial levels; report to the Program Director on technical and financial matters; enhance cooperation among the institutions; put in place an annual technical review and meet annually with the Advisory Board.)

2) In choosing future directions, ICAR needs to take account of the long-range plans of both Fermilab and Argonne and to develop mechanisms to ensure that the work is adequately coordinated with these laboratories.

3) The work on muons has proven to be a fruitful avenue of pursuit as witnessed by Fermilab's construction of the MuCool facility, and it should continue in a vigorous way.

4) The work on the linear collider by ICAR should be better coordinated among the ICAR universities and with Fermilab and in particular should be focused on issues aligned with bringing such a large project to Illinois, especially now that it has been designated as the top priority project by the HEPAP.

5) Another, more in-depth technical and programmatic review should be conducted in conjunction with the preparation of the proposal for the next 5-year program.

6) The Program Director should report to the Advisory Board by the end of this year on the steps taken by ICAR to implement these recommendations.

ICAR staff and members are grateful to the Review Committee for their careful, in-depth analysis of ICAR's efforts and will be meeting in January to implement the recommendations.

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ICAR, a non-for-profit organization, is a consortium of five Illinois institutions of higher learning: Illinois Institute of Technology, Northern Illinois University, Northwestern University, University of Chicago and University of Illinois at Urbana-Champaign. The organization was formed in 1999 and funded by a grant from the Higher Education Cooperative Act under the aegis of the Illinois Board of Higher Education. Its purpose is to help ensure that Fermilab continues to be a vital force in the forefront of international high-energy

physics and an engine for scientific, economic and educational progress in Illinois. ICAR's five member universities conduct research related to possible future particle accelerator projects; train a new generation of accelerator scientists, much in demand but low in supply; promote understanding of the scientific and economic significance of Fermilab to Illinois by educating decision-makers and the general public; and work with schools and teachers to advance knowledge of accelerator-based research.

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