

**Advisory Committee Meeting for International Science and Engineering  
February 9-10, 2006  
National Science Foundation, Room 1295**

**MEETING SUMMARY**

**Members Present:**

**Fred Roberts, Chair,**

**Jeanne Altmann,**

**Jorge de Paula,**

**Patricia Galloway,**

**Terry Jordan,**

**Melanie Loots,**

**Tilahun Yilma**

**Members Absent:**

**OISE and NSF Senior Staff Present**

**Kathryn Sullivan,**

**Larry Weber,**

**Eduardo Feller,**

February 9, 2005

***Welcome and Introductions of New Members and Staff***

KS Welcome members, guests. We have a full agenda. Some discussion of OISE and programmatic activities, a lot of the discussion will focus on broader international issues. Pat Galloway has agreed to join our committee. Also on ENG AC. Second new member is German Nunez, also member of CS committee on equal opportunities in S&E.

GN Originally from Venezuela. Came to the US for engineering training. Had academic career until 95 when he became administrator at UC Boulder. Now VP of Texas Tech.

PG Civil engineer from Purdue. Has MBA. Doctorate from Japanese university. Most of work overseas, management consulting, dispute resolution. Been to 88 countries. Asia-Pacific. Extreme vacationer. Wants young people interested in engineering. Especially girls.

KS Go around table, introduce yourselves...

FR Welcome on behalf of committee.

***Administrative Matters***

FR Melanie Loots had her flight cancelled last night. Had agenda change because we had a telecom with ADs and chairs of committees. Melanie will summarize if she's here, or KS will provide a summary. Busy agenda today. Let's spend a lot of time discussing and let's be flexible.

EF Make sure you sign sheet. Green envelope in folder for lunch money. Level of formality now that we're a full committee instead of a subcommittee. That is why you see three notetakers for minutes. Replaces old method of collecting messages into a letter.

KS COI forms must be signed for this meeting

EF Yes, I will need updated COI form from everyone.

FR John was telling people we don't have to update it if we already have one.

EF COI form is associated with your committee, unless change, no need to update.

FR Do we approve of the agenda?

Silence I'll take as approval. We have to approve last meetings minutes. Any other comments about minutes from previous meeting? Motion to approve?

Vote: Aye, no nays. Minutes are approved.

On behalf of committee, thanks for wonderful job you've done over your year now of leading this activity.

KS The timing of this meeting has been both fortunate and not. Just this week we did budget rollout. Unfortunate, this overlaps with board meeting offsite so Drs. Bement and Olsen won't be here. They send their regrets and regards.

### ***OISE Update-Budget and Programs***

KS presentation 1

FR Great report, faster than time we gave you.

KS Any questions?

JA Do you feel personnel moves will address issues we discussed last time?

KS Certainly some of them. I'm pleased Bement supported IPA recruitments. OISE hasn't had an IPA slot in a while. The IPA recruitment generated interest in NSF colleagues who said, I don't qualify for IPA, but would you consider details? That's great.

TJ When FY 07 requests such amount, is that request from the president?

KS Yes. We're at the beginning of the budget process. This is a good start. Our budget doesn't exist for 07 until it's passed and signed. We're happy with the number.

FR This committee can help you think longterm. What would be the biggest priorities for 08 in terms of budget?

KS After this week, we'll start brainstorming that. Could we do more broadening participation? What should we be doing, are there specific areas of research we'd like to focus on, specific types of activities, forms of collaboration? We've shifted small collaboration efforts back to the directorates. Our job is to look at catalytic issues and topics. Obviously there are, what are global phenomena we should be looking at. Things that are not specific to a particular region. IS that something we should be doing? How do you define that? We've had some discussions, but over the next month or so, we'll discuss that more.

GN Broadening participation, what are the specific target groups?

KS We define three groups, individuals, institutions, specifically below the university level. We're very broad regionally and research wise. Our recruitment does not have a specific area of research expertise. In terms of broadening participation, I see our opportunity to be taking advantage of int'l character of an activity that might be attractive to individuals...K-12 teachers and students...very broad, flexible. ...

GN It departs from traditional definition of broadening participation.

KS No, it would be consistent with that. The definition that NSF has used has also been for individuals, in addition to institutions

TY Engineers listening to NPR, people discussing...budget increases

KS Doubling of the budget is a part of the presidents ... initiative. Congress requested a study on engineering with the focus on what do we need to do in the nearterm to address the issue of s and e competitiveness. It was done quickly, concrete recommendations. Expensive recommendations. Lots of funding recommendations. Congress did a smart thing, held several small group sessions, talked about these issues. It generated lots of interest, a positive response. As a result, the president's initiative tried to pull in some of the things from that report. Maybe go a little further.

FR Thanks.

### ***Update on Partnerships for International Research and Education***

Ed and Libby

Ed PIRE – Results of Pilot Program slideshow

Libby's section of the slideshow

Questions?

TJ Were there any general characteristics of the awards that were chosen vs. lower tier props?

EL These are focused research projects that can't be done without strong efforts from overseas collaborators. A number of the projects have multiple US institutions. Went out and got an int'l collaborator, then got the best US person from another US institution to participate.

KS There were several props that came in that were very strong, we thought we would fund ten. Support across NSF allowed us to fund 12. Was the research or the education part of the title more important? Both. Some had good research activities, some had good models, but if they didn't have both, they weren't funded. Some of these were picked up by other directorates at NSF. The challenge for this is it has to demonstrate there's a partnership that the foreign collaborator is bringing something unique to the table that wouldn't come from a US partner.

JA It will be very important to do evaluation that you're proposing.

EL In a parallel way, we want to help them so they don't have to go on their own and do these things. We're open to all possibilities. ... What we don't want to do is add additional burdens. The challenge is new projects have more bells and whistles but the scientists need the time to focus on the science.

FR It's been my impression foundation wide, there are never enough resources to do followup, site visits. Are there adequate resources for this here?

EL We're early in the process. We had the foresight to include funds in the grant for the PI to come to DC every year. This is a very important program and the office will find the resources to do it right. Many NSF programs don't think about this until farther along than we are.

KS Resources, personnel side, program specialist position was developed with the partnership in mind. Mike will transcend both PIRE I and II. While their burden has increased, with additional staff, we will actually be able to distribute work so the burden will be lessened. That's a start. Site visits, those will require s and e fund resources. As the offices portfolio grows, the work to support the portfolio will grow.

EL Site visits, as program officers go out, we can provide feedback...

JP Low number of minorities in PIs. How about the students? Is there a plan to make an impact there?

EL It is on the agenda, we want to enable folks to do well. I don't know in depth for the 12 awards. Many had strengths in plans for recruitment.

JP Only noticed one minority service institution in the list

EL I agree, we're trying to raise/address these issues. How do we make sure minority serving institutions are served? We're aware of that.

KS Going forward, that's in the back of our mind. The requirement for the first one was PHD granting institution. As a process, this is one of the challenges for this activity. How do we reach beyond PHD institutions? How do we promote linking up with other institutions so one can bring representatives from other institutions?

JP I have ideas on that

EL NSF has a whole suite of programs. One of these things we need to do is strengthen the links to these kinds of programs.

GN what are the mechanisms to deal with the licensing of exporting technology enforced by DOC, DOTreasury?

KS The basic answer is, our awards are made to universities, they are responsible for operating under US law. Export controls, many universities have experts on campus that have the knowledge of what these laws require. There's been discussion over the past six months regarding deemed exports. The US research community has weighed in on the federal register. Whatever US law is is what they'll be required to do. The basic tenet of NSF is we transfer funds to the university and we expect them to follow laws. We can point them to good contacts within gov't.

GN Nothing coming out of your office that states what has to be done?

KS Nothing calls it out specifically

TY Big issue in the biology field. Since 9/11 we've been going in circles after developing recombitants asked for by gov't. We're all afraid to send vaccines out of the country.

KS Part of it is making sure the best balance is struck between national security and other national needs...

JA In the past, one of the things that has limited us, is the lack of a database on individuals. Who has been trained, who's in the world training people. There's no time or money going back because the tracking wasn't done. This program seems like the ideal place going forward to track who is the experts in this stuff and who is working on what.

EL These are things we haven't gotten to yet, we haven't made decisions yet, but we're going to think long and hard about it.

EF Issue GN raised, the practice of this office is to instutct the grantee on property rights so there are no recriminations down the road. We warn them to sort this out upfront.

RG Deemed exports, NSF is keeping track of these things in the Office of General Counsel.

FR That obviously concerns all of us.

GN My experience is that many of the scientists are not familiar with it. Sometimes the offices of research at universities are not familiar with it. Props go out, are awarded, and you find out about it later. People are paying more attention. There needs to be a little more awareness in the scientific community of the constraints.

KS There's a need for awareness on the US Gov't side as well. How these things affect the scientific community.

JA As one moves into collaborations with other universities, it's easy to say collaborate with non-PHD institutions, but they don't have the same resources, the experience of working with NSF or deemed export issues.

EL We can provide more awareness and communication. Someplace ot have information available. We have best practices for ... We're in an age where there are many other issues, we can say it's the institutions responsibility but that's not managing your risk very well. We're supposed to minimize risk.

## ***BREAK***

### ***International Collaboration-Models and Principles***

KS Presentation 2

FR What do you expect will come out of this discussion?

KS What I anticipate is we will have a document our office would write. This is an important first step. We'll gather information to report to Bement. The format for that hasn't been defined. What we're seeing is over time the ways different parts of the foundation engage with foreign funding agencies have led to different models. Do those models work? Why? Best practices are what we're shooting for. There is not a deadline on this.

FR What should this committee do in the shortrun, longrun? What would be the goals?

KS For this meeting, start the discussion to stimulate thought. AS we move forward, I anticipate we would keep you apprised and look for further thoughts and comments. That's how I envision this. This is a starting dialogue that could take a while. This is not a shortterm activity.

PG Which org.s overseas that NSF has collaborated with in the past?

KS There's been a lot.

LW NSF supports US foreign collaboration across entire spectrum. That's referring to grantees. What wer're talkinga bout here is the support and management of collaborations that NSF is supporting in the community. Generally, the counterpart funding agencies in other countries. The question wer're trying to address is, given NSF and counterparts are supporting our communities, for a particular collaboration, which models, at which point in the spectrum, can we best support the kind of collaboration we want.

TY To select a management model without the other participants will be difficult. They may want a say in how programs should be managed. If the counterpart is in a developing country, they would probably accept any management to participate in the program. There may be general concepts, but it will be significantly effected by who the partner is.

LW NSF is approached by counterparts, they want to be on the righthand of the spectrum with us. They want to have a targeted budget set aside, jointly financed, jointly managed program. The question Bement has asked is, give me a set of principles, so when I get a request from country x to collaborate, I can say, let's consider this and see what the best approach for NSF will be to manage a program in this discipline with this country and why.

GN I agree the absence of a unique model that fits all, we could talk about variables that could be integrated into a model. Circumstances determine the variables. Many countries money fluctuates, currency devalues over a year. What we agree to today may not be feasible in a few months. Identify variables that significantly affect change.

KS The model types was an exercise for me, strictly the elements of a research funding process. These variables sound... If we got to that articulation, what Bement was looking for would be done.

PG Some of the things I would look at in collaboration, it seems to me one of the things NSF would put into this model is how far does this come up on NSF's internal priorities. How does it best fit into NSF's own priorities. Second, are there common country goals. Are there common world issues where a combination of countries can solve better than a collaboration with just one country. For example, global warming. Third, the shared benefits to another country. What would the research do to better each country involved. Is there another collaboration that has a better impact on the nation. Fourth, where does it help s and e education. That has to be one of the considerations.

JA Do we have some history on which ones have been carried through, worked out, failed? Students from country where the money was highly devalued have a fellowship...

KS The office has some history. There's an interest for a dedicated funding to be guaranteed over a period of time. We've had in the past specific programs with specific countries. I came to OISE when we shut these programs down to create greater budget flexibility, to use the money to fund the best science, remove limitations. The work that was funded under those activities weren't failed research, but from a budgetary perspective, it's not a practical approach for NSF to take. When these programs were in place, we got the question "why them, not us"?

JA Those were ones established under this lower right model

LW Probably the one there, the hybrid

JA Sounds like there's a balance between longstanding highly integrated programs, there are fewer surprises, but the flexibility and the issue of fairness are lost. The marginal cost of an established program can be somewhat lower than establishing new models all the time.



LW We have the historical variety of models within the int'l office, but those grants were providing small supplements that did not fund the core research, but only provided funds for travel and expenses related to int'l. What we're talking about here, is how do the programs across NSF interact with counterpart agencies. There's the IODP, tens of millions each year managed under formal agreement between Japan and US, there are subagreements from many countries. Monies go into a pot. Each country has representation on management committees. It's truly a joint program with NSF playing a leadership role. We don't have that model for other activities.

TY This kind of collaboration, it's simple in medicine. Example...exotic diseases... difficult to study here since it's over there... we have partners in Kenya and Senegal with facilities to test the vaccine we develop here

LW Is NIH and Homeland security working directly with foreign counterparts to fund, support and manage those facilities

TY They have a facility where the vaccine can be evaluated. They provide space, personnel. US fund the research, give opportunity to people to come to country for training. All countries benefit mutually. Both bring unique resources to solve the problem. That probably would be one model.

JSPS guy ????...??? strategy to contract international collaboration ... ????

KS As I was thinking, equipment was one of the principle criteria that may be very much an essential item for very strong hybrid collaboration. It has to be done as a result of int'l partners. That's the only one that's been clear in my mind. ...

We have some time tomorrow to discuss this further if anything comes to you tonight.

FR Welcome Melanie, just in time for lunch

***Working Lunch: Broadening Participation of the U.S. STEM Workforce through International Activities***

Thomas Windham (used overhead slides-had a handout but I didn't get one)

Stats showing how minorities are underrepresented in academics: fewer receive degrees, etc.

Description of programs used to broaden participation. Other funding opportunities. Collaborative programs, the AGEP program. Encourage students to go from the PhD to the professoriate so the next generation of students will have role models.

FR Underrepresented minorities are relevant throughout NSF. This body's focus should be on the international questions related to minorities.

Mystery guy I'm actually from Human resource development. Broadening participation, why are we interested in it? On the hill, I hear it's the law. Really it's fundamentally defining talent. It's critical we increase talent. We have pools totally unrepresented. Inherently they have skills. Russia has an outflow of their talent. How do you retain talent? What we want to do is act as leaders and show that other countries can utilize this talent instead of keeping them down. Find the gems within the underrepresented groups.

TJ Is there a way to leverage int'l activities? In South America, we need people with language skills. I wonder if there's a way to particularly promote the benefits to science as well as that population group by some focus on a region.

KS The IPY activities, you have middle and high school students with high Hispanic populations, students look at aspects of polar research, they find they really like the science. Next time science subject comes around, maybe they pay more attention or participate.

TW Before NSF, I was PI of a program in Colorado. The program was dedicated to increasing underrepresented groups to participate in atmospheric science. Students come do 10 week internships. They can come for up to four summers. We were able to identify funds for these students to participate in int'l summer research activities. This demonstrates how existing programs can be leveraged to participate in int'l opportunities. The opportunities are extraordinary, it's just a matter of setting priorities and assessing resources, establishing relationships.

JA We're the role models. It's been great for students who are in the minority here to go overseas to interact where they aren't the minority. It has a double benefit. I have this thing in my lab in Princeton it's hard to show NSF that I have a white male.

GN Underrepresented minorities, the source of the problem does not reside at the gate of higher education. It's mainly at K-12. There are very unique problems for different ethnic

groups. Hispanics can have language complications, lack of role model parents, combine that with socio-economics, when a highschool senior, a good student applies to a university, if he/she represents a large portion of the household income, the parents will make a stronger case for them not to go to school. I would suggest in the inclusion of a K-12 something something.

KS The broadening participation component, I'm not a scientist by training. ... The teachers lower down the pipeline are more important. We had a meeting to share information on what we're doing with followup activities, K-12 is an area of particular interest. We're still looking for specific ideas. We can add on to existing programs, put out our own announcement, a joint announcement with another directorate. BIO has a specific program. Should we have one or should we work together?

GN Be able to insert it as a part of every proposal, what are you going to do as far as outreach into the broader community? In the K-12 system, there are schools that are primarily underrepresented minorities. JA mentioned large population of foreign born scientists in universities, how that can be leveraged to reach out to a particular region. Encouraging their participation as a resource should be considered.

PG When I was in Japan, there was a large article in the Times relative to PhDs and where int'l students were going to get them. There was a slam against the US that it's no longer the place for the best and brightest. China is making a huge push, as is Germany. Those two countries have increased their PhD graduates. How are we going to continue to attract the best and brightest? The programs encourage graduates to stay and work with their original country. It eliminates the brain drain.

TW Good luck with your work. Thanks for your time.

***Readout of AC Chairs Telecon with Dr. Bement***

Read from notes on computer. Said she'll provide them to everyone.

FR I had the impression, virtually no attention was paid to int'l.

ML He didn't bring it up. I didn't ask.

KS ...

***Briefing on International Polar Year (2007-2008)-Arctic and Antarctic International Science Cooperation***

Karl Erb's presentation

2. Antarctica is governed by a treaty. 29 countries have active research programs. Sometimes just staying alive requires cooperation between gov'ts. Int'l collaboration is a hallmark of how we interact in polar regions. NSF coordinates activities in US for IPY.
3. IPY is two years, it's new math, 2007-09 due to weather. Typically we can get out there for a few months a year. Many opportunities to create partnerships that could develop for years to come.
4. The left side is the logo ICSU developed. The right side is...National Academies.
5. Life magazine from 1960. There was a time when the mass media was excited about research and we think we can get there again.
6. Example of partnership we have with the education directorate. Funded programs where high school and grade school teachers went out, connected to the classrooms over the internet.

For an activity to be IPY, it must be international.

PG ???

KE My AC has given me guidance on thrust areas in s and e. How can NSF be most effective futhering international aspects of IPY.

PG Involve people of all ages, etc. How does someone with interest in polar exploration become involved?

KE One of the ideas I have came up in the EHR AC. A gen-x member of that committee said if you want to engage people my age is putting open source software on the web that we can play with, a climate model where I can change a parameter and see what the consequences are down the road. I've been talking to her since then and she said there's an open source GIS system where you can superimpose on maps population densities, weather, and say what would happen if I made measurements in Russia. That's an intriguing idea. Maybe a partnership with a big company who can do something like that. We've been providing film from our programs to the Japanese and them to us.

KS We were planning on issuing a dear colleague letter on how it relates to our programs. We will encourage people submitting to these programs to submit proposals related to IPY.

KE We're beginning to recognize ongoing activities that could relate to IPY. There are probably a bunch of things we could do.

FR One of the purposes of this committee has been bringing in heads of offices to explore interactions with OISE. Can you mention some of the joint activities you've had before?

KE INOCH, we've been building a relationship with them in Chile. That connection gives us access to Antarctica through a different logistical route. Chile has four Antarctic programs. The current INOCH president is a former university president.

KS Karl had mentioned the China example where we have good ties with counterpart funding agencies. What we've been doing is trying to reach out to our counterparts overseas and giving the heads up that we're doing this and looking for interest. If we get nibbles and bites on this, we give them to Karl. Another component, the outreach of IPY. Working through various media to expose Americans to this at all different levels. IMAX, local-based programs, just present a wealth of information, imagery. Our office is committed to working with Karl to generate the excitement needed to expand the talent pool. If there are things you think we should be doing with partners or types of activities, we would welcome that.

JP Is there any talk of partnering with National Geographic Society?

KE We had a film crew in Antarctica this year. It started before IPY.

JP My eleven year old gets the National Geographic Kids magazine, wonderful visual magazine. Kids now use their laptops, iPods. Maybe a podcast. Different distribution methods should be considered.

PG Role models as well, the space program has been stimulated by showing young people involved with the program. It's critical to show the people involved represent a broad spectrum.

KE This year OLPA took a journalist... You're absolutely right...

GN The participation of minorities in polar activities has been minimal, particularly Hispanics. Other than Argentina and Chile, the prospect of polar is outlandish. We should outreach to that community to increase their knowledge and create an entry they could consider in the future.

KS You mentioned the EHR AC member. She specifically commented how young people are much more comfortable participating, the internet has allowed them to contribute.

KE If this has triggered your imagination and you think of an idea, let us know. We're at the formative stages. What we do with the 60 million is pretty wide open.

ML Are there ways that organizations can participate?

KE One of the important weapons we have is to involve ourselves with private organizations. I need to have discussions with the NSF general council to see how we can do that.

EF An historical note, NSF was involved in the first IGY, it led to the creation of an international office, a predecessor to this office.

KE The science attaché at the US embassy in Santiago sent me a message, they have a new American Corners program where American culture is displayed. She's invited me to send material about US polar science. We ought to think about how we can use that, maybe in conjunction with faculty and students who speak Spanish.

LW We should think about the reciprocal of that as well. There's an opportunity through the embassy fellows program to send NSF to key locations.

KE We hosted a young Chilean biologist. She went back and has been instrumental in introducing a peer review system. We haven't gotten anybody back down there.

PG A corny idea, there are trips that go to the poles. In IPY, you could have a speaker or something... "support a young scientist".

FR Thanks.

### ***Presentation on the Development of the NSF Strategic Plan***

Craig Robinson's slideshow

CR Questions?

I welcome you to look at the current strategic plan. Are there any areas we missed? I welcome any feedback and the opportunity to talk to you again when we have a draft of the next plan.

KS In terms of the timeline, we might have to do this in a virtual mode.

FR We don't have a meeting scheduled yet.

KS Normally they're twice a year. The report has to go to the White House in August?

CR The last opportunity to give us feedback would be August.

JP As a dean it's hard to make a case to write research proposals when you have to write at least five to get one funded. Is there a place in the strategic plan to address primarily undergraduate institutions?

CR ... It is critical to increase the success rate for proposals outside the top 100. There's a budget issue. By having this goal as a start, it's leading us to ask how we'll implement that. ... Yes it is a focus. You'll see a very high level strategic plan coming out of this.

FR There's an educational role where deans have to be informed. I don't think a lot of them understand how low the success rates are. Deans don't seem to understand it and that causes problems. Bad enough when young people can't get grants, but if their deans don't understand why they can't...

TY Maybe you can fund supplemental grants to major PI where they can have a small collaborative project with someone at one of these small colleges.

## ***BREAK***

### ***International Activities of the National Science Board/Committee Discussion***

Rose Gombay's presentation

GN NSF would like to interact more with DOS, DOC, etc. What is the degree of interaction with international org.s like the UN, etc.?

RG UNESCO, the US reentered recently. We formed a commission that Bement is a member of. We're just beginning to interact to see what we can do for UNESCO. UNESCO is planning on doing a review of its science programs in the next couple of years. We expect NSF should have some input into that.

KS Rose heads the GI group, responsible for interacting with these groups. There's a fair amount of activity, not just in our office, there are directorates that interact as well.

GN You had mentioned that NSF is interested in a model that would allow them to quantify grants. Have you looked at how these organizations do that type of activity?

KS We exchange info on a regular basis. Another role we play is we support visitors from all over the world to better understand how we do the grant making process so they can go back and use that at their home institutions. We want the ability to work together so our processes are compatible with each other's. This is an activity that we are very proud of and tends to be viewed as a gold standard for others. We look to learn from others too.

FR What is the role of this committee on this?

KS This was an information item for the committee.

LW we do expect the NSB task force will engage with this AC. I hope for that. In May they'll have a hearing of gov't officials, inviting public input.

RG This AC can say is you're a part of raising the profile of int'l inside the foundation.

BT We have a clear invitation to provide input on the strategic plan.

LW I've been attending the weekly meetings for the strategic planning process. Numerous people have referred to the changing environment and how s and e are now global. We haven't been able to articulate what that means as far as NSF's strategic plan. Is our goal to lead or is it to enable discovery? If we do our job right, we'll be leaders. We haven't been able to articulate that.

TY Do you ever discuss points like virtually all computer industry has a center in Bangor?

EL We had a study on outsourcing...

JA Is the distinction made between the science being global and science having a global reach? There are many ways to interpret this phrase that have different implications.

LW I don't think any of those aspects are adequately captured....

JP When we speak of science becoming global, there's a piece of it that nags me. Language and cultural training. You go outside of the conference hall, if we aren't training our students to be adept at multiple languages, and cultural training, just doing the science training won't be enough. How is all of this being addressed at NSF?

KS To be a leader and operate effectively, it means one can communicate with an international team. Not just speaking the language, but understand a number of factors that underpin successful communication. Language is a window into the culture. If you can speak a different language, you have a greater understanding, you have that insight experience to bring to the dialogue when it takes place.

EL What does it mean to be globally engaged? We met and came up with a white paper. There's not one definition. Who are our partners? What are other countries doing? We got a proposal and we'll have a workshop this year on this subject. How do we build a mechanism at NSF that responds to these changes quickly? (PI Betty Kirk)

BT If we integrate int'l component, it would be prudent to implement ...

KS Last fall, we held four orientations on OISE and int'l at NSF for our colleagues. New program mgrs and those who've been here for years. ...

TY Outsourcing, I read an OpEd...



FR I get nervous trying to quantify these things. ...I would think some more involvement from data miners in modeling connections...

TJ Is there any gold standard in the US of the degree of preparation of say 16 year olds, some standard we can measure and build off?

EL What are the questions you'd ask them before they go out, do you know anyone from a foreign country, what do you think the advantages would be, then when they get back see what they learned.

JSlim The American council on education had a meeting Friday, a session on assessing int'l learning. A group of people discussing how do you know if the international experience for students was successful.

HS One of the constant issues is once you have all this cyberinfrastructure, how do you measure that, how do you ensure you get the most out of it?

PG One of the NSF funded activities I've been involved in is a women's project. One of its final products is about role models, women engineers. We went to NSF and other org.s and asked, why don't young girls go into engineering? Nobody could give us an answer. We did interviews of girls from all backgrounds, most came down to the same five conclusions. We make conclusions because of what we know that aren't true to these young people. If we want to know what these kids know about international, we should do something similar. Go out and ask them. There's some demographic info we have to capture to determine how to develop programs for these people.

GN It's very dynamic. It changes with time. It would be interesting to look at what the future impact would be if they don't get the basic exposure in schools (Kansas evolution example).

JP I worry about a socio-economic clash too. Some of the interest in study abroad comes with having vacations abroad, but it's a small segment of the population that can afford vacations abroad or study abroad. Probe how far the socio-economic divide goes.

KS Georgia Tech...five students. I asked the students if they had int'l experience before they studied abroad. Four out of five had. The earlier we get people int'l experiences, the better. They don't have to be outside the US, how do we develop programs for an experience without children leaving home? That also addresses the socio-economic issue.

GN There's a basic question. What is an engineer? What is the toolset an engineer should have when walking out with a degree? There's no consistency. That may be an interesting topic to address. We used to say, I can tell who is a student at a master's level that comes from a foreign institution by the way they approach a subject.

EL There's an interesting set of articles circulating that gets to those points that I'll try to get to you.

FR This would be a wonderful topic for the next meeting if we could get a speaker on it.

JP Chemistry may be the only subject that has an organization laying down guidelines as to what a chemist needs to know. You have to jump through hoops to be accredited. There's nothing about int'l in the criteria. The most recent advance in the guidelines was more explicit language on research being part of the curriculum. Globalization is not on the radar screen. To what extent could this office do outreach to that committee.

LW The American Chemical Society does have an int'l office. I'll give you a name, you can talk to him directly.

ML You're thinking that's a place to try to influence

JP If that committee says a global experience is desirable, that would...

KS There's a recognition that many students do the int'l experience. How many *science* students do the int'l?

PG One of the things is NSF can encourage universities...

EL We don't fund overseas courses. We fund students to do research, not to lay pipe.

PG You could combine research with physical activity. How does going into developing country to upgrade the water supply...?

FR Let's do a few administrative things. We didn't finish the discussion on broadening participation. We should think about is, in the past we've had a product/letter come out of this. What do we want to accomplish the rest of today and tomorrow?

KS I think the mechanism to convey info to Bement and the public, we'll finish the minutes and distribute. Those become a document of public record. The minutes will replace the letter we had been working on in the past. There's a value to do that. It will be comprehensive and we have an opportunity to gather you here, to focus on idea exchange, instead of being distracted by a letter. The chair drafts a short note to emphasize a key point or two that can be conveyed to Bement and Olsen. If there's anything immediate the committee finds important, I would say we could talk about what those would be, but not do the wordsmithing here.

FR I feel the wordsmithing would be a good thing to start here.

ML Let's go over the things we've heard so we're drawn towards a conclusion, if there is one. If the minutes are our record, we should do that a little more formally.

JA I'm not sure our most useful time has been the time we've spent wordsmithing. If we do a more targeted version of our letter, I'm concerned we won't be doing what Bement wants.

JP I'm comfortable with JA and ML's ideas. We should provide advice, but that doesn't need to come in letter form. Then the onus is on us to end the discussion with a conclusion or an outcome, otherwise we won't be doing the job we're tasked to do.

PG On the ENG board, we have a presentation and discussion. On the second day we split up the room and take each topic and meld down a few bullet points on those topics. It provides for a very succinct message to the director.

JA SBE does something like that. Will the minutes in rough form be ready?

KS If one takes the agenda and ... We can take advantage of the minute takers where they'll take down the discussion as it's presented to the whole group. Then we get the integrated minutes to the whole group and go from there.

LW If we end up focusing on one or two key recommendations, those can be put into a short letter to Bement.

JA We need to somehow get some time with the strategic plan.

GN The minutes won't be official until the beginning of next meeting.

KS We did the approval but that was to be doubly-approving them

FR We're converging to the idea of getting a few bullets for each agenda item, then take the most important and put those in a letter to the director. What we haven't done is get a process to do this. Are we ready to divide into groups?

KS You have a good opportunity to put ideas to the drafters before it gets out of the building

FR Some of these things it should be easy to say things about. Each agenda item.

GN NSF traditionally has not funded foreign nationals directly to study/research here. New NIH award is giving money to them to keep them doing science here. Is NSF moving towards that?

LW In general, the NSF practice, fellowships are different. Most of those are limited to citizens or permanent residents. Most of the other awards, if someone is employed by a US institution, they are eligible for a grant.

TY I'm on the council of NIH and ... The average age of an American investigator when they receive their first grant is 42 or 43. Lots of young scientists are being exploited by

senior faculty as post-docs. At the same time we're complaining as why US nationals don't want to go into science. Why would a person born here go through this horrible postdoc things when they're not sure if they'll get a tenure track position? This ought to be addressed by NIH. The issue that's preventing US citizens from doing these things is the opportunities aren't there. It's difficult to spend these years and not know if you'll be successful.

KS I'm not sure if the age is that different for NSF

TY That needs to be addressed.

HS The last issue of Science there's a new program for postdocs at NIH to address this.

JP Is it really all one and not the other? If NSF went the way of NIH, we would be crippling K-12 outreach efforts?

TY There's an advantage to doing what NIH is doing. ...

KS One cultural difference between us and NIH. We're a domestic funding agency. We don't fund the other side. NIH has a global mission. They have the flexibility to call out we are going to fund foreign students. What you're describing is not a real change. Two benefits, those ultimately supported are the best of a very broad competition, as we're grappling with the perception that we're no longer welcoming as a country we can point to that specifically.

JA Supporting America's future in science is not necessarily best served by keeping them here rather than finding a way to make them productive and sending them back there.

TY The only issue is now, we have lots of Chinese postdocs. As China becomes competitive, there'll be lots of Chinese trained here and going back.

JA It seems to me, is it a problem to allow that? Having a policy against that isn't something to be entered lightly.

LW There's no move in that specific direction here at NSF

FR Back to administrative issues. How do we want to proceed? Do we need to spend some time figuring out what topics each group will address?

About the Update?

KS I'd note the 7.9 percent increase

FR It's in the minutes. We want to applaud that

Group: yes we do

FR The minutes should reflect what we said about Kathryn

KS Then Kathryn would like to acknowledge that it was a team effort and it would've been impossible without their help, and in particular Larry

FR With regard to PIRE, we'll need to address that. What about the models and principles?

KS Yes, or looking more at the different management processes for joint collaboration. The partnership one is more specific to the solicitation. What are things that could be considered in the new solicitation.

FR Do we need bullets for models and principles?

KS I'm hoping the committee will spend more time on this, initial observations and reactions.

FR Broadening participations? yes. IPY? Minutes are sufficient. We saw many opportunities. Strategic plan? Yes.

LW In the requests already out to the community, NSF has asked, what is the changing environment and how do we address that in the next strategic plan?

FR NSB presentation?

KS That was intended as an FYI

FR Use the minutes to say what?

ML It provides perspective for the strategic plan.

PG Volunteers for these committees?

FR Two groups. We spend the first half hour with the first two topics. The next half hour with the other two. Then an hour and a half general committee discussion. ... Before we quit, who's going to be in what group?

PG Models and strategic plan

JP PIRE and broadening

ML PIRE

TY Models and principles

GN Models and principles

FR Then I'm in PIRE

PG Strategic plan

GN Broadening

TY Broadening

ML Strategic

TJ Strategic

JP Broadening

FR Broadening

JA As punishment for not being here tomorrow. If I'm needed for something afterwards, you can assign me to whatever.

ML The charge to the new NSB task force raises important issues for the international advisory committee ...

FR Next meeting ....

LW Position announcement for broadening participation position. We're looking at it under the traditional sense of women, minorities and disabled. We're also looking at career level, public understanding, possible use of IT, distance learning, how do we bring the excitement of int'l to the broader community. If you just want to read that, you'll understand the approach we're taking and appreciate any advice.

FR Can the minutes say we wholeheartedly approve of this?

LW In tomorrow's discussion of broadening participation, I'd hope you'll give us some advice on approaches we might take.

FR Okay, dates for next meeting.

KS Sometime in the fall. We're looking at the September to October timeframe. Does anybody know of any particular week at the moment? I have one other item. With the initiation of this as a full committee, the roster has been expanded. We have up to 15 possible members to serve on this committee now. With the new director, we know we need to expand the AC membership. If there are folks you know would be good additions, we would welcome suggestions. Please send them to me by the end of February. When people come onto the committee, there will be assigned terms to stagger membership.

TY The people you're looking for, you'd like them to be representative of different fields?  
Any area you're lacking right now?

KS We could do more in BIO, more in GEO, more in materials. Since we can almost double the AC size, we should look across disciplines. Age diversity. Having a 20 something serving would be great.

LW If we have a list of 100 people, we could come up with a good group

GN What's the service term for members?

KS Staggered one to two years. The old members have been serving for almost three years. My expectation would be a three year term going forward.

*February 10, 2006*

***Group discussion***

Models:

TY We're doing models

PG One of the things I was saying yesterday, if someone calls and wants to partner with you, obviously the model has certain kickpoints, the NSF priorities, there's an overall ranking. The other thing is education, how does it feed into bettering education. It's the US goal to better education.

GN How does it improve the level of education of the population, the children.

KS So you're thinking is that the strategic priority, how strong is that?

GN Exactly

KS For our purposes, it almost doesn't matter. It's nice if it supports their interests, but we need to look at it from our side. Does the interest we have meet the costs of the program.

PG This isn't like we're going to another country and asking them. They're coming to us and we have to select which one of them to go to.

TY It's going to depend on the partner

KS I want someone faithful, that I can talk to,

TY Two models, US can stipulate what it wants, basic science has to be the driving force. Japan vs. Ethiopia, you can't really develop a model.

PG But you can, they can come in with basic parameters.

TJ I sense there's two levels. One is if NSF is highly motivated to do this work. If they are, then you sort of have an approach towards management that's we'll make it work. There are going to be a set, maybe Kenya, while they might think education is important it may not be on the agenda and may not be on NSF's priorities.

KS The issue of whether or not to do something jointly will probably be more driven by the research area than the country involved. If Kenya is the only country with an expertise in X, and X is a strong priority, then we'll be very interested in partnering with Kenya. The question of country might come into the question of, do we have confidence the country can deliver. If we don't have the confidence then we might want to go it alone. If we have strong confidence, we might do a hybrid



Sometimes it takes time. How long a relationship have we had

GN Have we had a relationship with this country, or funding partnership might be a question to ask on every proposal. Attach a ranking to this and at the end you can have a quantitative measure of the proposal's desirability.

KS You'd want to start smaller with a partner you haven't worked with before. You might start separate and see what happens at the end of the process

GN Does the country have enough resources to be involved in the project?

KS Do we have confidence the resources for the project are there. Generally the resources might not be there, but say the gov't made...

TY What concerns me is, say you want to explore Halley's comet. I can see Japan having the resources to work with that. Kenya wouldn't have the resources, it wouldn't work

PG But these countries will be coming to you with what they want to work on

TY I can't imagine any developing countries coming to NSF to invest meager resources in anything like that

PG Women...diversity...I think sometimes we become too myopic thinking it's a certain type of quantitative...

GN Some of these developing countries have things, water conservation, forestry, that are unique to their countries that we could only do here through digital programs

PG Papua New Guinea is doing something with water where they're doing lots of research to try to prevent disease, that would be something that might fit into something NSF has. It's not some glorified thing, but something smaller NSF could work with

GN The key for us is to develop questions broad enough that would apply and be relevant for either case

KS An infrastructure question, is the other funding agency's ... capable with NSF's. There'll be less questions to be addressed if that is the case. We weigh a whole bunch of factors or issues

TY Developing countries, there are many projects, they're always conducted with USAID bankrolling.

KS we have people who come to us, water is a growing area of concern. They're not looking for the pipe to be laid tomorrow. It's part of the need, but they recognize NSF is a basic research organization. If one of their scientists has been working with an NSF

funded scientist. If they want to go beyond being the recipient of technology and want to contribute to the science in the future, they want to work with us.

TJ How can you avoid unintended consequences of a bilateral model or NSF on their own terms model. You wouldn't want to set up criteria that may ...

KS Right now, the basic approach is the parallel approach. We'll fund, the other side funds, the processes are separate. If both are successful, they go off and do stuff. There are a very small subset, they have different models. The IODP that's on the extreme side, a common funding pot. Somewhere back further on the spectrum, we have a couple closer to the hybrid parallel where there's some integration of the process but it's not totally integrated. It's driven by research. If the program feels strongly about a research area, we'll consider it.

GN Is the country the real key or the institution in that country?

KS If you had a sound partner in a stable gov't, that'll be higher confidence than a sound partner in a country with turmoil. You could have a strong country with a questionable funding partner.

GN Should the question be about the country, the institution, both, then assign a way to quantify that?

PG The NSF priorities, education, confidence level of the country/agency, previous relationship with NSF, is their management compatible with ours, broadening participation

KS I would add how close to the frontier is the ... in terms of research, are they in front of us, behind us, on the cutting edge? Where is their research level compared to ours?

TJ How motivated are we? We'll adjust our model, jump over more barriers to make partners happy?

KS Who is the driver to collaborate? If it's us, there may be more incentive to take risks for potential costs due to potential outcome

GN Should something about technology transfer, issues not in NSF's power to resolve but could become a hurdle to the project itself

KS Which legal regime takes precedence? The US jurisdiction stops at the border.

GN As the funding agency you can say it's not in the best interest of US science to get involved with this, how the processes could interfere

KS We assume we're doing basic research...

GN With basic research you have the problem of instrumentation, etc. The DOC could say no we won't grant a license.

KS What is the access of the foreign partners to US owned technology

GN That is a great question

KS I'd say control technology

EF When KS introduced the topic, beginning of a search for typology. She has developed ... She has tried to put those on a spectrum. We should validate this exercise or not. It's a project in process. The reality ... The first agreement was with Japan, JFK visited the president, it developed a rigid program. Bement wants to be able to say, based on this typology, we'd be comfortable with this type of arrangement. What does the typology call for, what would be the most productive way to get involved? We need to validate that thinking, this is a process we're still working on.

KS This is a lot further than I , this is good. The types out there have no criteria. This is fleshing out general principles.

Mystery guy When we assess programs, we have a risk grid

GN Some of this can be found in the CIA fact book. Some of these are quantified and/or qualified. The criteria in the fact book is kind of gov't validated.

Strategic Plan:

PG What should NSF consider in it's strategic plan. The education of math and science teachers in K-12.

LW The only comment I would make is we need to put the int'l spin on these. There's no question the US needs to address this, but is there an int'l element.

PG How do we assure in the process that K-12 kids are exposed to what int'l globalization is?

TY Math is the perfect conduit for globalization

PG How do you teach kids about culture, differences in the world?

TJ We were concerned, there's no way to measure what the current state is about the world beyond their neighborhood.

PG Would one of the goals be to further educate K-12, then as a subset, to determine the level of int'l awareness

TJ To establish some metrics

LW It should be even more general in the strategic plan

ML Everything should apply to all directorates

LW In the current plan, under the goals it drills down to 16 objectives, that will probably be reduced to become more big picture. We won't be inserting anything specific, how do we insert int'l into the context.

TY This is a good time to bring up technology, the world is shrinking. Before young people even travel, they can absorb so much through communication, knowing about a country, everything is on Google. They can choose how to participate. Maybe NSF could play a role in allowing children access to the entire planet.

TJ We talked about we ought to make sure the plan isn't so vague so we don't know what it's talking about. Insert global...

TY The MIT approach for global education. They make all courses available online. Countries can get a lecture in a classroom in Nairobi. NSF could facilitate such a thing. How many people can afford to enroll at MIT? Facilitate classrooms so people can get their education.

LW Congress would be interested if that was in South Dakota, but not really around the world.

TY USAID might.

LW Potentially yes.

ML That's a good example of a project, getting into specifics not going to be in the plan

PG STEM education... That sort of gets to the whole thing of improving it. Just have to ... Advance STEM education through int'l collaborations and K-12 teacher education

TJ I think we need a motivating statement, enables solution of global change problems. We're trying to enable solutions

TY Expansion of STEM education globally is a solution to many of the planet's problems. This is facilitated by many technological solutions

ML We've got lots of bullets under the heading. We don't have any headings.

PG Id ont' want it to get lost. You make that sentence so vanilla it won't do anything

TY NSF's strength is STEM

PG What I heard, the absolute need to improve STEM education in K-12. Why can't that be a strategic objective? We have to do it to remain competitive.

TY The US is lacking among the developed world in STEM in science and math

ML We don't have to base what we're doing on what the president said

PG He talked about improving the education of K-12 teachers.

TJ It's already in there. (read from the plan)

PG that's not addressing the issue of K-12 teachers. That's the problem. In ENG, that's what we've talked about for three years. That's why it has to be a strategic statement.

LW Because it's too generic, NSF has focused on university level, not K-12?

PG It's been in the plan for four years and hasn't worked

ML There's the people, ideas, tools, OE goals. Do you want to insert a new goal?

PG Yes.

ML I'm hearing lots about the importance of K-12 and not int'l

PG We put the word global in there somewhere

TY Enhancing STEM K-12 education would facilitate the competitiveness of the US globally

TJ Why does NSF have to pay for all that when DO Education is supposed to do that?

PG Our view is DO Ed. isn't making that happen, NSF needs to step up to make sure it does. It will be a failing of the nation if we don't concentrate on this aspect because we are about science and engineering, while it's on research, part of that is to figure out why kids aren't having this in K-12. To broaden participation, you have to teach them. How come women don't go into engineering? That's important. There is recognition that NSF does have to be involved. It's a chicken and the egg thing.

TY In the undergrad/grad level, for students to excel in science and math, shouldn't they have a good base from K-12?

PG Everybody ought to be exposed to this

TY There's this attitude of people, oh, I'm afraid of math. Maybe they'd be capable if they were introduced to it properly in K-12.

ML Not denying the importance, I don't see the int'l

TY Good STEM education would enhance US global competitiveness

ML You see that as something that belongs at the top level of the plan?

LW You're using global competitiveness as the reason for enhancing K-12 education

PG I thought the objective was to give thoughts to the plan period, not necessarily just int'l.

ML I'm thinking this is the int'l group, is there something int'l we need to get in there? Not to cut off other things, but change focus.

TY The fact is, US students are lagging behind in science and math compared to Korea. A nation supports NSF should expect NSF to improve that situation. NSF shouldn't be embarrassed for wanting to do that.

TJ Yes, but what about other things, let's, what other things should be added?

ML We have STEM education in K-12, link to global competitiveness, building a global workforce.

TJ Is it the role for NSF to be the leader, are we concerned that our highest priority about global scale phenomena...

PG We're concerned about natural disasters, disease

TY The arctic is melting, hurricanes, maybe NSF should form an int'l alliance with interested parties to look at why are we having these things?

PG NSF should lead an effort on world science issues such as chronological changes, natural disasters, something about disease

TY Global warming.

ML NSF should lead in addressing global problems such as climate change, infectious disease, and natural disasters

TY This is a part of the reason we're having new diseases, the climate change, travel. By making a ratio of how long it took to travel a distance a hundred years ago compared to today, I'm not an engineer.

ML I have two sentences...

TJ I have an objection that D.O. Education isn't leading on the STEM subject

TY Why did the president increase NSF's budget?

LW He didn't say NSF's budget should double, the money towards S&T...

### ***Group discussion***

PG Our group was looking at the models. Our understanding was, what questions need to be asked so when a country comes to us, we could get their answers and come up with an overall ranking. (Read questions)

FR My reaction to this is, that's part A. Part B is how do the answers tell us which of the models to use?

KS I'm not sure we have to answer that. At the end of the day, it's a case by case basis. There's variables, this captures very nicely those variables. We're further than I thought we'd be when I gave the presentation yesterday. This is a good set of questions. This is a really good start. I don't know what more needs to be done.

HS Two programs we've started from developing countries. One of the issues is some people come to Bement asking for a program because they come from their own NSF type agency. They come to NSF where it's more bottom up than they're used to. The question is, what is the long-term prospect for keeping a coordinated program that would maintain interaction between two programs. I've seen programs dwindle when managers leave.

KS That's probably another question. How can NSF ensure mgmt. over the life of the project?

HS Mgmt changes in those countries because of politicians

LW NSF should be asking if the proposed model will give the US research community more or better access to their foreign counterparts. These are management models, but the objective is to give the US community the ability to interact with the foreign community. Is the proposed model going to give US researchers more or less access?

EL This is a different approach. Most of those models come from programs, but the question is, are there other models? There's a network model in BIO. When they plan research projects... One of the things I would suggest, when you think about models, instead of having different programs to cofund proposals, is there a way to link these communities in networks. It may be a more nimble thing where you can do a network with a country or set of countries. I don't know if it would work, but how do we build int'l networks? What does that mean?

BT It's not unusual for a visiting dignitary to speak about a bilateral program of one model or another. These days things require work with more than one country. When the topic is more complex and requires more than one partner, lots of things fall through. What do you do with a multilateral effort? How do you keep the components and plug them in in these situations? Increasingly, some of the larger global projects will require solid partners in many countries.

PG Maybe if included something like that, it could be awarded more points when considering the model

FR We need to give fifteen minutes to each topic, are we trying to agree on bullet points, if so, we have nine and we added up to 12.

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FR Let's move onto the PIRE recommendations, Julio?

KS Before that, I have date issues. Two proposed dates, September 14 and 15, or the last week of October. My proposal is that we designate the 14 and 15 of September as the meeting dates.

JP PIRE conversation hinged on how programs could be structured, along the lines of broadening participation. (bullets are read)

KS the bottom two points, the pool for undergraduate institutions is significantly larger. The success rate for a 360 pool was 6 percent. With a pool ten times the size, the success rate could be one percent. From an NSF goals perspective, we could decimate the ... we're estimating we'll have 400-600 preproposals and that will tap into all of our office resources. Anything larger, we probably wouldn't be able to manage.

JP The fear that all undergrad institution will submit shouldn't be a problem. They aren't very active proposal generators. Those that are should be encouraged. Those with the infrastructure to support this would be few, shouldn't lead to a flood of applications.

TY I agree with KS, when you have a 6-7 percent funding level coming from PhD institutions, it buries some of the good applications. It might interfere with a good review system just overwhelming them. People put big efforts into this, someone goes through 15 and not much time is spent on reviewing them. Letting the funding level drop further discourages people to apply. There are outstanding institutions that could support this research, what limits them from converting to a PhD institution?

FR I've seen lots of undergrad institutions with firstclass research programs. You're leaving that possibility out. We understand the trade-offs. Big administrative burden, the danger of more people getting discouraged. That's why we were thinking of a very low effort preproposal.



KS The HSD initial effort had something like 1200 letters of intent then about 800 preproposals. Not my intention to preclude undergrad institutions from participating, but at the same time, not to open us up to a completely random possibility of having a very large response. Does the undergrad institution have to be the lead, or is being a partner adequate?

JP The reality is there are about 50 undergrad institutions that bring in lots of funding for their faculty. Faculty has developed their own research programs. These faculty want to have the independence they fought long and hard for and NSF has promoted through their REUI program.

KS In this round, it was open for the minimum 90 days then shut. Despite that, we know of multiple universities that had internally tens of proposals to choose from. If we had 5-10 props from each of those 50, that's hundreds more for us to deal with.

TY There's so many people without grants, I'm surprised that these people successful at the undergrad level aren't snatched up by PhD universities.

JP They try, they believe in their mission and don't want to leave.

EL I heard discussion from the institutional perspective, the cap wasn't artificial, it was there so the institution could put forward their best activity because their resources are put forward in this too.

TJ Could there be a compromise, every institution could send 2 or 3 instead of just one?

FR I think that's reasonable.

TY Outstanding grants should stand on their own merit. If one person can write ten great grants...

FR We haven't settled this business on undergrad institutions...I think that needs more discussion, by email

KS The reality is, we've heard the discussion, we'll try to see what we can do to address the issues put forward

Broadening participation

JP Discussion went in several directions, we ended up with three ideas. The main thread is to allow PIs to think creatively about broadening participation. (read bullets)

EL Did you have any specific advice about specific partners?

KS I liked your idea about the LTER and the ILTER programs. Building on things that already exist.

EL German's idea, NSF should seek to interact with its counterparts to come up with specific programs to target that area of the world and then come up with participants.

TY Technology could really allow that. Everything is online.

JP There are so many computer science conferences happening exclusively online

KS There could be an international K-8 thing where students could interact with kids in different countries

FR There are complications with each of those things

EL There are programs to support IT improvements at minority institutions.

ML We have a group that does distance mentoring of teachers in STEM education over the internet. They're prototyping this.

HS There's several engineering classrooms set up in Europe and Korea like that

#### Strategic Plan

ML These are the things I drew from the conversation (read bullets)

EL We had discussions on the last point on global problems. These are transformative, high-impact issues.

BT The pairing of these issues with cyberinfrastructure...

FR I think we have one more administrative thing. What would we would like to put into a letter to Bement. Are any of these bullet points that should be included?

TJ Strategic plan, for the nation to achieve what's needed in STEM education, it can't be NSF alone carrying the load. DO Education should be doing this.

FR Include the strategic plan bullets in the letter? Any other bullets from the other points to pull out?

KS I will note that the strategic plan document has still a challenge in terms of how are we in this changed int'l s and t environment going to ensure that we're able to move NSF

and the science community forward? I don't have an answer on that. People are aware of it. The strategic plan shouldn't be looking at the old strategic plan.

FR I think this has been a very productive meeting. We have a lot of work in front of us. I'll draft a letter and get comments on that. We'll comment on the minutes. There was mention made of various ways of getting feedback as individuals. We have the dates tentatively agreed on.

KS The fact that we've got most of the people here now and nobody has a problem, I'd rather say these are the dates.

FR Thank you everybody. Thanks for the work you put in as a staff.

KS Thank you all for your time the past two days. I think it's been a good meeting with some very good ideas you've provided.

(applause)