

>> Randy Phelps: Hello, and thank you for signing in to this informational webcast on the National Science Foundation's major research instrumentation program. My name is Randy Phelps from the NSF Office of Integrative Activities which coordinates this foundation-wide program in collaboration with the large number of program officers and staff within the divisions and offices here at NSF. Two of colleagues, Dr. Vicki Martin from the biological sciences directorate; and Dr. Robert Pennington from the office of cyber infrastructure, have joined me for this presentation. During the next 90 minutes, we will provide a formal presentation followed by a question and answer period to address frequently asked questions about the MRI program and also specific questions you in the on line audience may have. So please, at any time during this webcast, send your questions by e-mail to info at TVworldwide.com. They will be collected and brought to us by members of our OIA team -- Brandon Stevens and Gerry Farves and who are off camera. If we are unable to answer

your question during this time, we will follow up with a response in the next several days. However, if a question wholly or substantively duplicates one we have addressed on air, we may defer to the online answer as a response. If you do not receive a follow-up response, please feel free to send us an e-mail to MRI@nsf.gov, if you don't feel your specific answer has been addressed. Also I'd like to point out this webcast will be archived and transcripts will be available through the TV worldwide website. So again, if you have questions during the course of this webcast, please send e-mail to info@TVworldwide.com. So over the course of the next 90 minutes this is the -- what we hope to convey to you as part of our presentation. Starting with an over view of NSF and NSF proposals, very briefly. And also then an overview of the MRI program specifically. I'll also mention information about the upcoming FY 2012 MRI competition and provide a rather in-depth summary of the MRI outcomes in the last competition in 2011. Then we will provide some general guidance to MRI proposals specifically what makes a proposal fail and what might make a proposal actually competitive in the MRI program. At any time I of course invite my colleagues to chime in during the presentation to provide their insights. So first, NSF, physically is located in Arlington, Virginia, but perhaps more importantly, it's located virtually at the website that I've listed there, www.nsf.gov. NSF is an independent federal agency that has a budget of approximately \$7 billion and we fund approximately 20% of federally funded research at the nation's colleges and universities. Unlike many other federal agencies, NSF is what I call a bottom-up agency. We are not a mission-driven agency, but we accept proposals from the community and try and fund those good ideas that come from the science and engineering research communities. In order to do that we have a number of funding opportunity mechanisms. The first two are basically program descriptions, one published on the NSF website, the program description that's listed there. And also in a document that might be called -- what we call program announcement. There's also a mechanism called a program solicitation. And this is a published document with additional restrictions and requirements

compared to those that are in the grant proposal guide which are the guidance for the first two funding mechanisms listed. Proposals must follow both the solicitation and the GPG, as we call, it the grand proposal guide, instructions. But it's important to note when there is a difference, the solicitation takes precedence over the grant proposal guide. Also a mechanism called a Dear Colleague letter, a notification of opportunities or special competitions for supplements to existing NSF awards. But MRI has a program solicitation, as you may well know, of the current one is 11-503. I'm going to concentrate talking about solicitations and also then again of course the MRI solicitation in particular. Most of the proposals that come to NSF, are submitted through the fast lane mechanism. And the guidance for submitting proposals through fast lane are found in the proposal and award policies and procedures guide, doesn't really flow off the tongue, but the first part of that which is important when you're submitting a proposal is as I mentioned, the grant proposal guide or the GPG. This provides guidance for preparation and submission of NSF proposals. And I encourage everyone who is planning to submit a proposal to NSF, to become intimately familiar with this document because it provides a lot of the guidance that you need to follow in order to submit a proposal to NSF that follows all of the guidelines that are required by the foundation. The second part of the P A P PG, it provides guidance on managing and monitoring awards should you be lucky enough at the end of a particular competition to receive a NSF award. The current document that you need to follow is numbered 11-1, and again, proposals submitted on or due after January 2011. The most current version. A number of proposals are submitted through the grants.gov, mechanism. This describes the preparations for proposals again submitted through grants.gov, in our application guide which can be found on the NSF website. It's important to note, however, that simultaneously submitted linked collaborative proposals must be submitted through fastlane because grants.gov, does not currently support this type of proposal submission. There are two types of mechanisms to submit proposals where funding might be shared amongst institutions. One of them is through a standard award to an institution with sub awards that send money to other institutions. Or you can submit a linked collaborative proposal where an identical proposal as submitted to NSF with a couple of exceptions, one being the budget, one being the biographical sketches, the proposals are otherwise identical. And in that case we call that a linked collaborative proposal. And that again, that mechanism is not able -- that type of proposal is not able to be submitted through grants.gov. So now I'll talk specifically about the Major Research Instrumentation program which as I mentioned is coordinated by our office, the office of integrated activities, in collaboration with directorates and offices across NSF. If there's one take-away you want to have, it would this website listed under the title here. It is the Office of Integrative Activities, MRI-specific website and it provides a lot of information that will be of use to you if you're planning to submit a proposal for the MRI program. I'll start from the sort of top level and talk about the strategic goals of MRI, and basically there's a lot of words here, but it's really -- it really comes down to one of two things. You can submit a proposal for the acquisition of an instrument, or the development of an instrument. Acquisition is much as you would guess it would be. When you have a vendor who can provide the capability that you need, you and your institutions submits a purchase order and that instrument comes and you plug it in basically,

and you're up and running with very little risk and very little time frame other than the installation right off the bat. Development proposals are somewhat different. And that's when you have a capability that you need but that capability does not exist from a commercial vendor, So to support the next generation of major instrumentation resulting in new instruments more widely used and open up areas of new areas of research and research training. Another strategic goal of MRI and I should have highlighted it here because it is a critically important part of the MRI program is to integrate education with research. I'll come back to that in just a few moments. First what I want to do, because one of the questions we get a lot is, is my proposal an instrument development proposal? And this is important because if you're familiar with MRI, you know there are institutional submission limits for the program. In particular, an institution is free to submit up to 2 proposals, but also a third proposal may be submitted if at least one of those proposals is for instrument development. So it's very important, if you're submitting three proposals, that at least one of them be defined as instrumental development. As a result. We get a lot of questions, what is it that makes for a development proposal. And there is no hard line that defines what an acquisition is versus a development proposal. But there is some guidance that we can provide and I've listed here a number of characteristics of development proposals and as I point out at the bottom although not all of these are required in order to qualify as an instrument development proposal, the more characteristics that apply, the more solidly a proposal will be considered a development proposal. That's even if there's a substantial acquisition of component parts. So going through this list, some characteristics of development proposals, as considered by the MRI program is again that it provides new capabilities not available from vendors. Also, one thing to think about is does a development effort require design work. And that design work should be done in-house and not relying on published designs. If it's a published design, then the development work has likely been done by another person, and wouldn't be considered to be as much of a development effort by the MRI program. Development proposals also require a team that brings a variety of skills to the project. The more diversity of talents needed, the more likely that is to be a development proposal. Requires many person hours, more so than simple assembly of purchase parts. The time frame for completion is longer. We allow for up to 5 years for development efforts as opposed to three years for instrument acquisition proposals.

>> I'm Rob Pennington. I'm in if the office of cyber infrastructure and the address one of the questions that often comes up with the relating to cyber infrastructure, development proposals in cyber infrastructure often have a very strong software component. Hardware for development but also the software to make a new instrument functional.

>> Okay, thank you for that. And continuing on, in terms of general characteristics. And this one may not apply to everything, especially if there's software involved. Because a machine shop wouldn't necessarily be required to develop software. But for example, in a physical instrument, if a machine shop or a test bed is necessary to fabricate or test unique components. Test beds may be applicable in a variety of different areas. And this is a very important part of a instrument development proposal. They have potential risks. If you're deciding that you need to have a particular characteristic, a particular resolution, a particular throughput, speed, resolution, et cetera, then you may or may not

be able to attain that at the first crack and you may have to have a risk mitigation plan to allow to you redefine the problem and approach it from a slightly different angle to obtain the capabilities you need in a newly designed instrument. So again not all of these apply for any given instrument development proposal necessarily. But again, the more that they do apply, the more likely your proposal is going to be considered to be a development proposal. A couple of cautionary notes. The first one relating specifically to the development efforts. We do encourage the involvement of private sector partners. But private sector partners, commercial entities are not able to submit MRI proposals. However, they can be involved in the instrument development. But outsourcing the development effort to a private sector partner, that is defining some specifications that you need for an instrument, sending that off to a company, having them do all the work and have them provide that instrument to you at your academic institution, for example, that would be considered a custom acquisition proposal by MRI and the key word there is acquisition. That is the proposal would be considered to be an acquisition proposal and would potentially be returned without review if it exceeded the submission limits for a particular institution. Also, simple acquisition of acquired components to create a new capability is most likely an acquisition proposal. By training, I'm an astronomer and we sometimes get requests for example to purchase a telescope with a CCD camera or spectrograph and put into an observatory dome. That is acquisition of those components that's not developing a new capability that is not able to be provided by a vendor. So the next section is about cyber infrastructure, and since our resident expert is sitting at the table, I will ask Rob to chime in and talk about proposals for cyber infrastructure.

>> Rob: The office of cyber infrastructure NSF, proposed interested in proposals relate together national cyber infrastructure. We are supporting and very interested in acquisition and development proposals on a single research instrument. On the topic of cyber infrastructure. This can be computational, data intensive, networking, visualization, or a combination of those four things. So the point of the cyber infrastructure proposals should support the development of computational and data intensive science and engineering programs, or provide pathways to regional and national infrastructure.

>> Okay. The second bullet I've already addressed, and that's another goal of the MRI program is to promote substantive and meaningful partnerships for instrument development between the academic and private sector. So again, creating innovative ideas or products with wide scientific or commercial impact is a desirable feature of an MRI proposal. So there are a couple of key things that I would like to address here. Because we get a lot of questions about these kinds of efforts. And there are things that MRI funds and there are things that MRI does not fund. And it's important to note that MRI is a research instrumentation instrument program. So we provide for the acquisition or development of a research instrument. What MRI does not support is listed on this slide. This is a rather long list but a rather comprehensive list, and I encourage everyone to take a look at this. Because anything that would fall into these categories is not an MRI-eligible expense and cannot be provided as a request for -- from NSF -- NSF cannot provide this as part of a request to the MRI program. Nor can anything on this list be used as cost sharing if in fact cost sharing is required by your institution. So I'll just scroll down to the list, construction

renovation and modernization of rooms, buildings or research facilities. We can provide an instrument to go into a room, but we cannot provide funds to renovate that room or to enhance its infrastructure in order to accommodate that instrument. Also, large specialized experimental facilities. NSF -- MRI program does not fund facilities. By that we mean things that are constructed with significant amounts of common building material using standard building techniques. As instruments get larger and larger, some of the characteristics of those requests become more like facilities and they incorporate costs that are not a MRI will support. Also, general purpose and supporting equipment. For example, general purpose computers, laboratory equipment, fume hoods, cryogen storage systems, things that if you move the instrument to another room would stay behind and be repurposed for other reasons, those are things that are MRI will not support. Sustaining infrastructure and building systems. Again, things like electrical, plumbing, HVAC, toxic waste, telecommunications, phones and things like that. Also, under a general category of general purpose platforms or environments, MRI does not fund fixed, nonfixed, structures or platforms or manned vehicle. We will not fund a helicopter for example as a piece of Major Research Instrumentation. And also, instrumentation used primarily for science and engineering, education course. Remember I said that MRI is a research and research training program. That means real research is undertaken with the instruments, and student involvement that might lead to publishable research, for example at national conferences, co-author and refereed paper, for example, or presented on campus student research competition. That's what we mean by research training. If the instrument is going to be used in a classroom setting, that would be something that might be considered broader impact, but it is not the primary purpose of a MRI instrumentation award. Also, the solicitation is rather clear in stating that MRI funds -- will fund acquisition or development of an instrument or multiple pieces of equipment that together serves as an integrated research instrument. MRI does not support requests for multiple instruments to outfit labs or facilities. So those are some of the most common questions we get, can we ask for multiple peer level instruments to outfit a lab. The answer is no. And the next question often is well, then, I have a couple of pieces of equipment that together I need to request. Do they serve as an integrated research instrument. So again, there's no hard and fast line. The case is yours to make. But some characteristics to look for are listed here. And starting from the top, basically you have multiple pieces of equipment and you want to determine whether or not they're an integrated research instrument, consider whether the ensemble of equipment defining the instrument enables a specific experiment or type of experiment to be undertaken. Removing an element would preclude an experiment from occurring or succeeding. If in fact you need those two, maybe three pieces of equipment in order to complete the experiment, it may well be considered to be an integrated research instrument. Again, also, having for example one or two pieces independently would serve little or no useful purpose. They would basically sit in the corner collecting dust. Also, if the components are so interconnected, physically or virtually, that if a core component were relocated, all pieces would follow and would not be repurposed. If that's the case, it may well be considered to be an integrated research instrument. And again, peer level instruments usable independently are not integrated instruments even though they may integrate research disciplines. So example, if

you need a mass SPEC and you need a NMR, and whatever to undertake research in the area of -- and fill in the blank here. That doesn't make those pieces of equipment integrated as a research instrument. Even though they may be used to understand a broad range of scientific questions. Now I will defer to our resident expert in biology to talk about a frequent question we often get, and that is the difference between what NSF would support and perhaps the National Institutes of Health.

>> Thanks, Randy. I get this question periodically every other day, about. Whether or not certain types of equipment will be funded by the MRI program that are involved in NIH-related projects. And on this slide are some things that will not be funded via the MRI program and so those specific instruments that will be used in medical education, such as in medical classes, are not fundable via the MRI program. And instruments that are intended for research with disease-related goals, that include work on the etiology or diagnosis or treatment or of physical or mental diseases, abnormalities, or malfunction in human beings or animals, are not fundable through this program. Instruments that are intended for animal models of the above conditions are not development and/or testing of drugs or procedures for the treatment of fundable under the program. And instruments whose intent is for the the above conditions are also not funded by this program. However, the MRI program will fund instrumentation for bioengineering research, with diagnostic related or treatment-related goals that apply engineering principles to problems in biology and medicine while advancing engineering knowledge and instruments also that will aid persons with disability in terms of a bioengineering are available for funding through the program. The program will also fund instruments that will be used in bioinformatics and biocomputing. And if you have any specific questions on your proposal, I'll put Vicki on the spot and have you submit those questions and hopefully she can address them here. Again, the questions we get for MRI, these happen to be some of the most frequently asked ones. Okay, so the basics of MRI proposals. I mentioned early on that there are restrictions on organizations submission eligibility. And also submission limits. So in particular the types of institutions that are able to submit to the MRI program, I'll talk about in the next few moments. But I want to point out again that there is a submission limit. Most institutions that submit to MRI have internal competitions that are going on at about this time or have concluded by this time to determine which of the proposals can come to the MRI program and be considered. Again, institutions are able to freely submit two proposals to the MRI program, and a third proposal may be submitted if at least one of those three proposals is for instrument development. We often get the question, is it only one proposal that can be for instrument development and the answer is no. All three of the proposals could be for instrument development. Two of the proposals could be for instrument development. Or just one. As long as one of those three proposals is for instrument development. Three proposals may be submitted. Also, it's important to note and this is been around since 2007 for the MRI program after having gone away for a short period of time. Cost sharing is required at the level of 30% of the total project cost for Ph.D. granting institutions, and non-degree granting organizations. And I'll talk about those characteristics here in just a few moments. But again, cost sharing is required for Ph.D. granting institutions and non-degree granting organizations. Cost sharing is not, however, required for

what is categorized as a non-Ph.D. granting institution, as defined by the MRI program. And I want to point out and I'll come back to in this in a few moments, that is slightly different than the definition given research at undergrad institutions, RUI, program announcements. If you're thinking you're one of these non-Ph.D. granting institution, pay attention in the next few minutes about the requirements of MRI versus RUI. Also, the merit review. At the time of submission, PIs are asked to identify a NSF division to review the proposal. So for example, if you think your proposal is relevant to the biodirectorate, the Dr. Martin handles all of the proposals for the biodirectorate and the division of biological infrastructure, so you would select DBI, as the unit of consideration there. If you happen to think that it has a chemistry component, too you may also select a second division, for example, chemistry or any secondary or third or fourth division as you see appropriate. So but it is important you select one unit as the primary unit for consideration, and by the way, that unit should not be the Office of Integrative Activities. So do not select OIA as your primary unit. Select one of the research divisions that you think has relevance for your proposal. However, an important caveat is that NSF reserves the right to place proposals in the appropriate division for review. Even though you may think it belongs in a particular division, that may not be the best home for it so we do reserve the right to place proposals in the appropriate divisions for review. And again, it's important to be familiar with the grant proposal guide, the current version of the grant proposal guide, which at the moment is 11-1. And again, if you think you know what the GPG says because you submitted a proposal three years ago, don't do that because, again, rules do change and it's important to be up to date not only on the GPG, but also the current MRI solicitation. So again, organizations that are eligible to submit proposals are institutions of higher education, and these are the broad categories. Not for profit, non-degree granting domestic U.S. organizations. And those are defined here. That include, for example, independent museums, science centers, observatories, research laboratories, professional societies, and similar organizations that are directly associated with the nation's research or educational activities. It's important to note here that these organizations must have an independent permanent administrative organization, for example but not limited to an office of sponsored projects, or sponsored research, located in the United States its territories or possessions and importantly have 501(c)3 tax status. Also, organizations that are eligible to submit include legally incorporated, not for profit consortia, including two or more submission-eligible organizations as described in items 1 or 2. There are such entities that are consortia of MRI-eligible submitting organizations and it is possible for that legally incorporated consortia to submit proposals, again, on behalf of the consortium. So I've mentioned these categorizations earlier. And I'll list them here again the classification of the organizations in those categories, are PhD granting institutions of higher education and non-ph.D. granting institutions of higher education, as well as non-degree granting organizations. And they're carefully defined here and in particular to note that the Ph.D. versus non-Ph.D. granting institutions of higher institutions depend whether or not 20s or more Ph.D.s are awarded in those particular disciplines as well as whether or not the Institution awards master's and/or bachelor's degrees. If you think you're an academic institution, please take a look at those definitions and make sure you certify when you submit a MRI application, sponsored project

office has to provide a certification defining the institution as a Ph.D. granting institution of higher education, or non-Ph.D. granting institution of education. Or a nondegree granting award -- organization. So it is important again to put yourself in the right category and provide a certification as a supplemental document in the MRI solicitation that defines the institution in one of these ways. One of the biggest errors that occur when a proposal is submitted, is that the lettered documenting this institution type is not provided. And we have to have that because the cost sharing requirement is -- depends upon with where you fit in this group of three institutions. Again, only non-Ph.D. granting institutions of higher education are exempt from the cost sharing requirement and that's a result of the America competes act public law. That exempts those kinds of institutions. So I point out here, again, note the distinction between these types of institutions. And it's important to note, for example, and we do get some confusion in this area, that an organization that is not Ph.D. granting, is not necessarily non-Ph.D. granting. So that's an important distinction. Just because you're defined as a not -- if you think you're not a Ph.D. granting organization, you may be and probably are if you're not an academic institution, a nondegree granting organization. A little confusing but it's an important distinction, again because of cost sharing requirements. And also, as I mentioned, please note that if you are a non-Ph.D. granting institution, you may be tempted to submit a proposal with RUI, research at undergraduate institutions documentation and that is not allowable by the MRI program. RUI proposals, if you're familiar with them, allow for 5-page impact statement. That is not allowed in the MRI program. And also in particular a certification RUI eligibility is not the same thing as certifying yourself as a non-Ph.D. granting institution. If you certify yourself that way, we're going to have to go back and have you resubmit as a non-Ph.D. granting institution if in fact that qualifies. So just briefly, the upcoming competition, since the MRI program we are currently using the previous year's solicitation, NSF 11-503, is not substantively different than the previous year's competition in terms of the rules and I'll briefly mention the characteristics we expect for this current upcoming competition. Again, instrument acquisition or development, and I mentioned earlier that acquisition proposals may be for three years and instrument development may be for up to 5 years. We are hoping for a \$90 million budget for MRI in FY 12. We don't have that number finalized yet so we don't know what we have. Everything I say is predicated on the availability of funds. And also of course to subject -- subject to proposal quality. So if we have a budget of \$90 million, we expect to have approximately 150 to 175 awards overall. And we will be setting aside up to \$35 million for proposals that are over \$1 million up to the \$4 million cap to ensure that the most meritorious large proposals are able to be awarded across the foundation. So the anticipated award size, again, in this solicitation listed that the minimum request for NSF, MRI proposals is \$100,000. Going up to a maximum of \$4 million. Again, for either acquisition or development. However, it's important to note that there is no minimum for proposals from non-Ph.D. granting institutions or for proposals from mathematical and social, behavioral and economic sciences from any type of institution. There are some significant changes that began back in the FY 11 competition. I'm not going to list them again here because they were there in the last competition but I will point out a few things

that will come back to. One is data management plan. Became a requirement for NSF proposals starting in FY 11. And also inclusion of voluntary committed cost sharing is prohibited. So MRI has a requirement for 30% cost sharing requirement for those institutions that are required to cost share. That number must be 30%, no less, and in fact no higher. If you are not required to cost share, you are not able to cost share. So those are important distinctions that you need to be aware of if you're submitting a proposal. And there are some other characteristics here that I won't go over. Less major than the ones that I listed here. But they are new to the MRI solicitation last year. So make sure that if you miss them last year, for example, that you're certainly aware of them this year. So I think it's important to be able to see what the past MRI competitions, what the outcomes were, because it gives you a sense of what you might be able to expect for the current MRI competition. So just, these numbers are hot off the presses thanks to Brandon Stephens, our science assistant who provided them. And they give a good snapshot of the overall MRI competition this last year. We received and reviewed -- we reviewed 859 MRI proposals, some were not deemed to be compliant and were returned without review. And we'll come back to that in just a few moments as well. We often get the question about how many of those proposals are actually for instrument acquisition versus development, and roughly 20 to 25% of the proposals we receive on a year in, year basis, are for instrument development. This last year, we received just over half billion dollars in requested funds for MRI and needless to say we doesn't have that much money. So you can go through and take a look at the characteristics of the awards and the dollars requested in the awards. I'll come back to the dollars requested there, if you want to keep those numbers in mind. The mean dollar request was \$671,000 and median \$477,000. But more importantly from my perspective is the number awards which was -- we got up to 187, and that's due in part to co funding from various divisions in our office of experimental programs to stimulate competitive research, which I'll come back to. And again, the success rate for development versus acquisition proposals mirrored pretty much the requests we received for those types of proposals. So as you can see here, again, the NSF amount awarded was a little over \$100 million. Even though the budget for MRI last year was also \$90 million. So again, that reflects a co funding from across the foundation from various programs and also our EPSCoR office, the overall success rate was higher than we actually expected, a little over 20%. Which is lower than it has been over the -- a number of years ago. In part due to the fact that the number of requests tend -- is a little bit higher but also the mean dollar request has also gone up. So the number of institutions that participated and we're rather proud of this at NSF, was over 450. We had 462 institutions that participated and 169 institutions received awards. I point that out because the number of awards was 187. That means institutions do receive and can receive multiple awards. So submitting your maximum number of proposals does help your success rate in the MRI program. Any comments from my colleagues at this point? So by institution type, again we've broken up the institutions in the program by Ph.D. granting, non-Ph.D. granting and nondegree granting organizations. And again, we're rather proud of this fact that if you take a look at this success rate which is the third row from the bottom, if that's what I really want to point out, the success rate is rather comparable. Just under 21% for Ph.D. granting institution, around 24% for nonPh.D., and 22% for nondegree

granting institution organizations we have also added a column here for a minority serving institutions. We've received only 75 proposals. Similar to what we typically receive. We would of course like to receive more. But I would also like to point out that the success rate for MS Is, which include HBC, historically black colleges and universities and Hispanic serving institution, Native Alaskan, Native Hawaiians, et cetera, the success rate is 24%, again, comparable to all of the other institutions types. There are differences in a dollar values of requests among various institutions, as you may expect. Research intensive universities come in with larger requests typically than do non Ph.D granting institutions, for example. These are some numbers that you can parse through. You have this available on line, we'll also post this presentation on our OIA/MRI website and they'll be available in the archival website broadcast here. On TV worldwide's site. So I mentioned the experimental program to stimulate competitive research, which is a program that supports states and -- well, jurisdiction, which include 27 states and Puerto Rico and the U.S. Virgin Islands, here as NSF. That receive I believe the number is .75% or less of the NSF award portfolio dollars, I could be wrong about, that but it's -- those that do not receive a larger share of the NSF funding. So those states, and again I'll show a picture here in just a moment of their distribution, but again the thing I want point out here is the EPSCOR, success rate is 25%, which is again comparable to all another institution types, even though this is a jurisdiction, geographic distribution of awards. Our office of EPSCOR, co funds a number of proposals through these EPSCOR jurisdictions and the award dollars are listed there as well. So this is confetti on a cupcake picture. If you will. Of the award definition in FY 11. The green states are the EPSCoR jurisdiction, not showing up very well. But again you'll have this available to you. But it does slightly show up there. It shows the color coding in our various research directorates and offices. And not that that's as significant on a map like, this but it does show that we do get a wide range of awards across a wide range of states from a wide range of our research divisions, here at NSF. So one of the things we do look for in the MRI program is a portfolio balance which includes institutions, institution types, and geographic balance as well as balance among our demographics of our PIs and so on. Here, again, this graphically shows the award distribution this past year. So now I'm going to talk briefly about what makes a MRI proposal fail and what makes a MRI proposal competitive. I here again encourage my colleagues to chime in. Our office again coordinates the overall program but the proposals are reviewed in the various divisions so my colleagues here at the table have the expertise in handling panels and so on and can certainly chime in and tell what you the panel and review process is like. So my first list here is a rather general one and I won't go into it in great detail. But it comes down to the fact that before you ever consider to submit a proposal to NSF, it's important for you to understand NSF. And there are multiple ways, there are multiple ways of doing that. And I've listed them here. Know the NSF website, search recent awards. Identify appropriate funding opportunities whether that's MRI, or other instrumentation programs across the foundation. At the back toward the back of the MRI solicitation, is listed a number of other NSF-wide, or NSF, division specific instrumentation programs that may have relevance to you. So make sure you understand the best place for your proposal to go. Talk to program officers and divisions where you fit. If you think you have a proposal that should go to our geo sciences, ocean sciences,

division, then give a call to the program officer in that division and find out whether or not that's the right place for you. Also, knowing the grant proposal guide, it's not light reading at bedtime but still whenever you find an opportunity to read it more than once, make sure you understand what the rules of the guidance is in that current GPG. Know the program purpose and goals. Read the solicitation. I realize the MRI solicitation in particular is rather lengthy. Contains a lot of information. But it's important to know what's in that solicitation. And also, one of the things that serves you best in submitting a MRI or NSF proposal is to serve as a panelist when possible. We have very strict conflict of interest rules, you may not be able to review a proposal if in fact you have a conflict with that proposal or in a panel. But I encourage you to send one-page two-page biographical sketch to a program officer where you think you might fit and volunteer to serve as a panelist. Talk to successful PIs. And of course, know NSF role compared to other federal agencies, as Dr. Martin alluded to in particular in the case of NIH, versus NSF. So here again what makes MRI proposal fail before the review? Now, used to have a slide that had an number of reasons why a proposal will be returned without review, and I thought I would not do that this time because all of that information is contained in the solicitation. But there are multiple reasons why your proposal will be sent back before it's ever reviewed. And among those reasons are not addressing separately the intellectual merit and the broader impact of the proposal and the project summary, for example, that is something that the National Science Board said that all proposals must have. The easiest way to do that is to say, intellectual merit and broader impact. And then we don't have to question whether or not you've addressed them separately. If font size is too small, that's another reason. If your project summary exceeds 1 page, if the project description exceeds 15 pages. There is a long list. And please make sure that you're aware of that. And the MRI solicitation, and I'm not sure it's unique at the foundation, but certainly was one of the first, I think, and certainly one of the few, perhaps, has a checklist in the proposal that says what you need and what you can't do in order to make your proposal compliant. Please make sure you use that in order to make sure that you have not missed something very important when submitting a proposal. There's nothing worse than having a proposal not even be reviewed once you spend all the time and hard work in putting it together. Another big take-away that I will provide out of this. I have -- I get up on my soapbox a couple of times and this is one of those. And that is submit early and check what was received at NSF is what you intended to submit. If you submit days and weeks beforehand, and print out your proposal and look at it, and see that it isn't what you thought that you wanted to submit, then you can resubmit it before the deadline. Once the deadline passes, you cannot do that. There's nothing quite so painful to me, one or two or five days afterwards to have somebody say that this is not what I intended to submit. The abstract -- the proposal summary is two and a half pages. Clearly not right. Like well, we passed the deadline. And there's nothing we can do about that. And this graph, which again Brandon put together for me just before this presentation, I think is so dramatic. And it tells -- I understand what deadlines are for. But when you push the deadline too close, and you have not submitted correctly, then you may well have jeopardized your entire proposal. This is the graph showing the number of proposals received as a function of time. And you'll notice the

blocks of time are in days before the proposal deadline. In fact, we go, the first line to the left of the right axis shows that block is Thursday. Then there's Wednesday and Tuesday. So between Tuesday and Thursday, the vast majority of the proposals were submitted. And I think Brandon, if you want to shout out, if I'm incorrect, 83% of the proposals were submitted on the day of the deadline. And 50% of the proposals were submitted within two hours of the deadline. So when you push it that close, and you've made a mistake, there's nothing that can be done. You can always, however, revise and submit proposals prior to the deadline if you do it well in advance. And I put it to you that perhaps two days is not well enough in advance. And also, again, just to reemphasize, do not submit a proposal and assume that what NSF has received is exactly what you intended. Because sometimes there are problems. Print out what NSF has received through fastlane and check it before the deadline and make sure that it is what you intended to submit. I will move on. So, what makes a MRI proposal fail during the review? There are a number of characteristics and we're running a little bit short of time in making sure we have a lot of time for questions. So I will go through this relatively quickly, but it is important. Because these are things that make proposals weak. And again, my colleagues, please feel free to chime in if there's something that you would like to clarify or if there are other pieces of information. Institutional commitment is something that is important in MRI proposals. MRI awards are considered to be institution awards. They build capacity at institutions. So it's important that the institution demonstrates through a letter that's allowed as a supplemental document, a letter of operations and maintenance support, in particular, for this particular proposal. And in fact the now the requirement for MRI is the institution must describe the status of all MRI awards to that institution within the last 5 years as part of the operations and maintenance letter. So again, a strong management plan, within the project description the proposal must address the management plan. For example, by whom the instrument will be utilized, operated and maintained and how -- allocation of the time is going to be provided. Proposals that don't demonstrate shared use within the institution or among institutions and/or among institutions also weaken a proposal. MRI is considered to be a shared use instrumentation program. And not addressing the shared use aspect of it tends to make a proposal rather weak. Also, proposals that are not -- that request instrumentation that are not otherwise accessible. If there's another instrument at a college next door and they're not using it, and you haven't demonstrated that you're not able to use it, reviewers tend to be savvy about that and they won't understand why it is that you need another one when there's another one that's not being heavily utilized within ready access for you. Again, that may not be the case. You may not have access to it. But you need to address that. I also allude to the budgets. Proposals that do not adequately match the budget to the scope of the project tend to be weak. And that doesn't mean that you have to have a budget request that's right at the mean request for the previous year. That may not be appropriate for you. You should always ask for what you need, no more and no less. And also, proposals that don't describe research training. Particularly again for groups that are underrepresented in science and engineering or persons with disabilities. If my colleagues would like to chime in, I welcome that.

>> Vicki: Randy, I'd like to say a couple things. One about a strong management plan, It also has to be a realistic management plan.

Often times I see PIs saying that they will use the instrument in research, where you have 100 researchers that are going to have access to the instrument over time. And they're going to use it in classes and 600 students will have access to it, there aren't enough hours in the day for all of these people to have access to this instrument over a period of time. So it must be a very realistic management plan. Second thing has to do with the research training. We see a lot of proposals that come in that say we're going to use the instrument in teaching and in student research. You need to go beyond that and tell us specifically how are you going to use the instrument in classes? How are you going to use the instrument in student research? What are the research opportunities? What are the students going to be doing? So it is expected that you will go beyond just those basic information, and tell us exactly what you have in mind. Broader impacts need to be broader impacts and it needs to indicate to the reviewers that you put some time into the thinking of the broader impacts.

>> I can comment on the cyber infrastructure proposals. Matching the budget to the scope of the project in the request to pay for a cyber infrastructure proposal, you should be able to clearly justify exactly what you're proposing to buy and describe very explicitly, including (indiscernible) documents. Say you need a system that is able to do the following things, you should be able to justify that in terms of the science or the research training that will be done. And able to draw the picture that says, this is what will be purchased and this is how we will use it.

>> I think that's good advice for a number of different areas, not just cyber infrastructure as well. Okay. So turning now to perhaps a little bit more positive, what is it that makes a MRI proposal competitive? And I often get requests to talk about what makes a MRI proposal successful and I can't do that. Because -- but I can tell what you tends to make a proposal competitive. I point out here again that due in part, large part, to the budget limitations, the success rate for MRI is only 20 to 25%. So in fact you may write a very good proposal that has very strong reviews, and it may not get funded just because we don't have enough money to support all of the good projects that come before us, again I mentioned that we get this last year we reviewed 859 proposals and only requesting over half billion dollars, but we only had \$90 million to support those particular proposals. So an obvious first step is to avoid all the pitfalls that have already been mentioned. But I'll put it to you concluding a little bit later, that's not enough. But I can give you some general advice, based on the number of years that I've been working on the program. First and foremost is to build your case on its merits and I have here listed the intellectual merit and the broader impacts. Those are the overriding concerns, review criteria, I should say, that are used to evaluate proposals across the foundation. But I've also elaborated more on additional characteristics that I think are important. They're not inclusive by any means but some things that I tend to see. One is, of course, to describe and put in parentheses, enthusiastically. Compelling research and research training activities to be undertaken with the instrument. And while it may seem this is enough, but buy it or build it and they will come is not necessarily good vision for a proposal. It is true if you put in a brand-new 500 megahertz, you provide new opportunities may not foresee but just saying that we need an instrument because it will open up new opportunities, to buy it and they will come rationale tends not to make a proposal especially compelling. Also, demonstrate how

your activities will make meaningful contributions within and across disciplines in research and research training. In particular, why is it that you are the ones that are best able or positioned to make the contribution that you're going to describe? Again, the more unique you can make your particular contributions, the better off your proposal is going to stand compared to the multiple institutions that are asking for the same type of instrumentation to accomplish much the same way in the same way of research and research training. Again, establishing a need is usually not enough -- doesn't everybody need a new instrument to do their research? Yes? But that again doesn't make for an especially compelling proposal. And again, match your proposed effort to the mission and goals of your institution. I mentioned that MRI is -- builds institutional capacity. If an instrument has a particular niche that -- enables something to be done at your institutions that is a priority for your institution, that can make a proposal a little bit stronger. If you have, for example, a partnership with local industry to provide interns and this instrument will provide for new opportunities for students to gain research in an industrial environment, I'm making some of these up, these are just characteristics that may apply. They may not apply. Whatever makes your particular institutional goals achievable with this instrument, makes a proposal stronger. Also, demonstrate appropriate leadership and commitment to bring the project to completion. That is a make sure that you're a good manager of the instrument. I point out here that being a good research scientist is one thing. Being a good educator is one thing. But being a good manager of a complex instrument may well be another thing. So you make sure in that management plan that you convincingly demonstrate that this is going to be a very successful project in its outcome. How would the project enable the integration of research and education. And I mention again the MRI is a research and research training program. And I'll leave it at that. How would the project enable integrating diversity into NSF programs projects and activities, again, in broadening participation is an important part of all NSF proposals and MRI looks very closely at that. But where proposals can go astray is saying we will do it, that's not enough. Sometimes institutions are located geographically in an area that has a large number of minority students or institution has a large number of minority students and that's the extent that the proposal describes their efforts with minority involvement. And that doesn't cut it because in particular since you have that opportunity you should take advantage of it and really describe in the proposal how you are going to broaden participation in science and engineering. And again, avoid pit falls. Don't do this. But again, don't do this will not guarantee a competitive proposal. And this is an important thing. Particularly when you get questions from people who are resubmitting proposals and they're addressing reviewer comments. Minimizing the negatives does not necessarily make for a strong proposal. So again, your proposal may be technically flawless but is it actually compelling in so coming close to the end here, I want to point out again the opposite of do this, don't do this, doesn't give me the answer of what it is you should do. So there are wide range of possible approaches, strategies, and designs for your proposal and it's up to you to make that case. And I encourage you, and again I mention that I sometimes get on a soapbox and this is another one. It sounds somewhat trite, if you will, a little bit simple. But when people write proposals, they're writing in order to tell a story. But the reviewers are the ones who are sitting there

trying to hear a story. You should put yourself in the place of a reviewer looking at not only your proposal but 30 other proposals in similar areas. What story would you want to hear as a reviewer in order to make your proposal be in that 20% that are going to be successful? One of the things I always point out when we get questions is, what will reviewers think if, and you can fill in the blank, or will reviewers be concerned that -- fill in the blank. If you have asked that question, almost certainly reviewers are going to ask that very same question. So you should address your concerns head on and not just ask will reviewers be concerned. Because more than likely they will be, if you've asked that question. It is important to think like a reviewer and also that MRI like other grant programs is a competition so you need to find a way to say what makes your proposal stand out. Scientists are used to writing research papers, submitting them to refereed journals and getting comments back, addressing those comments, submitting the paper back for referee journal and many cases having that paper be accepted for publication. That is not what happens in grants program because it is a competition. There's only so many dollars to go around. You need to find a way to make your proposal one of the ones that stands out in that top 20%. So before we end, I'll ask whether or not my colleagues would like to chime. And see whether we have -- before we ask for questions. Okay. So we will now look at some of the on line questions. Of which there seem to be more than I thought there were. So give me a moment to try parse them out to my colleagues. I think those two are biomedical or related to that. While they're looking at those, I'll try one. Okay, go ahead.

>> So I have a question about use of the instrument in courses one of the things we routinely see in our proposals is to use the instruments in teaching. And that is considered a broader impact. And one of the things our panels see as a very positive thing is to somehow incorporate the instrument into class work. Be it demonstrations, be it research, projects that students may be involved with that actually will use the instrumentation. Be it projects where students will actually be exposed to the operations of the instrument. So yes, the incorporation of the instruments into classroom work is considered a very important major broader impact. And is one way in which students get really excited and jazzed up about science. So that is a very good thing.

>> Two questions on resubmissions. The first is asking if I have submitted a proposal before and graded well but did not get funded, and I submit it again this year, do I need to indicate it's been submitted before and been revised? The answer is no, you don't have to indicate that. It should basically be a new proposal. The second question is should I highlight my submission to places where I've satisfied the points made by the reviewers? And the answer is not necessarily because the review panel that looks at the proposal this time will probably not include reviewers from the previous year. You should think of this proposal in its entirety as an entirely new proposal, it should stand on its own merits and you should assume that the people who are reviewing it have not seen the previous version of the proposal. And it should have undergone substantial revision from the previous year.

>> I'll address a couple here. One on submission limits or partners. It says if four institutions partnered to one instrument which has hosted one institution, does a submitted proposal count against the proposal submitted by all four institutions, or does the submitted

proposal count against the proposal submitted only by the host institution? And here the simple answer we follow the money. So again, for acquisition proposal, the rules are slightly different for development proposals, and I won't go into that at the moment. But for acquisition proposals, if all of the money stays at the submitting institution and the other participants are unfunded, then it does not count against their submission limits. So it's only if dollars flow to an institution in acquisition proposal that it counts against their submission limits. Okay. This question is in 5 parts so I'll try address all 5 of them as best I can. It is I'm considering preparing to submit a MRI proposal. Some of the questions include does a MRI proposal require that multiple investigators or co PIs be involved. I mentioned early on that MRI is a shared instrumentation program. Whether they are listed as co PIs, which is very common on a MRI proposal, or otherwise listed as collaborators, the proposal needs to demonstrate a shared use in order to be competitive in the MRI program. Does the proposal include a time line in I should project when it should be up and running. Should be a one-year proposal-- as I mentioned MRI acquisition proposals may be for up to 3 years, even though the acquisition may be short-term, we do allow for operations and maintenance of instruments and that can extend again up to 3 years. That answers part of the one of the next questions. Service contract can also be requested for the duration of the MRI award which again for acquisition may be for up to 3 years again that justification has to be there in the proposal and the reviewers have to accept that. Can training courses for lab personnel be included in the budget? The answer is no, with the exception that a training of the person who is directly responsible for the operations and maintenance of the instrument is allowable, but not for training of the users. Just for the person who is directly responsible for the operations and maintenance. And can the request budget be for hiring a research technician for the first three years and that person can be subsequently covered by other means as will be indicated in the management plan. The MRI solicitation does talk about longer term institutional -- description of longer term institutional commitment to maintain the instrument. Research technician can be hired for the award duration and that again for acquisition can be for up to 3 years. But that has to be commensurate with the time that is needed in order to maintain that instrument and the education level that is required in order to -- for that person to do that work. So it may that be a bachelor's level person, it may be a master's level person. It may be a post-DOC, or dedicated research technician with other qualifications. But it may also be that person is not required 100% of the time to operate and maintain an instrument that may not be all that complicated. So it has to be within the scope of the requirements for that particular instrument.

>> I have a question from -- PIs from my institution submitted to MRI last year and were declined. Some reviewers had concerns that did not appear to be appropriate resources for the PIs to conduct the research for which the instrumentation was requested. As voluntary cost sharing is prohibited, how would an applicant address this issue of how the research will be supported? How much detail is needed? One of the things that is looked at by the panel when specific instruments are requested is whether or not the work can be conducted if funds are allocated for the instrument. So if you get the instrument, how will the research that will be done with the instrument be paid for? So a

lot of that information can be acquired by looking at the current and pending support to see if the PIs or the co PIs have current and pending support. Things that would be helpful to a reviewer and to the panel that could be included in such a proposal and in addition to that, would be things like does your university supply grants, research grants for faculty or for students, are funds available to support student research. So in that, the panelists need to have an idea that if the instrument is awarded, will you actually have the funds to enable the research to take place?

>> I have a question. Can computer equipment be included to satisfy the data management plan. And the simple answer is the guidance says that incremental costs are allowed. Have to think about that how that might apply to your particular data management plan and proposal.

>> Yeah, I'd like to do an addendum to that because the requirement for a data management plan, NSF has had a long-standing policy that the data that are obtained from research that it supports need to be available at incremental costs and I forgot the exact wording but in relatively short time frames to a broad community. MRI, again, as I point out provides for the acquisition and development of an instrument. So the newly implemented data management plan, which requires description of how that data policy will be implemented -- we do get questions about whether or not the data management plan is even required, because MRI doesn't actually fund the research. It funds the acquisition and development of an instrument but does not support the enabling research or education activities. But there is an option, as noted in the GPG, that says you have to have a data management plan or describe why one is not required. And I do not encourage anyone to put in a proposal that a data management plan is not required. Unless there's a really strong compelling case for that. However, what we look for in the MRI program, and again, various divisions have posted and it's available when you look in the GPG, where you can find the information I don't have it handy, various divisions, guidance on data management plans. But for MRI, what we ask people to consider is the fact that you are being given a piece of Major Research Instrumentation, that your researchers down the road are going to use in order to collect data. Possibly with NSF support. What we would like to see is a description of how the instrument will be configured, how it will be -- how it will enable those researchers to meet the data management plan requirements of NSF awards when they receive them. So for example, having standard meta data that will be available to researchers when they undertake their own research and can use that to satisfy the data management plan is one thing if there's a data, national data repository, for example, and you are able to maintain access to that for your instrumentation in a standardized way, if there's a need for a new hard drive that will be able to archive the data for X number of years off-site so if something happens in the lab, then your data aren't destroyed so that those researchers can provide the data. Those are the kind of things I think are very appropriate for MRI because you are the interface between the data and all of the researchers who are going to come. And what you can do to make sure that they are able to accomplish their needs is what we would look for in the data management plan.

>> The data management plan should be about data sharing.

>> Yes, indeed.

>> That's the important part. If you look in the PA P PG, in the description for line G-2. And think about this in terms of incremental cost. It says, this includes the following types of activities. And that

includes cleanup documentation storage and indexing of data and databases.

>> Leave it to our representative from the cyber infrastructure office to have a computer available with an Internet connection.

>> Can't live without them.

>> Indeed.

>> See if there's anything --

>> So here's a question. Must the organization commitment letter list previous awards in the last 5 years? Or provide progress updates? The slide apparently said list. I would have to go back into the solicitation and look, but the intent is that in the operations and maintenance commitment letter that the institution provides in an MRI proposal, the organization must describe the status of the last -- of all MRI awards made to the institution over the previous 5 years.

>> This is a question I am afraid I might have to get back to this specific question. How many proposals were funded for geo ocean science for FY 11 and what is the budget level for geo ocean science directorate for FY 12. The first one I would have to get back to you but I can address the more general question about the budgets of the various divisions. I mentioned MRI the expectation is we will have a budget of \$90 million and we're out of that setting aside \$35 million for the large proposals. That leaves, if I do my math correctly, \$55 million. That will be distributed to the divisions based on proposal pressure. When the proposals come, in I mentioned we had \$500 million in requests and certain fraction of those would be for the ocean science division. Whatever fraction that is, of the overall request, then the ocean sciences division would get that fraction of the MRI allocation. So that's the way that we apportion the money when it comes in. Every division is able to make award based on initial allegation of award of any size, and we've reserved the pool for the larger proposals to ensure that the -- all divisions are able to make large awards if in fact they are among the most meritorious for those various divisions. I'll just point out that for example some divisions at NSF don't receive many proposals. And in fact, therefore their allocation may not that be great. Out of the initial allocation. However, they may in fact get a proposal that is very large request, but they would not be able to cover it out of their initial allocation. So that's why we reserve this pot of money for the proposals that are greater than \$1 million.

>> Vicki: Can MRI be used to support projects in which there's both an applied -- which both a basic research component and a related biomedical issue. And the answer to that question is yes. Is that I've seen proposals come in where there's a basic research component and in the broader impacts they talk about biomedical disease related issues that can also be used, the instrument for later on. So the answer to that question is yes. It can be used to support both of those.

>> I often address questions like to by saying the preponderance of the research that's enabled and research training that's enabled should be a NSF supported fields of science and engineering and in fact we do have that criteria broader impacts and that certainly does apply. And those are related question here I probably can't answer the question directly. But we can get back to you. It's a question related to Ph.D. granting and NSF supported fields. Says would this include any fields that NSF supports or only at the institution? For example, if the institution has 20 Ph.D.s in psychology but does not have any going to the field of psychology, do those doctoral degrees in psychology

prohibits the institution from applying for MRI funding without the matching requirement. I will have to get back to you on some of the specifics here directly, but it is -- the criteria is the number of degrees in NSF supporting fields of science and engineering at the institution. So there are other programs where it's a little more tightly defined. But it is a requirement that the number of degrees have to be below or above a certain level based on the number of degrees awarded at that institution. So again I will get back to the specifics on this because I'm not exactly sure how to address the exact question that's being asked.

>> There's a question; is there a post doc research or mentoring plan needed for development proposal involving a technical researcher with a Ph.D, that he or she is not a post-DOC anymore? ' if you look in the PA P PG, there is a definition of categories of personnel they define a post-DOC, in there, it's an individual with a doctorate degree or equivalent, engaged in the temporary and defined period in advanced training to enhance professional skills and research independence needed to pursue his or her chosen career. And if you go down to a footnote on Page 2-9, it says in situations where a post-DOC, researcher is listed in section A, of the budget and is functional in a senior project personnel capacity, and defines as responsible for the scientific or technical direction of the project, a mentoring plan is not required. So I would advise to you read this very carefully. When you're thinking about whether you have to have a post-doc mentoring plan in the context of those definitions. They are both in the PA P PG

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>> I told you it, it doesn't roll off the tongue.

>> No.

>> A number of other questions and we have a little over 10 minutes. If you have any questions, please do send them in and we will attempt to address them in the remaining time that's available. So the question here is, if the MRI is proposing to develop a new instrument system, that is an instrument development, not acquisition of an instrument, will institutional commitments still be a important factor to review the proposal? The answer is yes. Again, as I mentioned, MRI proposals are considered to be institutional capacity building efforts. And even though the instrument is not being acquired at the end of the day, in a development proposal, there will be one certainly hopes, new instrument with new capabilities that will enable researchers on that campus or build the infrastructure at that campus to enable collaborations with other campuses. To undertake new cutting edge research that would not otherwise have been possible. So most certainly institutional commitment is required in both acquisition and for development proposals. So there are a couple of other questions. And one is related to whether or not -- basically -- the summary of the question is that an instrument is being deployed in the field. For example, a seismometer or an array of small radio telescopes or something akin to that. And the question becomes are there any concerns I need to be aware of in putting a instrument outside of the confines of a laboratory and the answer is yes. In particular in the last couple of years we've had several proposals that related to putting instruments in the field, for a certain year, desert regions that have been known to have inhabitants in the past. And there are things that are related to environmental and cultural sensitivity issues that need to be addressed. NSF is increasingly concerned with NEPA requirements, environmental protection act requirements. And cultural sensitivities. So if you have a proposal that is going to be deployed in the field, outside of the

confines of a lab, and needs to, for example, dig a trench or grade a surface or cut down a tree or be planted along a tree. Those are things we need to be aware of early on. So when you submit a proposal that has some environmental consideration, or cultural sensitivity, consideration. It would be useful for you to talk to the program officer even before it is submitted, so that they are aware such a proposal is coming, because the process to undertake, for example, an environmental assessment, can take an extremely long period of time and if it goes beyond a simple, if you will, environmental assessment, it may be a time frame that is too long for NSF to be making a award given appropriate funds given fiscal year. Please, if you have proposals that are like that, or you think might be like that, please make sure that you contact us in advance because that will help us to make sure your proposal is appropriately reviewed. We often get the question, too what is the earliest eligible start date on awards. Well, NSF has a stated goal of trying to make 70% of its award decisions within 6 months. And you can do that the math and take that out and that's the end of July, I believe, on the spot, maybe I can't do the math right on the spot. Toward the ends of July. So in the solicitation, I believe, it says the earliest request start date is August 1st. Some awards earlier, some later. We can't guarantee that a requested start date will be as you do request. But we do try and make all of our awards -- most of our awards by the ends of July and certainly all of the awards should be made, have to be made by the end of the fiscal year. Which is at the end of September. So anywhere in that time frame is relatively safe in terms of putting a start date. But there's no guarantee that what you -- the date you ask for can be accommodated. This one I'll actually talk about. And it may take me most of the remaining period of time. But if you have additional questions, please feel free to send them in. So this one is if our MRI proposal includes PIs funded normally from CMM I, one of our divisions in engineering, and DMR, another one in the mathematical physics division, then what is the best way to make sure that the proposal ends up in the right and qualified review panel? This is where again, I think I might take a little bit more time than I would otherwise like to. Please feel free to send in questions and we'll try accommodate them. As we mentioned, when you submit a proposal, you should select the primary unit that you think is appropriate for the review of the proposal. So in this case, it would be CMMI, the division in engineering. You may also select a division that you think also has relevance so. If there's a large fraction of materials research in it that you think is appropriate for the materials research division in MPS, as opposed to the engineering materials research, activities, then you may also select DMR for example, as the secondary unit. Since these two units were selected, I'll use them as my example. What that does, is when a proposal comes in to NSF, and again we send them to divisions based on the PI's preference, the program officers will look, both the first unit of consideration will flag that proposal, as being of interest to CM MI, and they will take a look at that time and see whether or not it is appropriate for their review and their division. But what it also does is it flags the DMR flag, also tells the program officer in DMR, that this proposal will not directly for them also has according to the PI, an interest in the materials research division. So the program officers will talk to each other, they actually do talk to each other, to decide whether or not for example the proposal is largely CMMI, and only has a little bit of DMR, interest. Or if it's a 50/50 mix or thereabout,

and what they can do, is then co review that proposal in two panels if in fact they feel that that's appropriate or if the DMR program officer feels it does have DMR interest but not enough to warrant being in a DMR panel, they can provide reviewers for the CM MI, program officer, to solicit and they'll ad hoc reviews. So that's the way that we can do it it can either be reviewed in panel, a be single panel, or multiple panels, or get ad hoc reviews from the various divisions. It may be that the DMR program officer says no, I don't think that the program specifically for DMR is appropriate for this proposal, and it may then be reviewed only in the CM MI, division at the discretion of the program officer. But again, another way that you can help us, is you have the option of submitting suggested reviewers, and suggested reviewers do not include, but within that option, and this list comes only to the program officers at NSF, it doesn't go out to the reviewers, you should provide as a list of suggested reviewers, real good reviewers without conflicts of interest, in both areas of CM MI, and DMR, here that might have expertise in the review. That way even if the CM I program officer does not get reviewers from DMR, they can have a list of DMR -related reviewers that may well be appropriate. I mentioned again that NSF has very strict conflict of interest rules and there's no guarantee that those reviewers can be used or would be used. But it is a way for you to provide some input into the disciplines that you feel are appropriate for the review of your particular proposal. So I'll let my colleagues chime in if they have any additional expertise because they're the ones who review in the panels and with the -- mail reviewers and may have additional insight.

>> I will just say providing that list of potential reviewers is critically important to the program officers to make sure that we get the proposal in the hands of the people that can best evaluate the work. And also quite frequently as Randy says, program officers do talk to each other and we co fund a lot of the proposals and we did that quite frequently last go-around in biology. So that's a way to get a lot more proposals funded, if we co fund.

>> That's a very good point about the co funding.

>> And it's not uncommon for cyber infrastructure proposals to go to other directorates at NSF. So we look out for those, if you identify OC Is at least a secondary, then it makes an easier to find them. I'd be happy to provide names of reviewers or if you want to suggest names of reviewers, please do so.

>> That's a very good point. The more you can do to help us find the right reviewers for your proposal, the better off everybody will be. At that point. And we have a couple of minutes, I believe. And one more question coming in. And I will just -- there's a question here, how exactly do I calculate cost sharing of 30%. And I want to mention again that it's the total project cost. So the simple example is if the proposal comes in, if you've defined the scope of your project over the next two to three to five years, whatever it happens to be, and you feel that at the end of the day, you're going to spend a million dollars to do this particular project, and you are required to cost share, then you can request only \$700,000 from NSF, and other \$300,000 must be provided as cost sharing. And I will mention that cost sharing must come from nonfederal sources. And it may -- it's also possible for cost sharing to come from third party sources. But the institution that is submitting the proposal is required to document on line M of the proposal, the required 30% cost sharing, that cost sharing is coming from other participants in the project, example through sub awards. Or

if in fact there's a third party source that's providing the cost sharing, the institution is responsible for ensuring that the cost sharing is met. So the institution's proposal must have the cost sharing amount on it.

>> We had a slew of questions at the very end, and I'm afraid we're not going to get to all of them but we will try to get to -- I'm not sure what that is so I'll come back to that. How does one fund a collection of instruments to outfit a laboratory. Are there other programs that support this? A 70,000 instrument breaks the glass ceiling budget level of typical NSF proposals. The answer is I'm not aware of any other programs that fund a suite of instruments that outfit a laboratory. For non-Ph.D. granting institution, the lower limit of \$100,000 does not apply or in certain areas, that is mathematics and social behavioral and economic sciences. But a \$70,000 instrument there may be a valley of death in the other direction, perhaps, where it's hard to fund those kind of instruments. But I'm not aware of any other instrumentation programs specifically, although I do point out again that at the back of the MRI solicitation there's a list of other instrumentation programs. But you may otherwise have to talk to the program specifically where the research would be funded. Okay, on that note, I think we've reached our allotted time. I'll thank you again for signing in to the webcast and again the questions that came in toward the end, we will address in the next several days unless they are duplicated by answers we've already provided. If you don't feel that you've received a response to your e-mail, to your question, please send a question -- the question directly to our office and we'll try to get to that. MRI@nsf.gov. Again, thank you very much and I look forward to seeing many proposals in January.