

## **Report of the Subcommittee of the MPSAC to Examine the Question of Renaming the Division of Mathematical Sciences**

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### **Background**

Dr. Sastry Pantula, Director of the NSF Division of Mathematical Sciences, has proposed that the Division be renamed the Division of Mathematical and Statistical Sciences. In a letter to Dr. James Berger, chair of the MPSAC, the MPS Assistant Director Ed Seidel asked Dr. Berger to form a subcommittee to examine the question of renaming the Division of Mathematical Sciences at NSF. It included the following charge to the subcommittee:

### **Charge**

The subcommittee will develop the arguments, both in favor of, and against, the suggestion of renaming the Division of Mathematical Sciences.

In doing so, the scope of the subcommittee will include the following:

- Seeking input from the mathematical and statistical societies within the U.S;
- Seeking input from individual members of the community on this matter; and
- Developing a document listing the arguments in favor of, and against, the suggestion.
- And other comments relevant to this topic.

In order to accept input from the public, MPS will arrange for creation of a website or email address to which the community may send its comments. Comments may be unsigned. While the subcommittee is not required to announce its meetings and hold them open to the public because it will be reporting directly to the MPSAC, any documents received by or created by the subcommittee may be subject to access by the public. The subcommittee should deliver its final report and present a summary of this report for consideration of acceptance by the MPSAC at its meeting in April 2012.

### **Process for Obtaining Input**

Before we became an official subcommittee, most of our members, acting informally, discussed the need to get feedback from the community about the proposed name change. We discussed this with Dr. Pantula and asked him to provide a letter we might use to gather comments from the community. We wrote to the presidents of professional societies, requesting their input, and

including a letter from Dr. Pantula, dated October 6, 2011, that gave his rationale for the name change. That letter is included as an Appendix. The request asked the societies to present summaries of comments received and any individual comments the societies wanted to pass on in an appropriately de-identified way. We also sought input from the directors of the mathematical sciences research institutes. Because the societies were giving the issue wide publicity and because they had a much better way to reach the entire community than we did, we left it to the societies to gather comments and to let individuals know that they could respond directly. When we became an official subcommittee, we again wrote to the presidents of professional societies and to directors of the mathematical sciences research institutes, reminding them of the earlier correspondence and informing them that we were now an official subcommittee of the MPSAC. In preparing this report, the subcommittee utilized an email address [dmsname@nsf.gov](mailto:dmsname@nsf.gov) for formal feedback from the community, and we informed the presidents and institute directors of this email address at the same time that we informed them of our official role.

In addition to comments from the community, we also received reports of public forums in which the community could give feedback and assisted in arranging some of these, both informally as interested members of the MPSAC and later in our official committee role. Prior to our appointment as a subcommittee, there was dialogue about the name change issue at the meetings of the Board on Mathematical Sciences and their Applications BMSA (Oct. 21), and of the Joint Policy Board for Mathematics JPBM (Oct. 31). We received summaries of the discussions as these sessions. Subsequent to that time there were dialogues at the SIAM Science Policy Committee (Dec. 5) and the Joint Math Meetings (JMM) (Jan. 7).

Formal comments were received at the official subcommittee email address from the following professional societies:

American Mathematical Society (AMS)  
American Statistical Association (ASA)  
Institute of Mathematical Statistics (IMS)  
Institute for Operations Research and Management Sciences (INFORMS)  
Mathematical Association of America (MAA)  
National Association of Mathematicians (NAM)  
Society for Industrial and Applied Mathematics (SIAM)

We also received additional formal comments as follows:

1. Open letter from 41 members of the National Academy of Sciences (transmitted by George Andrews) (one signee added later)
2. Anonymous letter from “A Concerned Mathematician”
3. Letter from Professors Peter Bickel (U.C. Berkeley), Iain Johnstone (Stanford University), and Tom Kurtz (U. of Wisconsin)
4. Email from Professor Stephen Fienberg (Carnegie-Mellon University)
5. Email from Professor Michael Perlman (University of Washington)
6. Letter from Professors Peter March (Ohio State University), William Rundell (Texas A&M), Phillippe Tondeur (U. of Illinois) (former DMS Directors)

7. Email from DMS Director Sastry Pantula dated December 16, 2011
8. Email from DMS Director Sastry Pantula dated January 9, 2012

Members of the subcommittee also attended public sessions of professional society meetings and committees where the name change was discussed and this report's summary includes some of the ideas suggested there.

### ***Summary of Comments Received***

Some of the communications we received from professional societies included hundreds of individual comments, all of which we read in preparing this report.

The professional society responses clearly reflected the strong feelings of the community about the name change issue and included sometimes harshly worded responses in the hundreds of individual comments that the societies passed along with their summaries. The AMS took an official position against the name change, and all but 13 of the 342 responses it received from its members were opposed to it. The ASA supported the name change. Other societies chose to report arguments for and against. MAA reported that about 80% of the members who responded were opposed. SIAM reported that a vast majority of its respondents were opposed: 142 against, 14 for, 12 with no clear opinion. IMS reported a "divergence" of opinion, with a majority of its respondents (40 out of 57) being favorable. IMS attributes this divergence to the lack of homogeneity of its members' representation in mathematics and statistics. INFORMS received no comments. NAM only reported the opinions of its Board of Directors, and did not give percentages in favor or opposed, but recommended more discussion and exploration before the name change is made.

A letter from 41 members of the National Academy of Sciences expressed strong opposition to the name change. They said

*"We write to express our concern and dismay at the possibility that the name of the Division of Mathematical Sciences of the National Science Foundation might change in order to highlight Statistics. We feel strongly that to change the name of DMS (for example, to the Division of Mathematics and Statistics or to the Division of Mathematical and Statistical Sciences) would be harmful to all of the mathematical sciences, including Statistics. Although there has been no open discussion of a change of funding priorities of DMS, we are concerned that the proposal for a name change is part of a plan to modify the mission of DMS within the NSF."*

The letter from three former Directors of DMS (Drs. March, Rundell, and Tondeur) expressed serious concern. Here are some excerpts from that letter:

*"We write to express our concern regarding the proposal to change the name of the Division of Mathematical Sciences (DMS) to the Division of Mathematical and Statistical Sciences.*

*"While we believe the name change is intended as a sign of inclusiveness, we are concerned that it will have precisely the opposite effect. The current name of DMS is inclusive of Mathematics and Statistics and much else, while the proposed name violates common usage*

*and creates unhelpful separations and exclusions. Mathematical Sciences is not only the name of an NSF Division but also a widely accepted term that represents a diverse research community. We are convinced the proposed name change will excite negative modes in this community, threatening to undo decades of patient and, we believe, successful advocacy for an inclusive view of the mathematical sciences.*

*“In its stewardship of the Mathematical Sciences, DMS has invested in basic research and workforce development in Mathematics, Statistics, Computational Science, Operations Research and an ever expanding range of interdisciplinary partnerships at the frontiers of science and engineering. This approach has led to significant budget increases during our tenure at NSF. The Division will continue to thrive if it funds high quality research in the mathematical sciences and maintains an inclusive view of its role in the ever expanding science enterprise.”*

We received two emails from statisticians, one for and one against, and an anonymous letter from a mathematician opposing the name change. We also received an email from DMS Director Sastry Pantula, dated December 16, 2011, providing points for us to consider, and another dated January 9, 2012, forwarding the comments he made to the Joint Mathematics Meetings in Boston on January 7, 2012, in which he summarized his arguments in favor of the name change.

We have received the clear message that the strong feelings expressed by the community and the dialogue that has ensued point out that there are serious issues about the role of statistics in NSF that go well beyond the name change and should be addressed no matter what the decision about the name change turns out to be. We received a letter from three prominent statisticians that addressed this question and recommended “a study directed at assessing the current structure of support for the statistical sciences and even more broadly the mathematical and statistical sciences within NSF and perhaps broadly again within the government agencies.” We return to this comment below.

Based on the comments received, we can summarize the arguments for and against the name change as follows.

### ***Arguments for the Name Change***

- 1). The name change is responsive to the NSF Strategic Plan, which emphasizes the importance of interaction and partnership with stakeholder communities. Statisticians form a stakeholder community that is significantly separate from that of mathematicians – there are separate departments, separate societies, etc. The proposed name change would be an overdue recognition that statistics is its own discipline - not a mathematical discipline, but one that uses mathematics.
- 2). Currently, the primary mention of statistics at the NSF web site is only in the sense of summary indices describing science and engineering graduates, workforce, budgets, etc.
- 3). An explicit and inclusive name helps recognize statistical sciences without taking anything away from various areas mathematics.

4). The statistical sciences need or would benefit from greater visibility in the scientific community. An inclusive name not only recognizes the distinct disciplines and the sister organizations, but also helps students— addressing a current and likely future significant shortage of statisticians - and junior faculty to find a more welcoming place at NSF.

5). In the era of big data, it is crucial that the potential contributions of the statistical sciences be acknowledged. The presence of the term “statistical sciences” in the Division name would signal the intent of the Division to be a significant contributor to advancing research in big data. Explicitly including statistical sciences in the Division's title would place the Division in a better position for new funding in this area rather than most such funding going to computational sciences and CISE.

6). The name change will show that the Division welcomes grant applications from statisticians, whereas the current name does not make that clear.

7). The importance of statistics has exploded in disciplines such as finance, economics, medicine, public health and political science, and the name change could enhance collaborations with those disciplines. Similarly, the name change could enhance collaborations between various directorates at NSF, e.g. between MPS and BIO. Moreover, statistics is central to many of today’s complex research challenges. Thus, the name change could help grow resources for the statistical community by helping DMS build bridges to other areas. This could encourage cross-disciplinary funding so that overall research funding for the mathematical sciences is not reduced.

8). Many fields use (and sometimes create new) mathematics – e.g., physics and computer science, and to a lesser extent biology, economics, chemistry, and engineering. All of these disciplines that use/create mathematics have distinct identities at NSF except statistics.

9). The name change will make it easier to recruit good program officers in statistics to DMS.

10). The name change would not in any way reflect a move by DMS to relax its focus on basic research. DMS already supports many statistical research projects that are a mix of basic and “mission-oriented” research. The argument that an emphasis on statistics implies a lesser emphasis on basic research and a greater emphasis on mission-oriented research is flawed since almost any subfield of statistics has a basic research component.

### *Arguments Against the Name Change*

1). The current name “Division of Mathematical Sciences” was chosen to be inclusive, to emphasize the breadth and integrated nature of programs supported by DMS. The name change threatens extensive efforts to achieve this inclusivity to the benefit of all and would be divisive. Moreover the current name also reflects current usage in the mathematical and statistical literature.

2). The name change suggests preferential treatment for one subfield in DMS. The situation of statistics does not differ significantly from that of other subfields of the mathematical sciences,

e.g., computational science, operations research, or mathematical biology. Other subfields would seem to have an equally strong claim to be explicitly mentioned in an expanded name. The current name covers those areas of the statistical sciences that are appropriate to fund.

3). Statistics constitutes a small (although significant) proportion of the DMS portfolio in terms of number of programs, number of grant applications, number of grants funded.

4). If the goal of the proposed name change is to attract more resources to the Division, this is not at all clearly attainable, especially in the current budget climate. If the name change attracts more proposals to the Division from the statistics community, this could draw funding away from other subfields and it could also increase the workload of the Division's program officers.

5). Statistics is funded throughout the federal government. The traditional funding of statistics by DMS is appropriate: fund fundamental research in statistics. Broadening the mission of DMS to include more applied statistics would not benefit the overall funding of the mathematical sciences.

6). If the name change signifies a change of funding focus for the Division, this should only be undertaken with broad-range input from the mathematical sciences community. The name change could result in an erosion of funding for basic research in the mathematical sciences, the traditional target of DMS.

7). If the current funding of statistics and/or the current statistics programs at DMS are inadequate, this should be addressed substantively, not by changing labels.

8). Important issues facing the nation such as large-scale data analysis benefit from research by the statistics community, but contributions from statistics are greatly enhanced by collaborative efforts with other mathematical sciences and emphasizing the different nature of statistics could only impede this collaboration.

9). The case for a name change has not been adequately made by NSF. The community expects more evidence of a problem and more discussion of possible consequences before such a potentially divisive proposal is made or acted upon.

### *Next Steps*

The issues raised by the name change dialogue go well beyond the name change itself. Indeed, many of the responses we received addressed the question of what to do after the decision about the name change is made. Many also addressed the process by which the name change arose and are highly relevant to the planning of any next steps. In particular, there were two primary themes concerning process:

- *Community involvement at the beginning is crucial.* We received a number of comments to the effect that the process of proposing the name change did not have sufficient initial community involvement. Comments suggested that, in going forward, the process of developing next steps should be carefully thought out, the relevant communities should

be involved at the beginning and it is important that the process be transparent to all involved.

- *Tensions in the community need to be alleviated.* We heard from many that discussions of the name change have highlighted and exacerbated tensions in the community. Comments suggested that steps should be taken to help alleviate these tensions, and that NSF leadership is clearly needed.

The one suggestion we received in regards to the latter theme was to use the arguments surrounding the name change to motivate an undertaking to effectively define Mathematical Sciences so as to highlight and promote the strengths and versatility of this group of disciplines, a group that includes the community of statistical scientists. Interestingly, such a program is currently being undertaken by the ‘Mathematical Sciences in 2025’ committee of the National Academy of Sciences, at the behest of DMS.

The other responses we received suggesting specific next steps primarily focused on the issue of the proper positioning of statistics and big-data at NSF. (A few responses also mentioned the issue of proper positioning of Computational Science and Engineering (CSE) and are included below.) These responses addressed one or both of the following points.

1. Statistics is a separate discipline from mathematics.
2. Dealing with the scientific opportunities and challenges of big-data is crucial for the mission of NSF, and doing this well poses serious challenges to NSF.

First we summarize the discussion of these two points, and then turn to possible next steps.

While many of the responses focusing on the name change were concerned with the semantic question of whether or not statistics is a mathematical science, the statisticians we heard from made it clear that the statistical community overwhelmingly views statistics as a separate discipline from mathematics. The points made in this regard included the following.

- There are nearly 100 independent statistics departments at research universities and statistics produces over 1/3 of all the Ph.D.’s in the mathematical and statistical sciences. Furthermore, the ratio of faculty in statistics departments to faculty in mathematics departments in the universities with older statistics departments ranges from 50% to 75%.
- While statistics has a mathematical theoretical underpinning, the heart of the subject lies in its interfaces to the real world, which are conceptual in nature and require statistical modeling and inductive statistical thinking.
- Many other sciences view statistics as a separate discipline and have indeed created subdisciplines at the interface of their discipline and statistics (e.g., biometrics, psychometrics, econometrics, ...)
- There is a Chief Statistician of the United States and there are 14 statistical agencies of the federal government. K-12 common core standards include statistics and statistical literacy and the number of students annually taking the statistics AP exam has grown to over 100,000. The ASA has a 175 year history and 18,500 members.
- One responder mentioned that, of the last 20 COPSS Award winners (the statistical counterparts of the Fields medalists), only one of them did work that might have been

tenurable in a math department while, of the last 20 Fields medalists, probably only one did work that might have won tenure in a statistics department.

- Another observed that statistics is enriched by mathematics, in the same way that physics, computer science, astronomy, and other fields are advantaged, and this is a heritage to be treasured. But, over time, disciplines diverge; indeed, mathematics, medicine and music were once all part of philosophy. More recently, operations research and computer science separated themselves from mathematics.

There were some in the community who questioned whether this separation of statistics and mathematics as disciplines is desirable, but it seems clear that it has happened.

The big-data challenge was viewed by many as a primary motivation for ‘next steps’ at NSF. Several variants of the motivation were presented.

- With big-data providing wonderful opportunities but also severe challenges for science, the need for statistical research, in its own right and as a part of overall scientific activity, has never been stronger. Numerous comments observed that this applies also to other programs in DMS, with various branches of mathematics currently and potentially being crucial players in big-data. Indeed, it is clear that all divisions within MPS could potentially play a large role in big-data.
- Because of the increasing demands from big-data, statistical science itself is changing rapidly, with massive changes in the focus of research and heavy involvement in completely new cross-disciplinary ventures.
- There is worry that big-data is primarily being approached from the perspective of handling and sharing the data whereas, at least as crucial, is development of theory, methodology, and algorithms for appropriately drawing conclusions from data.

With these motivations as background, the current situation of statistics at NSF was described as follows. (There were not specific comments addressing the current situation of big-data, but see the MPSAC report on Data-Enabled Science for discussion of that situation.)

- Statistics is currently represented by one program within DMS (with about 1/10 of the DMS portfolio), a smaller program in SBE, and scattered support elsewhere; this support was viewed by statisticians as not adequate for a vigorous discipline.
- The current situation leaves almost no flexibility to respond to the massive changes happening in statistical research caused by big-data, and leaves statistics ill-positioned to respond to the needs of science involving big-data.
- Several respondents mentioned that important subareas of statistics can “fall through the cracks” because of the current positioning of statistics within NSF.
- The current structure was viewed by some as potentially harmful to the non-data oriented areas of mathematics if big-data initiatives cause funds to be diverted from these areas within DMS; if statistics were on its own, this tension might be lessened.
- A similar confluence of factors happened earlier with computer science, and eventually led NSF to the formation of a separate directorate for CS. (We did receive one comment criticizing the NSF decision to form an entire directorate of CS, noting that CS is only one department in many universities.)

Those that recommended next steps, invariably focused on reorganization of statistical and big-data research within NSF. Specific suggestions were as follows.



- Make statistics a division, reflecting its status as a separate discipline and allowing it to react properly to the massive changes occurring in statistics and science because of big-data. This was suggested by numerous people, observing that this is an obvious way to allow statistics to reach its natural scientific equilibrium.
- Make OCI the home of statistics and big-data, recognizing the inherent interdisciplinary nature of statistics and of the major big-data issues.
- Combine the various statistics programs in NSF with operations research, machine learning, and various ‘informatics’ programs to create a Directorate of Informatics and Statistics.
- Create a Directorate of Mathematical Sciences, consisting of divisions of applied and computational mathematics, pure mathematics, statistics, and computer science. If not that, find another way to give Computational Science and Engineering a home. (This respondent viewed the current treatment of CSE at NSF as the main problem and several others mentioned that the CSE problem at NSF was comparable to the statistics problem.)

There were several comments to the effect that separation of mathematics and statistics is not desirable, either reflecting a view that sound statistics requires mathematics or that there are significant synergies in being together.

If next steps are taken, then the process should be open and meaningful, and not simply another shelved study. Indeed, it was noted that there were two earlier reports on these issues (that arose out of NSF workshops) that pointed out the basic challenges and suggested possible ways forward:

- “A Report on the Future of Statistics,” *Statistical Science*, **19**, 387-413 (2004).
- The report “Discovery in Complex or Massive Datasets: Common Statistical Themes” at [www.nsf.gov/mps/dms/documents/DiscoveryInComplexOrMassiveDatasets.pdf](http://www.nsf.gov/mps/dms/documents/DiscoveryInComplexOrMassiveDatasets.pdf)

Of course, inevitably one must begin with a study of the situation, and in this regard we received the following useful and very specific suggestion from Professors Bickel, Johnstone, and Kurtz:

*“... we recommend consideration of a study directed at assessing the current structure of support for the statistical sciences and even more broadly the mathematical and statistical sciences within NSF and perhaps broadly again within the government agencies. We believe that a major issue that needs to be considered is the classical big science vs. little science dichotomy. To a very considerable extent statistics and applied mathematics and parts of pure mathematics have become ‘group’ science requiring bodies of graduate students, postdocs and computing resources. Parts of the disciplines have fruitfully remained, small science, focusing on the individual investigator. NSF is charged with fostering fundamental research, which, of course, covers both modes of operation. We strongly suspect that an assessment in the light of these questions would identify a more effective organizational structure that would take into account the new forms that the mathematical and statistical sciences are assuming and better relate developments in these sciences to developments in areas of application while maintaining the integrity of the ‘small science’ core.*

*While we would be happy to provide further thoughts on how such a study might be organized, for the moment we only emphasize a few aspects that we hope would be part of the effort. First, we think that it is important to ask the community to identify research directions that do not fit well in the current structure. The focus here should not be good*

*proposals that failed to receive support simply because there is insufficient funding, but good ideas that may not even make it to the proposal stage because they have no natural home within NSF or the Federal research organization more broadly. Such information would be a natural place to begin in identifying deficiencies in the current organization. It might be best to first ask ASA and IMS and, if they express an interest in a broader study, AMS and SIAM to address this concern. Second, in the light of the first step, we would urge a review of the organization of support for statistical sciences and (if they express an interest, mathematical sciences) research within NSF. Clearly, this support is not confined to DMS, and other divisions and directorates should be involved. Finally, we believe that the professional organizations that represent current DMS stake holders should have a role in the study even if they do not see the need for direct participation. In part, this involvement should be aimed at reestablishing the trust among these organizations that seems to have been lost amidst the current controversy, but we also believe that other communities among DMS stake holders will see issues similar to those identified by the statistics community. The relationship of the statistical sciences to the other DMS communities should be an important consideration in any restructuring that might take place.”*

## Appendix : Letter from Dr. Sastry Pantula Explaining Rationale for the Name Change

October 6, 2011

Dr. Fred Roberts  
Convener, MPS AC Math/Stat Subgroup

Dear Fred,

I am writing to inform you regarding a proposal to change the name of our Division. My decision to seek a name change is the result of discussions on how best to position the Division for the future, in light of the very clearly established trends toward scientific discovery increasingly dependent on the collection and interpretation of (massive) data and quantitative information. Query a layperson (or a policymaker) as to the academic disciplines most relevant to the Age of Information and the likely responses are Computer Science, Mathematics, and Statistics. DMS is an important source of funding for two of these three disciplines yet the current name manifests only one. The proposed new name of the Division,

### **Division of Mathematical and Statistical Sciences (MSS)**

recognizes explicitly the two major disciplines served by the Division. Including both disciplines in the name would allow the Division to effectively leverage the combined resources and support of two very large communities, thus putting the Division in a better position to vie for future resources and be inclusive of the growing statistics community.

The Division hopes to get feedback from your group on the proposed name change, as well as any feedback that your group gathers from the mathematical and statistical communities. Following is some background information that you and the community may find useful. Please do not hesitate to contact me if more is desired.

### **Big Data:**

Big data provide big opportunities for mathematical and statistical sciences. It is an exciting time for our Division. In his FY12 budget roll-out speech NSF Director Dr. Subra Suresh referred to the "era of data and observation." The NSF 2011-2016 Strategic Plan notes that "The revolution in information and communication technologies is another major factor influencing the conduct of 21st century research. New cyber tools for collecting, analyzing, communicating, and storing information are transforming the conduct of research and learning. One aspect of the information technology revolution is the 'DATA DELUGE,' shorthand for the emergence of massive amounts of data and the changing capacity of scientists and engineers to maintain and analyze it." Extracting useful knowledge from the deluge of data is critical to the scientific successes of the future. Data-intensive research will drive many of the major scientific breakthroughs in the coming decades. There is a long-term need for research and workforce development in computational and data-enabled sciences. Statistics is broadly recognized as

a data-centric discipline, thus having it in the Division's name as proposed would be advantageous whenever "Big Data" and data-sciences investments are discussed internally and externally.

I want to emphasize that the primary objective of the name change is to build a broader base from which to attract new funds. We expect the new resources to benefit all core programs, and do not envision reducing funding for core areas of mathematics and statistics. The latter are essential and the investment in fundamental research in core disciplines continues to be a priority. Computational and Data-Enabled Science and Engineering research and other initiatives provide more opportunities for mathematicians and statisticians to collaborate as co-investigators in tackling new challenges.

**A Bigger Community:**

The spectrum of statistical sciences is highly varied, especially in light of its connections to areas such as biostatistics, various informatics, analytics, data mining, industrial statistics, federal statistics, survey methodology, applied statistics, and research methodology more generally, that are supported by NSF within and outside of our Division. The progression and the culture of statistics do not justify its being viewed as one of the mathematical sciences; there is common ground between the communities but it is their differences that make their union so compelling and formidable when positioning for funding in a data-centric environment. Statistical sciences are inherently multidisciplinary and proposed explicit inclusion of "statistical sciences" in the name of our Division will also facilitate collaborations among other divisions at NSF.

In summary, the proposed new name would put our Division in a much better position to vie for new resources in this era of big data. It emphasizes the union of two large but different communities. The proposed new name would help increase resources for ALL core programs, keep the communities united, and thus is a win-win for both communities. I want to emphasize again that, as the Division Director, my goal is to enhance the resources to our Division and ensure that any new resources benefit all of our programs.

Finally, the proposed name change would make the Division better able to attract new resources in areas such as sustainability, energy, massive and complex data, economic development, health, environment and security, and provide new opportunities for collaborations among mathematicians and statisticians, and with other domain sciences and engineering. Such collaborations and unity of the two communities would be important for the future discoveries and for future resources for innovation.

I look forward to feedback on the proposal from your group, including any other input you might gather.

Sincerely,



Sastry G. Pantula, Division Director, DMS/NSF