

## **Preliminary Findings of the INFORMS Ad Hoc Committee on Diversity**

### **Committee Members:**

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### **The Charge to the Committee**

First, the committee would like to thank the INFORMS President, Professor Mark S. Daskin of Northwestern University, for establishing this Ad Hoc Committee in late July 2006 in order to assess, according to the charge put before the committee, "whether or not there is any sort of problem with diversity within INFORMS." According to President Daskin, "diversity means involvement of both men and women, young professionals and more senior colleagues, as well as individuals of different racial, ethnic and national backgrounds in all INFORMS activities. INFORMS activities include INFORMS-level activities (the Board), publications, and national meetings as well as community-based (subdivision-based) activities." President Daskin appointed the committee because of a sense that he and others have that the INFORMS leadership may not adequately reflect the diversity of the INFORMS membership. Included in the committee's charge is that, should the committee find that diversity is an issue that INFORMS needs to address, then the committee should try to identify ways in which "we can increase the representation and involvement of any groups that are not adequately engaged in INFORMS activities."

Communications with such professional societies as the American Physical Society, the American Chemical Society, and the IEEE informed the Chair of the committee that no such similar intra-organizational examination had been conducted within these societies.

### **The State of the Union and Other Recent Reports and Findings**

Various data/statistics are compiled by the National Science Foundation regarding Women, Minorities and Persons with Disabilities in Science and Engineering and can be found at: <http://www.nsf.gov> In particular, a special report has now been released by NSF "US Doctorates in the 20<sup>th</sup> Century;" see: <http://www.nsf.gov/statistics/nsf06319/> In addition, NSF reports data on doctorates obtained from US institutions; see: <http://www.nsf.gov/statistics/doctorates/>

The "Nelson Report," compiled by Dr. Donna J. Nelson, and revised on January 6, 2005, provides a national analysis of diversity in science and engineering faculties at research universities. The report is available at:  
<http://cheminfo.ou.edu/~djn/djn.html>

Some of the key findings of the Nelson Report are that there are few tenured and tenure-track women faculty in the top 50 departments of science and engineering in research universities and that minorities are significantly underrepresented.

In the past two years, very likely due to the discussions that followed after what has come to be known as the "Summers hypothesis" (Dr. Larry Summers is the immediate past President of Harvard University) there has been a resurgent focus on the examination of a variety of institutions as to their participation/representation of women and underrepresented groups.

The report, "Women for Science: An Advisory Report," written by a panel co-chaired by Johanna Levelt Sengers and Manju Sharma was issued by the InterAcademy Council in June, 2006. The report was the result of a lengthy investigative and approval process, and is available at <http://www.interacademycouncil.net> (and was cited and discussed in the June 20, 2006 issue of *Science*). The report was commissioned by the Board of the InterAcademy Council, and which consists of 15 male leaders of national academies. The report severely criticizes national academies since they are much less balanced than the demographics of a field would suggest. Moreover, it emphasizes and documents the need for more women to be represented in the highest positions of the scientific enterprise in terms of positions of leadership. The report is a recommendation for action and, as noted in the September-October 2006 newsletter of the Association for Women in Mathematics by the President of AWM, Dr. Barbara Kreyfetz, a call to action. The authors express what must have been a rather frustrating discovery (as this committee also discovered) that many institutions simply do not maintain data on the participation rates of women. A conclusion of the Sengers-Sharma report is that the authors make a strong plea for collecting gender-disaggregated data.

The National Academy of Sciences convened a panel, consisting of 17 females and one male and issued a report, "Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering," and chaired by Dr. Donna E. Shalala. The panel that reviewed the report at the National Academy of Sciences consisted of ten males. This report is available at: <http://www.nationalacademies.org> This report was overviewed in a *NYTimes* article that appeared on September 18, 2006 and which is available at:  
<http://www.nytimes.com/2006/09/19/science/19women.html?ex=1316318400&en=65e8697536b7cdac&ei=5088&partner=rssnyt&emc=rss>

In addition, the *Chronicle of Higher Education* recently devoted an entire section, entitled, Diversity - Section B, in its September 29, 2006 issue; see:  
<http://chronicle.com/indepth/diversity/> In particular, therein, there is an article, "A Look at Minority and Female Doctorate Recipients."

Another relevant article is "Careers in Science: More Women in Science," by Handelsman et al., August 19, 2005, which appeared in *Science*; data upon which this article is based, along with relevant supplementary readings can be found at: <http://www.sciencemag.org/cgi/data/309/5738/1190/DC1/1> This article was co-authored by 11 female leaders in science, including Dr. Donna Shalala, President of the University of Miami, Dean Barbara Grosz of the Radcliffe Institute for Advanced Study at Harvard University, and Dr. Cora Marrett of the University of Wisconsin.

### **Additional Background and Initial Data-Gathering**

INFORMS was established in 1995 as the merger between ORSA (Operations Research Society of America) and TIMS (The Institute of Management Sciences). ORSA had been established in 1952 and TIMS in 1953. Background on INFORMS, its governance structure, as well as its origins and the history of ORSA and TIMS can be found on the INFORMS site: <http://www.informs.org>

In order to scope out the data availability, in early August, 2006, the Chair of the Ad Hoc Committee, Dr. Anna Nagurney, emailed the INFORMS office in order to try to obtain data for 1995-1999 and 2000-2004, regarding:

1. INFORMS membership (in terms of age distribution, male/female distribution, representation by underrepresented groups, US citizen/permanent resident/non US) and breakdown of these data by section/society, etc.
2. Officers and Board of Directors (same data)
3. Editors/Editorial Board Members (same data)
4. Division/Subdivision (same data)
5. Committee Chairs (same data)
6. Any demographic data on Annual Meeting Attendees, Organizers, etc.
7. Any demographic data on potential INFORMS members to see whether INFORMS is attracting a diverse and representative group
8. Any demographic data from INFORMS publications, such as data presented to advertisers in ORMS Today as to readership.

Ms. Mary Magrogan of INFORMS informed the chair that INFORMS does not track easily any of the detailed data requested and, in particular, male/female composition or race, although INFORMS does track graduation date and highest degree earned of its members. See <http://supernet.som.umass.edu/informs-diversity/qryJJCountHighDegrees.xls> for data on highest degree earned for INFORMS members (numbering 10,797 members) with data provided by Ms. Betsy Fruhling and Ms. Ann Fishkin of INFORMS.

In addition, Mr. Barry List of INFORMS provided an INFORMS membership satisfaction survey report prepared by International Communications Research (ICR) in April 2006. From this presentation, based on an email survey conducted February

2- March 4, 2006 by ICR of 10,649 INFORMS members with 511 responses obtained we are able to infer the following regarding membership: approximately 76% is male and approximately 23% is female, with 4% being under age 25; 36% being in the age group 25 to 34; 25% being in the age group 35 to 44; 17% being in the age group 45 to 54; 14% being in the age group 55 to 64, and 4% being 65 or older. 51% of the respondents to the survey had said that they had earned a doctoral degree. 33% identified themselves as being professors and 12% as students. It is worth noting that the respondents to this survey represented a higher percentage of PhD holders than that provided by INFORMS; see link immediately above.

Dr. Robin Lougee-Heimer of IBM, a member of WORMS (Women in Operations Research and Management Science), graciously provided the committee with a presentation she delivered at an INFORMS National Meeting, which captures the pipeline in the profession with a focus on industry in 2000; see: <http://supernet.som.umass.edu/informs-diversity/pipeline.ppt>

Dr. Lougee-Heimer also provided the committee with extensive notes taken as part of her research on the issue, compiled in 2000; see: <http://supernet.som.umass.edu/informs-diversity/Filling%20the%20Pipeline.doc>

Finally, it is important to note the INFORMS FORA with direct bearing on INFORMS members in terms of women and diversity and these are: WORMS (mentioned above); see: <http://worms.forum.informs.org> and the Minority Issues Forum; see: <http://minority-issues.forum.informs.org> These sites contain additional useful links to associated documents and other relevant sites. In particular, we note the Mathematicians of the African Diaspora (MAD) web-site; see: <http://www.math.buffalo.edu/mad/>

## **Additional Data Gathering -- Leadership Positions/Representation**

### **Editors-in Chief**

Ms. Betsy Fruhling of INFORMS in late September 2006, ran a report on "Editor-in-Chief" of INFORMS publications and identified 2/38 editors of the 12 journals (including *ITE*) having been or are female. Dr. Salwa Ammar, the incoming editor of *ITE*, replacing Dr. Erhan Erkut, is female and Dr. L. Robin Keller, will begin her term as editor of *Decision Analysis* in 2007. The two top journals of the society are considered to be *Operations Research* and *Management Science*. *Operations Research* began publication in 1953 and *Management Science* in 1954. Apparently, there has been no female Editor-in-Chief of either of these two top journals.

### **Board of Directors**

Ms. Betsy Fruhling of INFORMS came up with 29 females/117 as members in different positions on Boards of Directors since 1995. Some of the same females have held different positions or multiple terms.

The Chair of the Committee then went to the INFORMS website and noted that, in 2006, 7 out of 16 present members of the Board are females and/or minorities which is commendable.

## **Presidents of INFORMS**

Since 1995, there has been 1 female President, Dr. Karla Hoffman of Georgia Mason University; the two subsequent Presidents are female: in 2007, the President will be Dr. Brenda Dietrich of IBM and in 2008, Professor Cynthia Barnhart of MIT.

## **INFORMS Fellows -- Representation**

Selection as an INFORMS Fellow, marks one of the highest levels of recognition by INFORMS.

In order to identify representation, the Chair of the Committee went to the INFORMS website and resorted to "counting."

In 2002, 4 out of 125 elected Fellows were females (3.2%)

In 2003, 0 out of 13 elected Fellows were female (0%)

In 2004, 4 out of 32 elected Fellows were female (12.4%)

In 2005, 3 out of 25 elected Fellows were female (12%)

To-date, only 5% of the elected INFORMS Fellows are females and this is disappointing.

In 2006, there was only 1 female out of 12 members of the selection committee for INFORMS Fellows.

## **Major INFORMS Prizes -- Research and/or Service**

The below data were obtained by going to the INFORMS website and "counting."

### **Lanchester Prize Winners - Research - we include data from even pre-1995**

From 1954-2005, the committee believes that ALL winners have been males.

### **John von Neumann Theory Prize - Research - we include data from even pre-1995**

From 1975-2005, the committee believes that all recipients have been male.

### **INFORMS President Award - for Welfare of Society**

From 1996-2005, all have been males.

### **George Kimball Medal - for Service - we include data from even pre-1995**

From 1974-2005, there have been three female winners or co-winners.

## **INFORMS Prize for More Junior Members**

### **Dantzig Award**

From 1994-2005, based on the INFORMS website, the committee believes that there has been 1 female winner.

## **Discussion and Some Preliminary Recommendations**

In light of the above, the committee believes that INFORMS is making commendable strides in representing females and minorities on its board, especially given that two of the near-term Presidents will be females. However, it is clear that women have achieved miniscule recognition in terms of their contributions to science and the same situation, the committee suspects, holds in terms of the underrepresentation of minorities.

Two ***immediate recommendations*** of the Senger-Sharma Report are directly applicable to the INFORMS setting additions in quotes are additions made by this committee:

1. Increase the number of women "and minority" scientists in the nomination pool for membership, prizes, and awards.
2. Give visibility to women "and minority" scientists and represent women "and minorities" in the academy's/professional society's portrayal of science.

### **In addition, the committee would like to make the following additional recommendations:**

3. INFORMS should try to capture gender-specific and minority-specific data wherever/whenever possible. The committee recommends that demographical questions be included on the INFORMS membership and registration forms.
4. The committee, during discussions that ensued, following the circulation of the above gathered data, is concerned, as the President of INFORMS, Dr. Mark Daskin has noted, that various constituencies may be feeling left out of the INFORMS organization, which has implications for the strength of INFORMS going into the future. Indeed, the committee also feels that "perception is the reality" and, hence, it **urges INFORMS, with the support of this committee and the WORMS and Minority Issues FORA, to design and conduct a survey of its members regarding representation and diversity.** Since this may be a costly endeavor, we ask that the INFORMS Board to consider the potentiality of such a survey.

Finally, the committee urges that the following additional data be collected:

- Demographic data regarding the recipients of such awards (as well as the finalists) as the Edelman Prize, Moving Spirit Award, Case Competition Award, the Award for Teaching the Practice of ORMS, the Nicholson Prize, and the Judith S. Liebman Award.

- Participation of women and minorities in INFORMS professional development programs should also be considered and quantified: Future Academician, Future Practitioner, and Teaching Effectiveness Colloquia, as well as the Professional Colloquium and Young Researcher Roundtable.
- The demographic composition of the Associate Editors of INFORMS' twelve journals, since this is where the next few generations of Editor-in-Chiefs will be developed.
- The identification of the "top" publishers in *Operations Research* and *Management Science* in order to ascertain the percentage of women and minorities in this group relative to the percentage of INFORMS Fellows and the percentage of the current Editorial Board. It would also be interesting to determine what kind of "networking" effects may be occurring in terms of institutions represented, for example.
- INFORMS conference attendance and paper presentations by women and minorities. Demographics of the organizing committees of INFORMS conferences.
- Demographics of Officers of Subdivisions.
- Demographics of the awards given out by various INFORMS Societies and Sections, which would include, for example, dissertation prizes, best paper awards, lifetime achievement awards, etc.

Finally, the committee believes that it would be illuminating to conduct interviews with "key" individuals as to their perceptions regarding the representation of diversity within INFORMS.

## **Acknowledgments**

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