## OSTP Guidelines Receive High Marks in Wake of Misconduct Cases in 2002

Federal guidelines for research misconduct were tested in 2002 as the materials science and physics communities dealt with two high-profile cases of alleged scientific fraud. Issued in December 2000 by the White House Office of Science and Technology Policy (OSTP), the current policies have their roots in nationally publicized incidents of misconduct during the 1980s and 1990s, most of which were in the biomedical area. In response, OSTP authorized the National Science and Technology Council to develop a government-wide federal policy addressing research misconduct, applicable to all institutions receiving federal funds.

The OSTP guidelines focus on fabrication, falsification, and plagiarism (the so-called FFP approach), according to Arthur Bienenstock of Stanford University, who was involved in drafting the guidelines while serving as OSTP's associate director for science during the Clinton administration. The alleged misconduct must have been committed "intentionally, knowingly, or recklessly," and the primary responsibility lies with the research institutions for inquiry, investigations, and adjudications. OSTP gave federal agencies one year to publish their own implementation plans, although as of March, some had yet to do so. But most of the stragglers are preparing to comply shortly, according to Kathryn Harrington, a spokesperson for OSTP.

Until last year, the physical science community had been confident that the field would remain largely unaffected by the kind of blatant misconduct that had plagued biomedicine. Then came allegations that Victor Ninov, a researcher at the University of California, Berkeley, had fabricated data to support the discovery of element 118. It was followed closely by similar allegations against Hendrik Schön, a Lucent/Bell Laboratories materials scientist also accused of falsifying data to support his work.

Those allegations were borne out by the subsequent investigative committees, who relied heavily on the new federal guidelines as the basis for running their investigations and reaching their conclusions. The guidelines have received almost unanimous high marks from those involved in the investigations.

"They were very useful and not overly prescriptive, providing basic principles as a context in which to make judgments and decisions," said Malcolm Beasley of Stanford University, who chaired the Lucent investigative committee in the Schön matter. "That's very important for a high-level document."

However, the guidelines do not directly address a central issue that is still sparking debate: the responsibilities of co-authors. In both the Berkeley and Lucent cases, there were experienced, respected co-authors involved who nevertheless failed to detect the fabrications.

In the case of element 118, the Berkeley investigative committee upset some members of the scientific community by being sharply critical of Ninov's co-authors.

"Given the importance of the result, it was incredible that no one had looked at the raw data for the particular events claimed to make sure that there had been no errors prior to publication," said George Trilling of Lawrence Berkeley National Laboratory, a member of that committee who participated in a panel discussion on scientific ethics at the March meeting of the American Physical Society in Austin, Texas. "Extraordinary results demand extraordinary supporting evidence, and the burden of proof for an unexpected or major discovery should therefore be much greater than for a routine measurement."

In contrast, Beasley reported that his committee received criticism from some individuals for not chastising Schön's senior co-author more directly. These responses illustrate the complexity of the co-author debate, due in large part to the different cultures of the various subfields. High-energy physics, for example, is characterized by massive projects with hundreds of collaborators. A typical paper can have as many as 500 co-authors, each of whom has made a significant contribution to a small part of the overall project. Hence, it is nearly impossible to define the issue in such a way that would apply to all individual cases.

Because of this, Bienenstock believes that the OSTP guidelines should not be further amended to address the co-author issue, which he feels is a debate more appropriately left to the scientific community to resolve.

"The federal policy represents the law, and it carries with it legal repercussions for research misconduct," he said. "Ethics goes beyond the law. Interesting ethical issues are ones where you have two or more values in conflict: In this case, you want co-authors to take responsibility, but you also want to encourage collaborations of scientists with quite different expertise. You don't want to limit things so much that you hinder good science from being performed."

Both Bienenstock and Beasley stress that the debate over scientific ethics is an ongoing process—one in which the professional scientific societies can play an important role by fostering discussion and setting their own internal policies to address potential fraud.

"It's important to understand why people do this, but it is perhaps more important to understand how much science has changed, and how those changes are demanding a re-examination of professional ethics," said Beasley. "We have not become less ethical, but the circumstances under which we work have changed. We need to adapt accordingly."

Judging by the input received thus far, the OSTP guidelines are a valuable first step along the path to such change.

JENNIFER OUELLETTE

## Six U.S. Federal Agencies to Help Open the "GATE" to Enhanced Manufacturing R&D

Six U.S. federal agencies involved in manufacturing research and development (R&D) have launched a major effort to improve the exchange of information about their technical programs and to collaborate where appropriate to enhance the payoffs from federal investments in this area. The program, called the Government Agencies Technology Exchange in Manufacturing (GATE-M), involves the departments of Commerce (represented by the National Institute of Standards and Technology, or NIST), Defense, and Energy (represented by the National Nuclear Security Administration and the Office of Energy Efficiency and Renewable Energy), as well as the National Aeronautics and Space Administration and the National Science Foundation.

Nano- and microscale systems and technologies make up one of the two topics identified as an initial priority area in which all six GATE-M agencies have activities under way or could benefit from new activity. This area presents many manufacturing and systems issues related to electrical and mechanical applications, assembly, and measuring techniques and tools. GATE-M activities in this area will be coordinated with the work of the National Nanotechnology Initiative.

To foster information exchange, GATE-M participants plan to conduct detailed interagency reviews of programs in the specific areas. They may also jointly sponsor workshops, promote and sponsor the development of "roadmaps" in specific technical areas, and conduct multiagency brainstorming sessions. It is GATE-M's intent to involve the U.S. manufacturing community of industry, government, academia, and manufacturing associations in an integrated effort.

Other technical areas of interest to the



https://doi.org/10.1557/mrs2003.96 Published online by Cambridge University Press

GATE-M agencies include environmentally focused technologies and processes, homeland and national security, manufacturing education, manufacturing process development (metals and composites), manufacturing quality and reliability (measurement and testing), and supply chain/systems integration and interoperability.

For more information, contact David Stieren, NIST Manufacturing Engineering Laboratory, tel. 301-975-3197 and e-mail david.stieren@nist.gov. A copy of the GATE-M report is available online at www.mel.nist.gov/pdfs/ir6950.pdf.

## Belarus Offers Dual Technologies to India

Belarus has offered India dual technologies, that is, technologies to be used for both defense and civilian applications, in various fields including laser, powder metallurgy, electronics, microwave technologies, fuel cells, steel, and optics. An exposition of science and technology was planned for February 24-28, in New Delhi, in which members of the industry and business communities could discuss agreements on technology transfer, production technologies, joint ventures, and joint collaboration.

## China Sets up Nanometer Biotech Lab

The February 28 issue of *China Science and Technology Newsletter*, published by the Republic of China Ministry of Science and Technology, has announced the establishment of the Nanometer Biotechnology Laboratory at Zhongnan University. The laboratory brings together national experts in materials, chemistry, and medicine to find nano-biotechnology applications in medicine. China has listed the area of nano-biotechnology as a priority and has established major projects under its national programs as well as programs sponsored by the National Natural Science Foundation of China.

## Hungarian–South African Program Announces Call for Proposals

The Ministry of Education in Hungary and the National Research Foundation in South Africa have announced a call for proposals for joint research and development projects, symposia, conferences, and workshops. Priority areas include new materials and manufacturing as well as the sustainable management of environmental issues and natural resources. Cooperating organizations may include scientific institutes, scientific societies, universities, and other research and development organizations. The deadline for the submission of proposals is **June 11, 2003**. For further information and applications, the following agencies can be contacted: Ministry of Education, Research and Development Division, Szervita tér 8, H-1052, Budapest, Hungary; tel. 36-1-484-2573; fax 36-1-266-0254; e-mail peter. judak@om.hu; or the National Research Foundation, International Science Liaison, PO Box 2600, Pretoria 0001, South Africa; tel. 27-12-481-4025; fax 24-12-481-4044; e-mail Hannekie@nrf.ac.za; or access Web site www.nrs.ac.za/funding/docs/hungarycall.pdf.

## Canadian NRC Announces Nanotechnology Institute

Plans for the permanent home of the Canadian National Research Council's (NRC) National Institute for Nanotechnology (NINT) were unveiled in March in Edmonton, Alberta. In order to provide optimal conditions for nanoscale research, the design of the new building includes ultralow vibration and minimal acoustical noise and electromagnetic interference. The plans were unveiled by Arthur Carty, president of the NRC; Roderick Fraser, president of the University of Alberta; and Dan Bader, deputy minister of Alberta Innovation and Science, on behalf of Victor Doerksen, minister of Alberta Innovation and Science.

As a partnership between the government of Canada through NRC, the government of Alberta, and the University of Alberta, NINT will enable NRC and the university to expand collaborations in nanotechnology research. This will include the synthesis of new materials and the integration of nanotechnology with microtechnologies to make practical systems. Specialized spaces include laboratories for chemical and biochemical synthesis and analysis of the material structure at the atomic scale, as well as a Class-1000 clean room for the production of nanostructured systems. NINT is purchasing the latest generation of scientific equipment, including electron and scanning probe microscopes and chemical and materials analysis instruments.

Doerksen said, "As the permanent home for this emerging technology sector, the Institute provides an opportunity for Alberta's researchers, businesses, and venture capitalists to demonstrate our province's strengths in nanosystems technology, research, and commercialization."

## UK Invests in Scientific Excellence

Universities and higher-education institutions in the United Kingdom received a cash boost in February as Science Minister Lord David Sainsbury announced their share of funding in scientific excellence. Sainsbury announced the allocations during a visit to the University of Birmingham, where he opened two new laboratories funded by earlier awards.

More than 150 universities and institutions will benefit from this investment in world-class facilities to enable vital research in areas including developing key innovations such as nanotechnology. The investment provided under the Science Research Investment Fund (SRIF) for 2004 to 2006 is allocated by formula. Institutions are able to spend their allocation in line with their own research strategies and must submit their list of proposed projects to their Higher Education Funding Council by May 30, 2003.

Higher Education Minister Margaret Hodge said, "We cannot remain at the cutting edge of research if we are dependent on aging and inadequate buildings and equipment. This funding will provide further crucial help in turning round years of under-investment. Together with the other substantial increases in funding we have recently announced, this investment will ensure that our higher-education institutions have the resources they need to compete on the global research stage." This new fund builds on the earlier success of the Joint Infrastructure Fund (1999–2002) and the allocations made to institutions in the first round of SRIF (2002–2004).

The University of Manchester multidisciplinary nanoworkshop benefited in the first round of SRIF funding. Also, work has started on a new building that will house the recently established London Centre for Nanotechnology (LCN), a joint venture between University College London (UCL) and Imperial College London that will bring together materials scientists, engineers, chemists, biologists, physicists, and medical researchers from both colleges. It is due to be completed by spring 2004.

During the LCN's first advisory board meeting on February 24, recently recruited scientists described their work. Topics included composites containing both carbon nanofibers and poly(etherether ketone) (PEEK) polymer fibers, measuring and manipulating materials such as quantum dots, and computer modeling of nanostructures such as bismuth nanolines on silicon.

The funding will be distributed by the Higher Education Funding Councils for England, Wales, Scotland, and the Department for Education and Learning Northern Ireland. □



https://doi.org/10.1557/mrs2003.96 Published online by Cambridge University Press