

## U.S. – Ireland R&D Partnership MEMORANDUM OF UNDERSTANDING

A Memorandum of Understanding (MOU) regarding National Science Foundation (NSF), Science Foundation Ireland (SFI), and Invest Northern Ireland (Invest NI)/Department for Employment and Learning (DEL) joint funding activity for research and education in the areas of science and engineering.

### **Statement of Intent and Scope of this Document**

This MOU establishes the terms under which the three jurisdictions, NSF, SFI, and Invest NI/DEL will conduct joint funding of research and education, particularly in the areas of nanoscale science and engineering, sensors and sensor networks, telecommunications, and energy and sustainability. This document describes plans for the preparation, receipt, and review of proposals, as well as the administrative processes in which the four agencies will cooperate in the monitoring and funding of successful proposals.

### **Authorities**

NSF is acting pursuant to the National Science Foundation Act of 1950 as amended, 42 USC 1861 *et seq.*

In July 2003, SFI was established on a statutory basis under the Industrial Development (Science Foundation Ireland) Act, 2003. Complete information and the text of this Act may be found at:

<http://www.gov.ie/bills28/bills/2002/4702/default.htm>.

Invest Northern Ireland was established in 2002 under the Industrial Development Act (Northern Ireland) 2002. More information can be found on the HMSO website:

<http://www.hmso.gov.uk/legislation/northernireland/nisr/yeargroups/2000-2003/2002/2002ania/aos/c1.htm>.

The Department for Employment and Learning (formerly known as the Department of Higher and Further Education, Training and Employment) is one of 11 Northern Ireland Departments established in 1999 by the Departments (Northern Ireland) Order 1999 to exercise functions conferred on it by that Order (Schedule 2 and Schedule 3), the Northern Ireland Act 1998 and other legislation. Further information can be found at [www.delni.gov.uk](http://www.delni.gov.uk). (A twelfth Department – the Department of Justice – was subsequently established by the Department of Justice Act (Northern Ireland) 2010).

These authorizations for the four organizations, together with the internal policies and procedures of each, define the authority of these organizations to

establish and manage programs in the research fields included in this agreement.

## **Synopsis of Program**

In order to foster an increase in collaborative relationships, the NSF, SFI, and Invest NI/DEL have agreed to enter into a partnership to support research and education in the areas of nanoscale science and engineering, sensors and sensor networks, telecommunications, and energy and sustainability through competitive awards via existing (core) programs in the case of NSF and SFI, and, in the case of Invest NI/DEL, via these organizations' R & D funding mechanisms.

### ***United States***

#### **Participating NSF Directorates and Offices include:**

Biological Sciences (BIO)  
Computer & Information Sciences & Engineering (CISE).  
Engineering (ENG)  
Geosciences (GEO)  
Mathematical & Physical Sciences (MPS)  
Social, Behavioral & Economic Sciences (SBE)  
Education & Human Resources (EHR)  
Office of Cyberinfrastructure (OCI)  
Office of International Science & Engineering (OISE)  
Office of Integrative Activities

### ***Ireland***

#### **Participating SFI Directorates include:**

Information, Communications & Emergent Technologies Directorate  
LifeSciences Directorate

### ***Northern Ireland***

#### **Participating Invest NI Directorates include:**

Innovation, Research and Technology Division

#### **Participating DEL Directorates include:**

Higher Education Division

## **Proposal & Award Process**

The organizations will manage this process through their relevant funding programs/mechanisms. Information concerning this program will be placed on each organization's website, giving the background to the U.S.-Ireland R&D Partnership and details on how proposals will be considered.

### **Proposal Preparation & Submission to NSF**

Tri-jurisdictional, integrated proposals to NSF will be submitted to those programs funding research and education in the areas of nanoscale science and engineering (Attachment A), sensors and sensor networks (Attachment B), telecommunications (Attachment C), and energy and sustainability (Attachment D) or to the Office of International Science and Engineering (Attachment E).

Applicants will submit their proposals in conformance with the guidelines specified in the NSF Grant Proposal Guide (GPG)

[http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=gpg](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg) or the NSF Grants.gov Application Guide

[http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=grantsgovguide](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide).

All proposals must be submitted to NSF via use of the NSF FastLane System or Grants.gov.

Proposals must include the full project descriptions for all three jurisdictions, and must include three budgets, the full NSF budget and two additional half-page budgets for Ireland and Northern Ireland. The project descriptions and budget pages for the Ireland and Northern Ireland jurisdictions should be included in the Supplementary Documents section of the proposal. The names of the corresponding Program Managers from Ireland and Northern Ireland must be provided in the respective budget justification and will be used as a contact reference by the NSF Program Manager.

### **Submission of Proposals from Ireland and Northern Ireland**

#### Outline/Summary Proposals

SFI and Invest NI/DEL applicants are required to submit draft outline/summary proposals and budget requests to SFI and to Invest NI/DEL 6 weeks in advance of the applicable NSF submission deadline in order to check eligibility. SFI applicants are subject to SFI eligibility criteria. Note that any applicants who have been awarded a Planning Grant from SFI or Invest NI, and have submitted their post-planning grant award reports to their respective funding organizations, are not required to submit a draft proposal, but must contact the relevant SFI or Invest NI Program Officer to discuss their budget request in advance of full submission.

#### Full Proposals

Applicants must simultaneously submit identical copies of full proposals to SFI and Invest NI/DEL.

Eligible applicants for funding from SFI must submit the proposal with a standard cover sheet signed and stamped by the relevant VP for Research/Dean of Research along with an appendix outlining the Ireland applicant's budget requested (on a standard SFI budget template) and provide justification for the funding requested. The appendix should be no longer than 3 pages in total.

Applicants for funding from Invest NI/DEL must submit the proposal with an Invest NI/DEL cover sheet signed and stamped by the relevant Pro Vice Chancellor for Research and the Dean/Head of School. Both SFI and Invest NI/DEL will require scanned copies of original signatures.

### **Principal Investigators (PIs)**

Each proposal must have a minimum of one Principal Investigator from each jurisdiction. Proposals submitted to NSF must be submitted by the U.S. PIs' home institution. PIs from Ireland and Northern Ireland will be identified as Senior Personnel in the proposal submitted to NSF.

### **Review Process**

Proposals received at NSF will be evaluated in accordance with the standard NSF merit review criteria of intellectual merit and broader impacts of the proposed effort. In addition, reviewers will be asked to assess the international collaboration in terms of mutual benefits, true intellectual collaboration among the international partners, benefits to be realized from the expertise and specialized skills, facilities, sites and/or resources of the international counterparts, and active research engagement of students and early-career researchers, where such individuals are engaged in the project.

The review will be conducted using the NSF merit review process, including conflict of interests and confidentiality policies. The process may include use of *ad hoc* mail reviewers, as needed, in combination with review panelists who meet, discuss the proposals, and make recommendations to NSF. Review procedures also may include provision for summary rankings by the panel.

The NSF will review documents for each proposal -- written reviews, panel summaries, if any, and panel rankings, if any, and will share this information (without reviewer identities) with the Program Directors in SFI and Invest NI/DEL for the purpose of coordinating funding of research. Both SFI and Invest NI/DEL will keep these shared documents confidential to the maximum extent possible by law. SFI and Invest NI/DEL further agree that they will disclose these shared documents internally only on a "need to know" basis.

Consideration of requests for funding of the Ireland and Northern Ireland elements of each proposal will be dependent upon receipt by SFI and Invest NI/DEL of confirmation by NSF of that organization's agreement to fund the U.S. element of each proposal and a positive assessment by NSF of the technical merits of the entire project across all three jurisdictions. Applicants from Ireland and Northern Ireland should note that SFI and Invest NI/DEL reserve the right to adjust budgets where they deem this to be appropriate.

### **Award Process**

Proposals selected for potential funding by each organization will be considered in line with each organization's respective policies and practices.

The form of award instrument shall be at the option of the funding organization. **No funds will be transferred between agencies. There will be no cross-organization co-funding of individual awards.** The issuance and administration of awards will be carried out by the relevant funding organization. Each award will contain an acknowledgement of this joint NSF/SFI/Invest NI/DEL initiative.

Funding for the Northern Ireland elements of NSF-approved proposals will be conditional upon acceptance by the relevant University of a Letter of Offer issued by DEL.

#### **Post-award Process**

Co-investigators will be required to submit identical annual written progress reports to their relevant Program Managers in each of the four funding organizations. Co-investigators must use the project report format identified in the NSF FastLane System for this purpose.

Any comments or concerns on the part of any one of the funding organizations with respect to the progress reported will be mutually shared.

Decisions on discontinuation of funding will be made jointly by agreement between the four funding organizations.

SFI and Invest NI/DEL reserve the right to assess the progress of any project, at any time of their choosing, during the lifetime of awards made under the auspices of the U.S.-Ireland R & D Partnership.

#### **Approval, Amendments, Duration, and Termination**

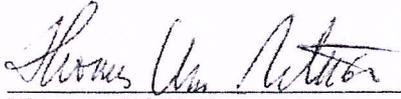
This MOU is effective upon signature by the NSF Assistant Director for Engineering, the SFI Director General, the Invest NI Managing Director of Innovation and Capability Development and the DEL Director of Higher Education.

This MOU remains in effect through to the end of U.S. FY 2012. The program is effective starting September 1, 2010.

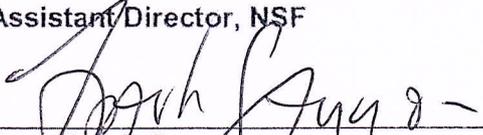
This MOU may be amended by written agreement between NSF, SFI, and Invest NI/DEL.

NSF, SFI, or Invest NI/DEL may terminate this agreement by advance written notice, by at least ninety (90) days, or by the agreement in writing of all parties.

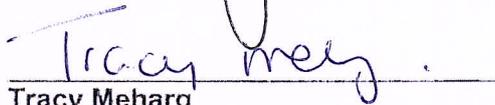
Executed this 18 day of October, 2010.



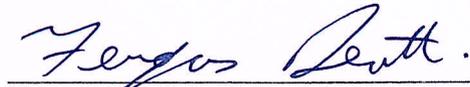
Thomas W. Peterson  
Assistant Director, NSF



Prof. Frank Gannon  
Director General, Science Foundation Ireland



Tracy Meharg  
Managing Director, Innovation and Capability Development Group,  
Invest NI



Fergus Devitt  
Director of Higher Education, Department for Employment and Learning

## A. National Nanotechnology Initiative, FY 2011

For fiscal year 2011, the National Science Foundation budget request for the National Nanotechnology Initiative (NNI) is approximately \$400 million. All participating research and education directorates and the Office of International Science and Engineering (OISE) accept proposals with an international component following a competitive selection process. NSF grants generally support only expenses made by the U.S. universities for research and education, for U.S. participants in international interactions such as workshops, and for research visits abroad by U.S. students and faculty.

The participating directorates and offices are: Biological Sciences (BIO), Computer and Information Sciences and Engineering (CISE), Engineering (ENG), Geosciences (GEO), Mathematical and Physical Sciences (MPS), Social, Behavioral and Economic Sciences (SBE), Education and Human Resources (EHR), and Office of International Science and Engineering (OISE).

General information about NNI specific programs can be found on [www.nsf.gov/nano](http://www.nsf.gov/nano), on NSF's core programs on [http://www.nsf.gov/funding/research\\_edu\\_community.jsp](http://www.nsf.gov/funding/research_edu_community.jsp), and on OISE programs on <http://www.nsf.gov/div/index.jsp?div=OISE>.

NSF supports nanoscale science and engineering in FY 2011 through various programs. The following program directors may provide further information:

BIO: Alan Tessier, [atessier@nsf.gov](mailto:atessier@nsf.gov)  
CISE: Sankar Basu, [sbasu@nsf.gov](mailto:sbasu@nsf.gov)  
ENG: Clark Cooper, [ccooper@nsf.gov](mailto:ccooper@nsf.gov)  
GEO: Enriqueta Barrera, [ebarrera@nsf.gov](mailto:ebarrera@nsf.gov)  
MPS: Tom Rieker, [trieker@nsf.gov](mailto:trieker@nsf.gov)  
SBE: Michael Gorman, [mgorman@nsf.gov](mailto:mgorman@nsf.gov)  
EHR: John Bradley, [jbradley@nsf.gov](mailto:jbradley@nsf.gov)  
OISE: Cassandra Dudka, [cdudka@nsf.gov](mailto:cdudka@nsf.gov)

**International supplements:** Awards made in previous fiscal years for individual investigators, groups, centers, and user facilities can be supplemented by the programs. The NSF award database can be accessed from [www.nsf.gov/nano](http://www.nsf.gov/nano).

## B. Sensors and Wireless Sensor Networks, FY 2011

The participating directorates and offices are: Biological Sciences (BIO), Computer and Information Sciences and Engineering (CISE), Engineering (ENG), Geosciences (GEO), Mathematical and Physical Sciences (MPS), Social, Behavioral and Economic Sciences (SBE), Education and Human Resources (EHR), and Office of International Science and Engineering.

NSF grants generally support only expenses made by the U.S. universities for research and education, for U.S. participants in international interactions such as workshops, and for research visits abroad by U.S. students and faculty.

General information on NSF's core programs can be found at [http://www.nsf.gov/funding/research\\_edu\\_community.jsp](http://www.nsf.gov/funding/research_edu_community.jsp) , and on OISE programs at <http://www.nsf.gov/div/index.jsp?div=OISE> .

NSF supports sensor and wireless sensor network research and education in FY 2011 through various programs. The following program directors may provide further information:

BIO: Elizabeth Blood, [eblood@nsf.gov](mailto:eblood@nsf.gov)  
CISE: Alhussein Abouzeid, [aabouzei@nsf.gov](mailto:aabouzei@nsf.gov)  
ENG: Bruce Hamilton, [bhamilto@nsf.gov](mailto:bhamilto@nsf.gov)  
GEO: Cliff Jacobs, [cjacobs@nsf.gov](mailto:cjacobs@nsf.gov)  
MPS: Zeev Rosenzweig, [zrosenzw@nsf.gov](mailto:zrosenzw@nsf.gov)  
SBE: Sandra Schneider, [sschneid@nsf.gov](mailto:sschneid@nsf.gov)  
EHR: Russell Pimmel, [rpimmel@nsf.gov](mailto:rpimmel@nsf.gov)  
OIA: Henry Blount, [hblount@nsf.gov](mailto:hblount@nsf.gov)  
OISE: Cassandra Dudka, [cdudka@nsf.gov](mailto:cdudka@nsf.gov)

**International supplements:** Awards made in previous fiscal years for individual investigators, groups, centers, and user facilities can be supplemented by the programs. The NSF award database can be accessed from [www.nsf.gov](http://www.nsf.gov).

## C. Telecommunications Research, FY 2011

The National Science Foundation supports a variety of programs directed towards telecommunications research and education. Areas of interest include: wireless devices, components, and networks; optics and photonics devices and networks; sensor devices and networks; signal processing; network architecture design, modeling and simulation; security; packaging, thermal management and energy; and future internet technology. Participating directorates and offices are Engineering, (ENG) Computer and Information Sciences and Engineering, (CISE), Office of Cyberinfrastructure (OCI), and Office of International Science and Engineering (OISE). Participating directorates and offices accept proposals with an international component following a competitive selection process. NSF grants generally support only expenses made by the U.S. universities for research and education, for U.S. participants in international interactions such as workshops, and for research visits abroad by U.S. students and faculty.

General information on NSF's core programs can be found at [http://www.nsf.gov/funding/research\\_edu\\_community.jsp](http://www.nsf.gov/funding/research_edu_community.jsp) , and on OISE programs at <http://www.nsf.gov/div/index.jsp?div=OISE> .

NSF supports telecommunications research and education in FY 2011 through various programs. The following program directors may provide further information:

ENG: Samir El-Ghazaly, [selghaza@nsf.gov](mailto:selghaza@nsf.gov)  
CISE: Victor Frost, [vsfrost@nsf.gov](mailto:vsfrost@nsf.gov)  
OCI : Manish Parashar, [mparasha@nsf.gov](mailto:mparasha@nsf.gov)  
OISE: Cassandra Dudka, [cdudka@nsf.gov](mailto:cdudka@nsf.gov)

**International supplements:** Awards made in previous fiscal years for individual investigators, groups, centers, and user facilities can be supplemented by the programs. The NSF award database can be accessed from [www.nsf.gov](http://www.nsf.gov).

## D. Energy and Sustainability, FY 2011

The National Science Foundation supports fundamental research and education that underpins the development of innovative solutions to pressing problems in sustainability, especially research on sustainable and renewable energy technologies. Research will investigate the fundamental role that social, economic, and political systems play in creating and addressing major issues in sustainability. It will include conceptual, theoretical, empirical, and computational research needed to further develop the basic science, engineering, education, and policy knowledge base, as well as address the coupled problems of sustainability - dealing directly with the energy-economy-environment dilemma - at both the individual factor and systems level. NSF's unique mandate to support all areas of science, engineering and science education allows it to fund research that will tackle complex system level problems of sustainability.

All participating research and education directorates and the Office of International Science and Engineering (OISE) accept proposals with an international component following a competitive selection process. NSF grants generally support only expenses made by the U.S. universities for research and education, for U.S. participants in international interactions such as workshops, and for research visits abroad by U.S. students and faculty.

The participating directorates and offices are: Biological Sciences (BIO), Computer and Information Sciences and Engineering (CISE), Engineering (ENG), Geosciences (GEO), Mathematical and Physical Sciences (MPS), Social, Behavioral and Economic Sciences (SBE), Education and Human Resources (EHR), , and Office of International Science and Engineering (OISE).

General information about Energy and Sustainability specific programs can be found on [http://www.nsf.gov/pubs/2010/nsf10040/nsf10040.jsp?WT.mc\\_id=USNSF\\_80](http://www.nsf.gov/pubs/2010/nsf10040/nsf10040.jsp?WT.mc_id=USNSF_80), on NSF's core programs on [http://www.nsf.gov/funding/research\\_edu\\_community.jsp](http://www.nsf.gov/funding/research_edu_community.jsp), and on OISE programs on <http://www.nsf.gov/div/index.jsp?div=OISE>.

NSF supports energy and sustainability in FY 2011 through various programs. The following program directors may provide further information:

BIO: Charles Liarakos, [cliarako@nsf.gov](mailto:cliarako@nsf.gov)  
CISE: John Cozzens, [jcozzens@nsf.gov](mailto:jcozzens@nsf.gov)  
ENG: Greg Rorrer, [grorrer@nsf.gov](mailto:grorrer@nsf.gov)  
GEO: Pam Stephens, [pstephens@nsf.gov](mailto:pstephens@nsf.gov)  
MPS: Linda Sapochack, [lsapocha@nsf.gov](mailto:lsapocha@nsf.gov)  
SBE: Robert O'Conner, [roconner@nsf.gov](mailto:roconner@nsf.gov)  
EHR: Osman Shinaishin, [oshinais@nsf.gov](mailto:oshinais@nsf.gov)  
OIA: Henry Blount, [hblount@nsf.gov](mailto:hblount@nsf.gov)  
OISE: Cassandra Dudka, [cdudka@nsf.gov](mailto:cdudka@nsf.gov)

**International supplements:** Awards made in previous fiscal years for individual investigators, groups, centers, and user facilities can be supplemented by the programs. The NSF award database can be accessed from [www.nsf.gov](http://www.nsf.gov).

## E. Office of International Science and Engineering (OISE)

NSF's Office of International Science and Engineering (OISE) serves as NSF's focal point for international science and engineering activities. OISE supports – either through its own programs or working with the other NSF directorates and offices – innovative awards and supplements that promote research excellence through new international collaboration and that develop the next generation of globally engaged scientists and engineers. OISE funds international research and education activities in all NSF-supported disciplines involving any region of the world. Researchers interested in international collaboration should consult both disciplinary and OISE program officers. The OISE Home Page is <http://www.nsf.gov/div/index.jsp?div=OISE>

NSF grants generally support only expenses made by the U.S. universities for research and education, for U.S. participants in international interactions such as workshops, and for research visits abroad by U.S. students and faculty.

Relevant OISE programs in FY 2011 include:

### **International Research and Education: Planning Visits and Workshops (NSF 04-035):**

([http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=12815&org=OISE&from=home](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=12815&org=OISE&from=home))

- **International Planning Visits:** Travel to plan collaborative research with prospective foreign partners. (No deadlines apply. Proposals may be submitted at any time.)
- **International Workshops:** Meetings to identify common priorities and approaches for collaboration on specific, well-defined research areas. Note: OISE does not support US participation in international conferences. (Target Dates: September 20, 2010, February 20, 2011, May 20, 2011.)

### **Developing Global Scientists and Engineers (NSF 04-**

**036):**[http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=12831&org=OISE&from=home](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=12831&org=OISE&from=home)

- **International Research Experiences for Students:** Enable faculty at US institutions to organize international research experiences for US undergraduate and graduate students. (Target Dates: September 15, 2010 and Annually Thereafter.)
- **Doctoral Dissertation Enhancement Projects:** Support dissertation research by US graduate students at a foreign site. (No deadlines apply. Proposals may be submitted at any time.)

### **International Research Fellowship Program (IRFP, NSF 06-582):**

[http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5179&org=OISE&from=home](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5179&org=OISE&from=home)

- Support for US citizens or permanent residents with a recent PhD to conduct research at institutions outside the United States. (Target Date: September 14, 2010 and second Tuesday in September Annually Thereafter.)

**Additional support:** In addition to its own programs, OISE will continue to co-fund proposals submitted to NSF's disciplinary programs and will consider highly meritorious requests for international supplements to current NSF awards. For more information on these funding opportunities, please see OISE's home page: <http://www.nsf.gov/div/index.jsp?div=OISE>