



**National Science Foundation**  
4201 Wilson Boulevard  
Arlington, Virginia 22230

**NSF 16-102**

**Dear Colleague Letter - Collaborative Supplemental Funding Opportunity in Graphene and 2D Layered Materials and Devices under the U.S. NSF/ENG - US-EC International Opportunity**

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July 12, 2016

**Scope**

The Directorate for Engineering (ENG) of the National Science Foundation (NSF) is pleased to announce a U.S.-EU collaborative research opportunity. The goal is to enable research synergy through international collaboration and reduce some of the current barriers to working internationally. NSF/ENG, the NSF Office of International Science and Engineering (OISE) and the Directorate-General for Communications Networks, Content and Technology of the European Commission (EC) will address these points by allowing U.S. and EU researchers to submit requests for funding that will be considered as supplements to existing grants. More specifically, this will be in the form of funding available for international collaboration between the U.S. and the EU in the area of Graphene and two-dimensional (2D) Layered Materials and Devices.

The scheme foresees mechanisms for NSF-supported researchers and for researchers working in research labs which are partners in the Graphene Flagship to obtain funding to enable visits or stays of a few months in Graphene Labs across the Atlantic:

- NSF/ENG encourages U.S. researchers to submit requests for supplemental funding to existing grants to support collaborative research in Graphene and 2D Layered Materials and Devices.
- The EC Graphene Flagship project has reserved funding for interested EU Researchers in this U.S.-EU collaboration. For further information on Graphene Flagship funding opportunities see <http://graphene-flagship.eu/>

This joint mobility collaboration opportunity is one of the outcomes of the “U.S. EU-Flagship Workshop on Graphene and Beyond 2D Layered Materials and Devices” that took place in Arlington, Virginia (USA) in April 2015. The full report of this workshop is available at <http://engineering.utep.edu/useu2dworkshop/>

**NSF funding opportunities:** NSF encourages collaboration between the U.S. and international research communities. International collaboration arrangements are encouraged whereby the costs of U.S.-based researchers are borne by the NSF, and the costs of the international researchers are supported from NSF counterpart agencies in their country or region. In the opportunity highlighted in this Dear Colleague Letter (DCL), European collaborators are expected to be supported by the European Commission.

The Emerging Frontiers in Research and Innovation (EFRI) 2-Dimensional Atomic-layer Research in Engineering (2-DARE) program provides a platform for unveiling the fundamental properties of 2D layered material systems beyond graphene, including their heterostructures, and harnessing these properties for novel device applications. Collaborative opportunities between the U.S. teams having received 2-DARE Awards (as well as individual investigators holding an NSF grant in this area) and participants in the EU Graphene Flagship Initiative are considered to be of major importance for advancing the field and are strongly encouraged. Interested U.S. Principal Investigators (PIs) with

ongoing NSF funded activities are encouraged to contact the Program Director of their current NSF award. Expressions of interest will be considered by NSF Program Officers and if appropriate, PIs will be encouraged to submit supplemental funding requests via Fastlane. These supplemental requests will be evaluated by the appropriate NSF Division, and will be reviewed by Program Directors. If found appropriate they will be considered for funding through the Division responsible for the PI's existing award and the Office of International Science and Engineering (OISE).

The above mechanism for U.S.-based researchers would complement other existing, broader funding opportunities, in particular those offered by NSF and the European Research Council (ERC), the Air Force Office of Scientific Research (AFOSR), and the Army Research Office (ARO).

**Graphene Flagship funding opportunities:** The Flagship consortium foresees a system of stipends for travel to and living costs in the U.S. Such stipends would be available through a Flagship-internal competition aimed in particular at EU researchers in the early stage of their career. The Flagship will establish and publish a set of clear and transparent criteria to select the most promising proposals for exchange, based amongst others on the ongoing research activities within the Flagship and the expected benefits from collaboration activities with research groups in the U.S. The application/evaluation and the actual stay would take place in the period 2016-2017.

### **Other Opportunities:**

NSF would like to make existing grantees aware of additional government funding to support international collaborations in the areas of Graphene and 2D Layered Materials and Devices. The funding mechanisms available through two of these Agencies (AFOSR and ARO) are described below. Proposers are encouraged to discuss with the appropriate contact person listed at the end of the Dear Colleague Letter which would be the most appropriate mechanism for funding collaborative efforts.

#### **Air Force Office of Scientific Research (AFOSR) funding opportunities:**

Several portfolios within AFOSR (<http://www.wpafb.af.mil/afri/afosr/>) support basic research on 2D materials. Each portfolio manager or associated program has the opportunity to support international collaborations and exchanges. Please refer to the following links for more information:

<http://www.wpafb.af.mil/library/factsheets/factsheet.asp?id=16662> and

<http://www.grants.gov/web/grants/view-opportunity.html?oppld=276388>. AFOSR's International Office manages additional programs that support international student exchanges. The exchanges, which may be for students either to or from a US institution, must be as part of a current AFOSR grant. **AFOSR contact: Kenneth Goretta, [kenneth.goretta@us.af.mil](mailto:kenneth.goretta@us.af.mil).**

#### **Army Research Office (ARO) funding opportunities:**

The ARO (<http://www.arl.army.mil/www/default.cfm?page=29>) is very much interested in advancing Army relevant, long term, basic research areas in 2D materials. Investigators working in these areas in the US and Europe are encouraged to refer to ARO's Broad Agency Announcements (BAA) at

<http://www.arl.army.mil/www/default.cfm?page=8> or the US Army International Technology Center at

<http://www.rdecom.army.mil/rfecatl/> to get more details about the current programs and funding opportunities. **ARO contact: Chakrapani Varanasi, [chakrapani.v.varanasi.civ@mail.mil](mailto:chakrapani.v.varanasi.civ@mail.mil).**

### **Supplement Preparation and Submission**

Supplemental funding requests will be accepted for collaborative research in the research areas described in this DCL as described below.

1. U.S. proposers must prepare and submit requests for supplemental funding in accordance with the guidance contained in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG): Part II, *Award and Administration Guide* (AAG): [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=aag](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag) and the additional instructions in this DCL.

2. EU collaborators and/or partnering EU researchers will be funded through European funding.
3. Supplemental funding requests should be submitted to the NSF by the current U.S. grantee institution (the EU collaborator cannot be listed as a formal co-PI on the application). However, in the request for supplemental funding, the nature of the collaboration, the role of the EU partner (s) and planned funding, facilities, and PI CVs must be described.
4. The U.S. grantee institution will submit to the relevant NSF/ENG/ program according to NSF policies, using the NSF Fastlane system (<https://www.fastlane.nsf.gov/>). Funds for EU proposers will be made available by the EU's Graphene Flagship. EU proposals should be submitted to [admin@graphene-flagship.eu](mailto:admin@graphene-flagship.eu). Please see <http://graphene-flagship.eu/> for further details.
5. The request for supplemental funding should indicate that the request is to be considered under the potential activities described by this DCL by prefacing the first line of the Summary of Proposed Work with "NSF/ENG/EU:"
6. Biographical sketches of all senior U.S. and EU personnel should be prepared in accordance with the NSF standard biographical sketch format and uploaded in one PDF file as a Supplementary Document.
7. An agreement letter from the EU's Graphene Flagship hosting lab should be included as a Supplementary Document.

## **Merit Review**

1. NSF/ENG/EU supplemental funding requests will be reviewed using standard NSF procedures for supplements.

Supplemental funding requests will be reviewed in accordance with NSF's review criteria by evaluating the proposed project on both its intellectual merit and broader impacts. A description of the NSF merit review process is provided on the NSF merit review website at:

[http://www.nsf.gov/bfa/dias/policy/merit\\_review/](http://www.nsf.gov/bfa/dias/policy/merit_review/) .

Information on the participating Divisions, Directorates, and Agencies can be found in:

### **NSF/ENG/ECCS**

Electrical, Communications and Cyber Systems Website: <http://www.nsf.gov/div/index.jsp?div=ECCS>

### **NSF/ENG/EFMA**

Emerging Frontiers and Multidisciplinary Activities Website: <https://www.nsf.gov/div/index.jsp?org=EFMA>

### **EC**

EU Graphene Flagship Program: <http://graphene-flagship.eu/>

EU Graphene Flagship Research Opportunity: <http://graphene-flagship.eu/news/Pages/Transatlantic-research-opportunity.aspx>

### **AFOSR**

Air Force Office of Scientific Research Website: <http://www.wpafb.af.mil/afri/afosr/>

### **ARO**

Army Research Office Web Site: <http://www.arl.army.mil/www/default.cfm?page=29> .

*The main points of contact are:*

### **NSF/ENG**

Dimitris Pavlidis, ENG/ECCS, [dpavli@nsf.gov](mailto:dpavli@nsf.gov)

### **AFOSR**

Kenneth Goretta, [kenneth.goretta@us.af.mil](mailto:kenneth.goretta@us.af.mil)

**ARO**

Chakrapani Varanasi, [chakrapani.v.varanasi.civ@mail.mil](mailto:chakrapani.v.varanasi.civ@mail.mil)

**For the EU: The Graphene Flagship**

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