



## BROAD AGENCY ANNOUNCEMENT (BAA)

### **Basic Research Challenge (BRC) Program**

#### **Introduction**

This publication constitutes a Broad Agency Announcement (BAA) as contemplated in Department of Defense Grant and Agreement Regulation (DODGARS) 22.315(a). A formal Request for Proposals (RFP), solicitation, and/or additional information regarding this announcement will not be issued. Request for same will be disregarded.

The Office of Naval Research (ONR) will not issue paper copies of this announcement. The ONR reserves the right to select for award all, some or none of the proposals submitted in response to this announcement. The ONR provides no funding for direct reimbursement of proposal development costs. Technical and cost proposals (or any other material) submitted in response to this BAA will not be returned. It is the policy of ONR to treat all proposals as sensitive competitive information and to disclose their contents only for the purposes of evaluation.

The ONR Basic Research Challenge Program (BRC) is sponsored by the Office of Naval Research (ONR).

Awards will take the form of grants. Therefore, proposals submitted as a result of this announcement will fall under the purview of the Department of Defense Grant and Agreement Regulations (DoDGARs).

## **I. GENERAL INFORMATION**

### **1. Agency Name**

Office of Naval Research  
875 North Randolph Street - Suite 1425  
Code 03R  
Arlington, VA 22203-1995

### **2. Research Opportunity Title**

Basic Research Challenge (BRC) Program

### **3. Program Name**

Basic Research Challenge (BRC) Program

### **4. Research Opportunity Number**

BAA Number: 09-017

### **5. Response Date**

White Papers: 17 April 2009

Full Proposals: 9 June 2009

### **6. Research Opportunity Description**

The Basic Research Challenge (BRC) program supports basic science and/or engineering research within academia and industry. The program is focused on stimulating new, high-risk basic research projects.

The BRC for FY 2009 is for the three (3) topics listed below. The detailed descriptions are intended to provide the proposer a frame of reference and are not meant to be restrictive to the possible approaches to achieving the goals of the topic and the program. Innovative ideas addressing these research topics are highly encouraged. White papers and full proposals addressing the following BRC topics are solicited:

- (1) Irreducible Uncertainty and the Limits of Predictability
- (2) Elastomeric Polymer-by-Design to Protect the Warfighter against Traumatic Brain Injury by Diverting the Blast Induced Shock Waves from the Head
- (3) DNA-based Molecular-scale Nanoelectronics Fabrication

## **SPECIFIC BRC TOPICS**

### **FY2009 BRC Topic #1**

#### **Irreducible Uncertainty and the Limits of Predictability**

**Background:** Numerical models are often used to predict the behavior of complex physical systems. The predictions made using these models contain various types of errors, which lead to uncertainty in the resulting forecast. For most deterministic predictions, the uncertainty arises from two primary sources: errors within the model itself and imperfect knowledge of the initial conditions and forcing functions.

When modeling geophysical fluid dynamics, operational forecasts have traditionally been made using a “perfect model” assumption. However, for many complex systems driven by non-linear dynamics (e.g. weather and climate), the errors in the numerical models can easily swamp the errors arising from imperfect initial conditions. The impact of model error on the predictability of the overall system is often ignored, even when ensemble forecasts are used to provide probabilistic predictions. Many of these model errors arise not because particular models are necessarily bad, but simply because the natural systems they are meant to simulate are far more complex than the models themselves. A better understanding of the impact of model error on different kinds of predictions, both deterministic and probabilistic, would help to quantify forecast uncertainty and the limits of predictability in different mathematical systems.

**Objective:** This initiative will develop theory and methods to characterize the inherent uncertainty in numerical model predictions that arise directly from errors in the models themselves, to understand how model structure and dimensionality might limit the predictability of different variables, and to attempt to quantify the uncertainty and predictability of non-linear systems. The expected outcomes of the initiative will be a better understanding of the true uncertainty present in forecasts of various dynamic systems, a methodology for calculating the uncertainty that arises from the model error present in these systems, and an understanding of the limits to reducing this uncertainty.

**Research Concentration Areas:** Research areas relevant to this initiative include, but are not limited to: (1) explorations of the sensitivity of geophysical model predictions to their choices of physical parameterizations, spatial and temporal resolution, and perhaps non-incorporated processes, (2) theoretical development of methods that might quantify the structural stability of geophysical models, (3) the interplay between structural stability, irreducible uncertainty, and predictability in non-linear geophysical models, and (4) techniques to understand the limits of observational data to constrain models and the development of metrics that might be useful in quantifying the impact of data assimilation on any specific model of a non-linear dynamical system.

**Impact:** The Navy utilizes numerical models to predict the operational environment (ocean, air, littoral and riverine) on a variety of time scales in an effort to gain a tactical advantage. The environmental predictions are used to estimate sensor performance, adapt various naval systems to the environment, and deploy mobile sensing assets in critical areas. A better understanding of the uncertainty associated with these predictions is crucial to employing the forecasts in the desired manner. This initiative will build a framework for understanding when, where, and how environmental model predictions should be used by developing a methodology to understand and quantify different sources of error that is appropriate for estimating model fidelity and uncertainty.

## **FY2009 BRC Topic #2**

### **Elastomeric Polymer-by-Design to Protect the Warfighter against Traumatic Brain Injury by Diverting the Blast Induced Shock Waves from the Head**

**Background:** Marines and soldiers are today surviving injuries caused by blast and projectiles (i.e. bullets and fragments) due to effective body armor, effective and timely evacuation, and advanced wound care. Exposure to blast-induced pressure waves, however, can result in Traumatic Brain Injury (TBI) even in the absence of visible effects and tissue damage. Shock waves are a major cause of TBI because they cause combined pressure/shear stress components (mechanical forces) that are responsible for neural damage in the brain. Elastomeric polymers can dissipate and divert shock pressure due to their unique mechanical properties under high rate loading conditions. Polymers can be engineered and synthesized for specific properties of energy dissipation and have the potential to be integrated into the helmet to dramatically reduce the incidents of TBI.

**Objective:** The goals of this project are: (1) to understand the relationship between polymer structure/morphology and blast energy dissipation mechanisms; (2) to harness this knowledge so that new polymers with optimal properties for shock loading can be designed, synthesized and tested; (3) to understand the mechanics of the polymer/helmet system in diverting the blast induced shock waves away

from the head. The awardees will develop an understanding, from the molecular level to the continuum level, of elastomer energy dissipation mechanisms associated with a blast wave consisting of broad-band frequencies for neat, filled, and composite elastomers, alone and as a part of a helmet system.

**Research Concentration Areas:** The participating research areas include, but are not limited to: polymer theory, molecular simulations, computer-aided materials design, elastomer synthesis and formulation, and materials testing and characterization. The awardees will develop or implement theory/computation along with experiment to understand the science of shock wave energy dissipation in neat and filled elastomeric polymers. In addition, the program will focus on morphology characterization, assessment of dynamic mechanical behavior and nonlinear dynamic simulation of the multi (helmet/elastomer/head) system. It is recognized that the active polymeric material, as part of a helmet, may need to reflect, scatter, dissipate and/or guide components of the pressure wave. Therefore the awardees will develop, and validate through experimentation, a theory for polymer/helmet interaction to divert the shock waves from the head and provide the necessary energy dissipation mechanism using optimization methods of complex systems. This effort should not duplicate an existing effort by ARO/JIEDDO, but instead should use models developed under the ARO/JIEDDO TBI program (highly detailed head/brain models, viscoelastic properties of brain tissue and brain cells damage mechanisms and thresholds of injury) in the analysis for optimization of polymer-based protection system (see references 1, 2 below).

Research concentration areas include:

- Theory, molecular simulation, computer-aided materials design
- Polymer synthesis, polymer formulation and characterization
- Dynamic mechanical analysis and other characterization methods of polymer dynamics
- High rate loading, constitutive modeling of the polymer, nonlinear dynamic simulation of the multi-system (helmet/elastomer/head), and shock tube testing

*We encourage teaming and anticipate one large award (~\$1M/yr. for a period of 4 years), as well as several individual investigator programs. Individual PIs are welcome to submit proposals that cover only one or more than one component of the overall research program. The total program funding will be \$6M, plus equipment/instrumentation.*

References 3-4 are provided for guidance only.

**Impact:** This research will provide a theoretical basis for understanding how energy dissipates when polymeric materials are subjected to high rate loadings as found in multi-frequency blast waves. A generalized set of rules and/or guidelines for the design of new materials under extreme pressure waves will be developed so that polymers can be engineered and synthesized for specific uses to reduce the incidents of TBI.

#### References:

1. Nyein, N., Jérusalem, A. and Radovitzky, R., Massachusetts Institute of Technology; D. Moore, Walter Reed Army Medical Center; L. Noels, University of Liege. Proceedings of the 26th Army Science Conference, Orlando, Florida, November 2008  
<http://www.asc2008.com/manuscripts/F/FO-04.pdf> .
2. Moore, D. F., Radovitzky, R., Shupenko, L., Klinoff, A., Jaffee, M.S. and Rosen, J.M. "Blast Physics and Central Nervous System Injury". Future Neurology, *Annals of Neurology*, 64:S30, 2008 accepted, 2008.
3. Computer-Aided Molecular Design, Charles H. Reynolds, M. Katharine Holloway and Harold K. Cox, Eds., ACS Symposium Series 589. American Chemical Society, Washington DC, 1995.
4. Roland, C.M., Twigg, J.N., Vu, Y. and Mott, P.H. "High Strain Rate Mechanical Behavior of Polyurea", *Polymer* 48 574 (2007).

## FY2009 BRC Topic #3

### DNA-based Molecular-scale Nanofabrication

**Background:** For over a decade, scientists have been studying bottom-up approaches to nanofabrication, namely starting with the smallest functional unit or device and utilizing various self-assembly techniques to build up larger circuits and systems. To this end, DNA based self-assembly methods have played a prominent role due to the unique molecular recognition properties of DNA, and the capability to chemically synthesize short DNA molecules of specified sequence. In recent years, DNA self-assembled structures have progressed from simple DNA branched motif building blocks known as tiles, to two-dimensional (2D) periodic lattices, to arbitrary 2D shapes, and even some interesting three-dimensional (3D) structures. In 2006, building on previous advances in DNA scaffold self-assembly, Rothemund succeeded in devising a general and versatile method, termed DNA origami, to fold long single stranded DNA molecules into arbitrary two-dimensional shapes. Furthermore, additional DNA strands could be attached to the 2D “canvas” to create secondary patterns with a mere 6 nm spatial resolution, i.e. arbitrary 2D patterns with ~ 6nm x 6nm “pixel” size. DNA origami is quick to implement and cost effective, due to the rapidly expanding biotechnology industry. These and other related recent advances indicate that “structural” DNA nanotechnology is now relatively mature, and it is time to examine carefully the “functional” side of DNA nanotechnology.

**Objective:** The program seeks to exploit the extraordinary combination of resolution, throughput, and flexibility of DNA nanotechnology to build functional electronic and computational devices and systems.

**Research Concentration Areas:** The research areas include, but are not limited to: (1) exploration of electronic and computational functionalities in DNA nanostructures, both in the sequence and through functionalization; (2) methods to build larger structures (both 2D and 3D) beyond the current size limit of DNA origami (roughly 100nm X 100nm); and (3) means to integrate DNA nanostructures with existing technology, such as attaching DNA nanostructures to semiconductor substrates.

**Impact:** Low power, light weight electronic components are desirable in many areas of naval warfare. For example, individual marines and SEALs could use low power devices to reduce weight load (batteries) while enhancing their capabilities for situational awareness, communication to command centers, or saving lives. Also, UAV/UGV/UUV are becoming increasingly power and weight conscious while the demand for intelligent electronic equipment increases. Nanotechnology has the potential to meet the future needs of warfighters by drastically reducing power consumption and weight load requirements. Cost effective nanofabrication and manufacturing techniques will be key to unleashing these potentials and making nanotechnology a reality for a wide array of future naval applications.

Proposals will be accepted from a single investigator or from a team of university or industry investigators. Proposals from a team of university or industry investigators must name one Principal Investigator as the responsible technical point of contact. Similarly, one institution will be the primary awardee for the purpose of award execution. The relationship among participating institutions and their respective roles, as well as the apportionment of funds including sub-awards, if any, must be described in both the proposal text and the budget.

## 7. Point(s) of Contact

One or more BRC Topic Chiefs are identified below for each specific BRC Topic. Also, questions of a technical nature should be directed to one of the BRC Topic Chiefs:

### **BRC Topic Chiefs – Topic # 1**

Scott Harper, ONR 322, (703) 696-4721, [Scott.L.Harper@navy.mil](mailto:Scott.L.Harper@navy.mil);

Reza Malek-Madani, ONR 311, (703) 696-0195, [Reza.MalekMadani@navy.mil](mailto:Reza.MalekMadani@navy.mil);

Manuel Fiadeiro, ONR 322, (703) 696-4441, [Manny.Fiadeiro@navy.mil](mailto:Manny.Fiadeiro@navy.mil)

### **BRC Topic Chiefs – Topic # 2**

Dr. Roshdy G. S. Barsoum, ONR 331, (703) 696-4306, [Roshdy.Barsoum@navy.mil](mailto:Roshdy.Barsoum@navy.mil)

### **BRC Topic Chiefs – Topic # 3**

Dr. Chagaan Baatar, ONR Code 312, (703) 696-0483, [chagaan.baatar@navy.mil](mailto:chagaan.baatar@navy.mil);

Dr. Laura Kienker, ONR Code 341, (703)-696-4054, [laura.kienker@navy.mil](mailto:laura.kienker@navy.mil)

Questions of a technical nature should be submitted to:

Dr. Bill Lukens  
BRC Program Manager, Code 03R  
Email Address: [william.lukens1@navy.mil](mailto:william.lukens1@navy.mil)

Questions of a *business nature* should be submitted to:

Primary

Kenesha Y. Hargrave, Contract Specialist  
Contract and Grants Awards Management, Code ONR 0251  
Office of Naval Research  
875 North Randolph Street, Suite  
Arlington, VA 22203-1995  
E-Mail: [kenesha.y.hargrave@navy.mil](mailto:kenesha.y.hargrave@navy.mil)

Secondary

Vera M. Carroll  
Acquisition Branch Head  
Contract and Grants Awards Management, Code 0251  
Office of Naval Research  
875 North Randolph Street, Suite 1279  
Arlington VA, 22203-1995  
E-mail: [Vera.Carroll@navy.mil](mailto:Vera.Carroll@navy.mil)

- ♦ All questions shall be submitted in writing by electronic mail (e-mail).
- ♦ Questions presented by telephone call, fax message, or other means will not be responded to.

- ◆ Questions regarding **white papers** should be submitted by **17 April 2009**. Questions received after this date may not be answered, and the due date for submission of the white papers may not be extended.
- ◆ Questions regarding **full proposals** should be submitted by **9 June 2009**. Questions after this date may not be answered, and the due date for submission of the proposals will not be extended.

## **8. Instrument Type(s)**

All awards resulting from this announcement will be grants to universities and industry.

## **9. Catalog of Federal Domestic Assistance (CFDA) Numbers**

CFDA Number: 12.300

## **10. Catalog of Federal Domestic Assistance (CFDA) Titles**

CFDA Title: DoD Basic and Applied Scientific Research

## **II. AWARD INFORMATION**

The awards will be made at funding levels commensurate with the proposed research and in response to agency missions. Each individual award will be for a four year period. The award will be incrementally funded.

Total amount of funding for four years for grants resulting from this BAA is estimated to be about \$18M, subject to the availability of out-year appropriations. It is anticipated that the maximum award will be \$1.5M per year. It is recommended that potential proposers communicate with the BRC Topic Chiefs regarding these issues before the submission of formal proposals.

There is no guarantee that any of the proposals submitted in response to a particular topic will be recommended for funding. On the other hand, more than one proposal may be recommended for funding for a particular topic.

## **III. ELIGIBILITY INFORMATION**

All responsible sources from academia and industry may submit proposals under this BAA. Historically Black Colleges and Universities (HBCUs) and Minority Institutions (MIs) are encouraged to submit proposals and join others in submitting proposals. However, no portion of this BAA will be set aside for HBCU and MI participation.

Federally Funded Research & Development Centers (FFRDCs), including Department of Energy National Laboratories, are not eligible to receive awards under this BAA. However, teaming arrangements between FFRDCs and eligible principal bidders are allowed so long as they are permitted under the sponsoring agreement between the Government and the specific FFRDC.

Navy laboratories and warfare centers as well as other Department of Defense and civilian agency laboratories are also not eligible to receive awards under this BAA and should not directly submit either white papers or full proposals in response to this BAA. If any such organization is interested in one or more of the topics described herein, the organization should contact the appropriate ONR BRC Topic Chief to discuss its area of interest. As with FFRDCs, these types of federal organizations may team with other responsible sources from academia and industry that are submitting proposals under this BAA.

Teams are encouraged to submit proposals in any and all of the topic areas. However, Offerors must be willing to cooperate and exchange software, data and other information in an integrated program with other contractors, as well as with system integrators, selected by ONR.

#### **IV. APPLICATION AND SUBMISSION INFORMATION**

##### **1. Application and Submission Process**

The proposal submission process is in two stages. Prospective awardees are encouraged to submit white papers to minimize the labor and cost associated with the production of detailed full proposals that have little chance of being selected for funding. Based on an assessment of the white papers, the responsible BRC Topic Chief(s) will provide informal feedback notification to the prospective awardees which may help them to decide whether to submit full proposals.

Feedback may not be provided on white papers arriving after the deadline. However, full proposals may be submitted regardless whether a white paper was submitted and regardless whether a white paper was judged to be of "particular value" to the Navy.

##### **2. Content and Format of White Papers**

White papers submitted under this BAA are expected to address unclassified basic research. Proposers are expected to appropriately mark each page of their submission that contains proprietary information. Grants awarded under this announcement will be unclassified.

White paper format:

- Paper Size - 8.5 x 11 inch paper
- Margins - 1 inch
- Spacing - single
- Font - Times New Roman, 12 point
- Number of Pages - no more than four (4) single-sided pages (excluding cover letter, cover page and curriculum vitae). White papers exceeding the page limit may not be evaluated.

White Paper content should be as follows:

- A one page cover letter (optional)
- A cover page, labeled "PROPOSAL WHITE PAPER," that includes the BAA number, proposal title, and proposer's technical point of contact, with telephone number, facsimile number, e-mail address, topic number, and topic title
- Identification of the research and issues
- Proposed technical approaches
- Potential impact on DoN capabilities
- Potential team and management plan
- Summary of estimated costs
- Curriculum vitae of key investigators

Number of Copies – one (1) original and two (2) copies.

##### **3. Content and Format of Full Proposals**

Full proposals submitted under this BAA are expected to address unclassified, non-export controlled basic research. The full proposal submissions will be protected from unauthorized disclosure in



accordance with FAR 15.207, entitled, "Handling Proposals and Information", applicable law, and DoD regulations. Proposers are expected to appropriately mark each page of their submission that contains proprietary information. Grants awarded under this announcement will be unclassified. Full proposals must be submitted electronically through grants.gov.

**NOTE:** Full Proposals sent by fax, United States Postal Service, commercial carrier, hand delivered, or e-mail will not be considered.

### **Mandatory Form SF 424 (R&R)**

Complete this mandatory form first to populate data in other forms. Complete all the required fields in accordance with the pop-up instructions on the form. To activate the instructions, turn on the "Help Mode" (icon with the pointer and question mark at the top of the form). The list of certifications and assurances referenced in Field 18 can be found on the ONR Home Page at Contracts and Grants. The certification package for grants is entitled, "Certifications for Grants and Agreements." The completion of most of the fields is self-explanatory except the following special instructions:

- a. Field 2: In the Applicant Identifier area, please list the appropriate Topic Chief(s) to receive the proposal.
- b. Field 4: In the Federal Identifier Field, (Field 4) designate "BRC", Department Code and name of the BRC Topic Chief. For example for Topic 1, Field 4 should read.BRC – Code 322 - Harper
- c. Field 7: Complete as indicated. Please note under "Other (Specify)" if your organization is a Minority Institution (MI).
- d. Field 18: The List of Certifications and Assurances referenced in Field 18 can be found on the ONR Home Page, ([www.onr.navy.mil](http://www.onr.navy.mil)), select "BAAs", then select Representatives and Certifications". The certification package for Grants is entitled, "Certifications for Grants and Agreements".
- e. Field 20: "Pre-Application" Use Field 20 to attach the entire technical and cost proposal scanned into a single pdf file.

**The following information should be included in the proposal package. The entire proposal package including the technical and cost proposal should be scanned into a single pdf file and attached to the SF 424 (R&R) Form at Field number 20 entitled "Pre-Application"**

Proposal Narrative - The proposal narrative contains the cover, table of contents, executive summary, background, statement of work, management approach, list of references, assertion of data rights, qualifications and cost proposal. The entire proposal narrative must be contained in the single pdf file attached at Field 20 entitled, "Pre-Application".

### Project Summary/Abstract

The project summary should be a single page that identifies the research problem, technical approaches, anticipated outcome of the research, if successful, and impact on DoN capabilities. It should identify the Principal Investigator, the university and other universities involved in the BRC team if any, the proposal title, the agency to which the proposal is submitted, the BRC topic number and the total funds requested from DoN for the four year period. The project summary must not exceed 1 page when printed using standard 8.5" by 11" paper with 1-inch margins (top, bottom, left and right) with font Times New Roman, 12 point.

### The Following Formatting Rules Apply for the Proposal Narrative

- Paper size when printed - 8.5 x 11 inch paper
- Margins - 1 inch
- Spacing -single

- Font - Times New Roman, 12 point
- Number of pages - no more than twenty-five (25) single-sided pages.  
The cover, table of contents, list of references, and curriculum vitae are excluded from the page limitations. Full proposals exceeding the page limit may not be evaluated.

Include the Following Information in the Proposal Narrative

The first page of your narrative must include the following information:

- Principal Investigator's name
- Phone number, fax number and e-mail address
- Institution, Department, Division
- Institution address
- Other universities and entities involved in the BRC team
- Current Department of Defense Contractor or Grantee? If yes, provide for each current agreement: Agency name, project title, period of performance, agreement value, agency point of contact and phone number
- Current Proposal title
- Institution proposal number
- BRC topic title
- Table of Contents: List project narrative sections and corresponding page numbers.
- Statement of Work: A Statement of Work (SOW) clearly detailing the scope and objectives of the effort. It is anticipated that the proposed SOW will be incorporated as an attachment to any resultant award instrument. To this end, this project narrative must include a severable self-standing SOW, without any proprietary restrictions, which can be attached to a grant award.
- Technical Approach: Describe in detail the basic science and/or engineering research to be undertaken. State the objective and approach, including how data will be analyzed and interpreted. Discuss the relationship of the proposed research to the state-of-the-art knowledge in the field and to related efforts in programs elsewhere. Include appropriate literature citations/references. Discuss the nature of expected results. Discuss potential applications to defense missions and requirements.
- Project Schedule, Milestones and Deliverables: A summary of the schedule of events, milestones, and a detailed description of the results and products to be delivered.
- Management Approach: A discussion of the overall approach to the management of this effort, including brief discussions of: required facilities; relationships with any subawardees and with other organizations; availability of personnel; and planning, scheduling and control procedures.
  - (a) Describe the facilities available for the accomplishment of the proposed research objectives. Describe any capital equipment planned for acquisition under this program and its application to the proposed research. If possible, the budget for capital equipment should be allocated to the first budget period of the grant. Include a description of any government-furnished equipment/hardware/software/information, by version and/or configuration that are required for the proposed effort.
  - (b) Describe in detail proposed subawards to other eligible universities or relevant collaborations (planned or in place) with government organizations, industry, or other appropriate institutions. Particularly describe how

collaborations are expected to facilitate the transition of research results to applications. Descriptions of industrial collaborations should explain how the proposed research will impact the company's research and/or product development activities. If subawards to other universities are proposed, make clear the division of research activities to be supported by detailed budgets for the proposed subawards.

(c) Designate one individual as the Principal Investigator for the award, for the purpose of technical responsibility and to serve as the primary point of contact with ONR's relevant BRC Topic Chief. Briefly summarize the qualifications of the Principal Investigator and other key investigators to conduct the proposed research.

(d) Describe the research activities of the Principal Investigator and any co-investigators in on-going and pending research projects, whether or not acting as Principal Investigator in these other projects, the time charged to each of these projects, and their relationship to the proposed effort.

(e) If proposal includes a team, describe plans to manage the interactions among the members of the research team.

(f) Identify other parties to whom the proposal has been, or will be sent, for possible funding, including agency contact information.

- List of References: List any publications cited in the above sections.
- Curriculum Vitae: Include curriculum vitae of the Principal Investigator and any key co-investigators.

### Cost Proposal

Provide a detailed 4-year budget proposal showing a cost breakdown of all costs by cost category and by the funding periods described below:

The budget should adhere to the following guidelines:

Detailed breakdown of all costs, by cost category, by the calendar periods stated below. For budget purposes, use an award start date of 09 August 2009. The cost should be broken down to reflect funding increment periods of:

- (1) Two months (09 August 09 to 30 Sep 09),
- (2) Twelve months (01 Oct 09 to 30 Sep 10),
- (3) Twelve months (01 Oct 10 to 30 Sep 11),
- (4) Twelve months (01 Oct 11 to 30 Sep 12), and
- (5) Ten months (01 Oct 12 to 08 August 13).

### Submission of White Papers:

White papers must be submitted directly to the BRC Topic Chief(s) via one of the following methods:

1. Via e-mail submitted directly to the BRC Topic Chief(s);
2. Via the United States Postal Service (USPS),
3. Via a commercial carrier; or
4. Hand delivered to the attention of the responsible BRC Topic Chief(s) identified in Section VIII entitled, "Specific BRC Topics".

For white paper submissions including hand delivery, use the topic address stated below:

4. Address for the Submission of White Papers

For Topic (1), the address is:

Office of Naval Research  
ATTN: Dr. Scott Harper, Code 322  
875 North Randolph Street - Suite 1085  
Arlington, VA 22203  
E-mail for white papers only: Scott.L.Harper@navy.mil

For Topic (2), the address is:

Office of Naval Research  
ATTN: Dr. Roshdy Barsoum, Code 331  
875 North Randolph Street - Suite 631  
Arlington, VA 22203  
E-mail for white papers only: roshdy.barsoum@navy.mil

For Topic (3), the address is:

Office of Naval Research  
ATTN: Dr. Chagaan Baatar, Code 312  
875 North Randolph Street - Suite 913  
Arlington, VA 22203  
E-mail for white papers only: chagaan.baatar@navy.mil

If for some reason hand an offeror cannot contact the specific BRC topic chiefs, delivery can be made to one of the other listed topic chiefs or to:

Dr. Bill Lukens  
Code 03R, BRC Program Manager  
Office of Naval Research  
875 North Randolph Street – Suite 256A  
Arlington, VA 22203-1995  
Email Address: [william.lukens1@navy.mil](mailto:william.lukens1@navy.mil)

**Submission of Grant Proposals through Grants.gov**

(NOT APPLICABLE TO PROPOSALS FOR CONTRACTS AND OTHER TRANSACTION AGREEMENTS)

Detailed instructions entitled “Grants.Gov Electronic Application and Submission Information” on how to submit a Grant or Cooperative Agreement proposal through Grants.gov are under the Acquisition Department — Submitting a Proposal section of the website at [http://www.onr.navy.mil/02/docs/FY09\\_GrantsGovApp\\_and\\_Submission\\_Information.pdf](http://www.onr.navy.mil/02/docs/FY09_GrantsGovApp_and_Submission_Information.pdf).

Grant and cooperative agreement proposals shall be submitted through [Grants.gov](http://Grants.gov) using the mandatory Grants.gov form(s) from the application package template associated with the BAA on the Grants.gov website. The use of the optional forms from the application package template associated with the BAA is highly encouraged. To be considered for award, applicants must include the ONR Department Code in Block 4 entitled ‘Federal Identifier’ of the Standard Form (SF) 424 R&R. Enter the cognizant the

Department Code that best relates to your proposal in Block 4 (Federal Identifier) of the SF 424 R&R to ensure that it is properly routed to the correct Program Office. Only one Department Code may be selected. Choose at the sub-Department level wherever possible (i.e., for parent ONR Code 30, you should select at the 301, 302 or 303 level if possible). A list of the Department Codes can be found at <http://www.onr.navy.mil/> on the right side of the screen. If there is a specific ONR Program Officer to whom you wish to direct the proposal, enter the Department Code followed by the Program Officer's name. Applicants who fail to provide a Department Code identifier may receive notification that their proposal submission has been rejected.

White Papers (pre-proposals) should not be submitted through the Grants.gov Apply process but rather should be sent directly to ONR. White paper submissions should be emailed directly to the appropriate ONR Program Officer.

By completing Blocks 18 and 19 the Grant Applicant is providing the certification on lobbying required by 32 CFR Part 28. Refer to Section VI, 'Award Administration Information' entitled "Certifications" for further information.

For electronic submission of grant and cooperative agreement full proposals, there are several one-time actions that must be completed in order to submit an application through Grants.gov. These include obtaining a Dun and Bradstreet Data Universal Numbering System (DUNS) number, registering with the Central Contract Registry (CCR), registering with the credential provider, and registering with Grants.gov. See [www.grants.gov](http://www.grants.gov), specifically [www.grants.gov/GetStarted](http://www.grants.gov/GetStarted).

Use the Grants.gov Organization Registration Checklist at [http://www.grants.gov/applicants/register\\_your\\_organization.jsp](http://www.grants.gov/applicants/register_your_organization.jsp) which will provide guidance through the process. Designating an E-Business Point of Contact (EBiz POC) and obtaining a special password called 'MPIN' are important steps in the CCR registration process. Applicants who are not registered with CCR and Grants.gov should allow at least 21 days to complete these requirements. The process should be started as soon as possible. **All attachments to grant applications submitted through Grants.Gov must be in Adobe Portable Document Format. Proposals with attachments submitted in word processing, spreadsheet, or any format other than Adobe Portable Document Format will not be considered for award.** Any questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or [support@grants.gov](mailto:support@grants.gov).

#### Special Notices Relative to Grant Applications to be submitted through Grants.Gov:

Process to Obtain a Waiver from the Use of Grants.Gov for Submission of Full Grant Proposals: If a prospective grantee is unable to comply with the requirement to use Grants.Gov "APPLY" for submission of a grant or cooperative agreement application under this BAA or finds it would be an excessive burden to comply with this requirement, a waiver request may be submitted not less than 30 calendar days prior to the closing date for receipt of Full Proposals. Such request should be submitted by the Electronic Business Point of Contact listed in the CCR for the organization and should contain the Organization/Individual's name, address, telephone number, and email address. The request should state the reason for the request in sufficient detail so a decision can be made. The Waiver Request should be submitted to the ONR Acquisition Department point of contact or Grants Officer listed in the BAA. Such request can be sent by registered mail or email. The "postmark" stamp on the envelope or the time annotated on the email will be used to determine timeliness of the request. A decision and response will be issued within 14 calendar days of receipt of the request by ONR. Foreign Grantees who are not registered in CCR may request a waiver on that basis since CCR registration is integral to the Grants.Gov application process.

#### **4. Significant Dates and Times**

<b>Schedule of Events</b>		
<b>Event</b>	<b>Date</b>	<b>Time</b>
White Papers Due	17 April 2009	4:00 PM Eastern Standard Time
Notification of Initial DoD Evaluations of White Papers	13 May 2009*	
Full Proposals Due	9 June 2009	4:00 PM Eastern Daylight Time
Notification of Selection for Award	14 July 2009*	
Start Date of Grant	09 August 2009*	

\* These dates are estimates as of the date of this announcement.

## **5. Submission of Late Proposals**

Any proposal submitted through Grants.gov after the deadline for proposal submission will be late and will not be evaluated unless the Grants.gov website was not operational on the due date and was unable to receive the proposal submission. If this occurs, the time specified for the receipt of proposals through Grants.gov will be extended to the same time of the day specified in this BAA on the first workday on which the Grants.gov website is operational.

## **V. EVALUATION INFORMATION**

### **1. Evaluation Criteria**

White papers will be evaluated by the responsible BRC Topic Chief to assess whether the proposed research is likely to meet the objectives of the specific topic, and thus whether to encourage the submission of a full proposal. The assessment will focus on scientific and technical merit (criterion 1, below) and relevance and potential contribution to Department of the Navy (DoN) (criterion 2, below).

Full proposals responding to this BAA in each topic area will be evaluated using the following five criteria. The first two evaluation factors are of equal importance:

- (1) scientific and technical merits of the proposed basic science and/or engineering research;
- (2) relevance and potential contributions of the proposed research to the topical research area and to DoN missions.

The following three evaluation criteria are each of lesser importance than either of the above two, but are equal to each other:

- (3) the qualifications and availability of the Principal Investigator and any key co-investigators;
- (4) the adequacy of current or planned facilities and equipment to accomplish the research

objectives; and

(5) the realism and reasonableness of cost (cost sharing is not a factor in the evaluation).

## **2. Evaluation Panel**

White papers will be reviewed either solely by the responsible BRC Topic Chiefs for the specific topic or by an evaluation panel chaired by the responsible BRC Topic Chiefs. An evaluation panel will consist of technical experts who are Government employees.

Full proposals will be evaluated by an evaluation panel chaired by the responsible BRC Topic Chiefs for the particular topic and will consist of technical experts who are Government employees. Evaluation panel members are required to sign "no conflict of interest" statements.

Technical and cost proposals submitted under this BAA will be protected from unauthorized disclosure in accordance with FAR 3.104-4 and 15.207. The cognizant Program Officer and other Government scientific experts will perform the evaluation of technical proposals. Cost proposals will be evaluated by Government business professionals. Restrictive notices notwithstanding, one or more support contractors may be utilized as subject-matter-expert technical consultants. Similarly, support contractors may be utilized to evaluate cost proposals. However, proposal selection and award decisions are solely the responsibility of Government personnel. Each support contractor's employee having access to technical and cost proposals submitted in response to this BAA will be required to sign a non-disclosure statement prior to receipt of any proposal submissions.

## **VI. AWARD ADMINISTRATION INFORMATION**

### **1. Administrative Requirements**

- CCR - Successful proposers not already registered in the Central Contractor Registry (CCR) will be required to register in CCR prior to award of any grant. Information on CCR registration is available at <http://www.onr.navy.mil/02/ccr.htm>.
- Certifications - The following certification applies to each grant applicant seeking federal funds exceeding \$100,000:

#### **Certification Regarding Lobbying Activities**

(1) No Federal appropriated funds have been paid or will be paid by or on behalf of the applicant, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the Federal contract, grant, loan, or cooperative agreement, the applicant shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The applicant shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, title 31, U.S.C. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Grants and Cooperative Agreements not through Grants.gov:

Proposers seeking grants or cooperative agreements who have received Grants.gov waiver approval for awards greater than \$100,000 shall complete and submit electronic representations and certifications at the Contracts and Grants Section of the ONR Home Page at [http://www.onr.navy.mil/02/rep\\_cert.asp](http://www.onr.navy.mil/02/rep_cert.asp) .

## **2. Reporting**

In general, for each grant award, annual reports and a final report are required summarizing the technical progress and accomplishments during the performance period, as well as any other reports as requested by the BRC Topic Chief.

## **VII. OTHER INFORMATION**

### **1. Government Property/Government Furnished Equipment (GFE) and Facilities**

Each proposer must provide a specific description of any equipment/hardware that each participating institution needs to acquire to perform the work. This description should identify the component, nomenclature, and configuration of the equipment/hardware that it proposes to purchase for this effort. The purchase on a direct reimbursement basis of special test equipment or other equipment that is not included in a deliverable item will be evaluated for allowability on a case-by-case basis. Maximum use of Government integration, test, and experiment facilities is encouraged in each of the proposer's proposals.

Government research facilities and operational military units are available and should be considered as potential Government furnished equipment/facilities. These facilities and resources are of high value and some are in constant demand by multiple programs. It is unlikely that all facilities would be used for the BRC program. The use of these facilities and resources will be negotiated as the program unfolds. Proposers should explain which of these facilities they recommend.

### **2. Use of Animals and Human Subjects in Research**

If animals are to be utilized in the research effort proposed, the Offeror must complete a DOD Animal Use Protocol with supporting documentation (copies of AALAC accreditation and/or NIH assurance, IACUC approval, research literature database searches, and the two most recent USDA inspection reports) prior to award. For assistance with submission of animal research related documentation, contact the ONR Animal/Human Use Administrator at (703) 696-4046.

Similarly, for any proposal for research involving human subjects the Offeror must submit prior to award: documentation of approval from an Institutional Review Board (IRB); IRB-approved research protocol; IRB-approved informed consent form; proof of completed human research training (e.g., training certificate or institutional verification of training); an application for a DoD Navy Addendum to the Offeror's DHHS-issued Federalwide Assurance (FWA) or the Offeror's DoD Navy Addendum number. In the event that an exemption criterion under 32 CFR.219.101(b) is claimed, provide documentation of the determination by the Institutional Review Board (IRB) Chair, IRB Vice Chair, designated IRB administrator or official of the human research protection program. Information about assurance applications and forms can be obtained by



contacting ONR\_343\_contact@navy.mil . If the research is determined by the IRB to be greater than minimal risk, the Offeror also must provide the name and contact information for the independent medical monitor. [Note: for research involving human subjects that is greater than minimal risk, administrative procedures to protect human subjects from medical expenses (not otherwise provided or reimbursed) that are the direct result of participation in a research project must be addressed. Additional supporting documentation may be requested. For additional information on this topic, email ONR\_343\_contact@navy.mil.] For assistance with submission of human subject research related documentation, contact the ONR Animal/Human Use Administrator at (703) 696-4046.

### **3. Department of Defense High Performance Computing Program**

The DoD High Performance Computing Program (HPCMP) furnishes the DoD S&T and DT&E communities with use-access to very powerful high performance computing systems. Awardees of ONR contracts, grants, and assistance instruments may be eligible to use HPCMP assets in support of their funded activities if ONR Program Officer approval is obtained and if security/screening requirements are favorably completed. Additional information and an application may be found at <http://www.hpcmo.hpc.mil/>.