

VBFF Webinar – 07/20/2020 – Full Transcript of Presentation

Jean-Luc Cambier:

Welcome to a new edition of the VBFF Webinar, for Fiscal Year 21. Before I start, I will hand off the microphone to Dr. Bindu Nair who is the Director of the Basic Research Office (BRO), who may want to say a few words. Bindu?

Bindu Nair:

Our job in our office is to oversee the Department's investment in basic research. Some of you have various awards and grants from different parts of the basic research enterprise, and that's great. We are here today to talk about the Vannevar Bush Fellowship, which is an OSD-owned program. Our office mostly oversees the DoD's early or basic research funding out of the services, out of DARPA, out of DTRA, etc, but there's a little bit of the budget that we hold for ourselves, and one of the things that we like to do with it, is the Vannevar Bush Faculty Fellowship. This is an important program for us; what we try to do here is to say: "Give us your really high-risk ideas, for which you don't know whether you would have the freedom and ability to work on in other programs. If you really have some ideas that you believe would change the direction that your field is going in, that's what we want to hear about." If so, we want to get to know you. I also encourage you to talk to current Fellows, or past Fellows, because the idea here is that you enter this group of researchers (which we call fellows), and we reach out to you and ask you to help guide us. In return, we let you try out some things that perhaps might not be feasible in a standard grant. So, thank you for your interest in the program. Jean-Luc will walk you through the fellowship and the program, and we will be happy to answer questions as they come up. We hope you find that this type of "blue sky" program opportunity will let you bring in ideas that we do not have right now into the DoD. Basic research is highly important to us – always has been, and we look forward to seeing what this new class is going to bring forward for us. So with that, let me turn it back over to Jean-Luc.

Jean-Luc Cambier:

Slide 2: Thank you, Bindu. Slide 2 is a rough agenda; we will try to leave enough time for Q&A at the end. I will remind you that we are recording the session, so that people who cannot attend will be able to learn about the program. Please mute your microphone and hold your questions to the end of the session.

Slide 3: This program is named after Vannevar Bush. You may be familiar with him, and appreciate that he was a formidable person. He instigated the creation of NSF, was a professor and Dean of Engineering at MIT, and played a critical role during WW2 in advancing the technology that helped us win the war. He was also the author of an article, called "Science: The Endless Frontier", where he strongly advocated for the need to do basic research. This is basically a person who straddled two areas: he was a promoter

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of basic research for the benefit of the nation, and he was also a promoter of national defense and that is why this program is really a good fit to his ideals, and why this is called the Vannevar Bush fellowship.

Slide 4: The program team: you just heard from Dr. Nair, who is the Director of the Basic Research Office. I am Jean-Luc Cambier, the program officer. Dr. Williams is the program manager at ONR and is in charge of managing the grant. We also have help from IDA, via Dr. Mike Finnin who is also online. I also get support from Dr. Fatunmbi, and both of our emails are on the slide. I put both up there so that if you have any questions, you can contact me or Dr. Fatunmbi.

Slide 5: The program is now officially announced and online, on grants.gov, on the ONR website, and on the registration website, AcquTrak. I would encourage you to read the Federal Opportunity Announcement (FOA), very carefully because it contains a lot of information. I will try to go through the most important parts right now, but there is a lot of information in the FOA, so please read it carefully.

Slide 6: The program started in 2008, it was under a different name and a rather long acronym. It ran from a different office and eventually moved into the Basic Research Office, in 2014. We eventually changed the name, and the sponsor as you heard from by Dr. Nair. ONR manages the grants, so all the technical direction comes from OSD, and ONR is basically in charge of processing the paperwork and the award, and then the financial aspects of it. It is important to realize that Vannevar Bush is really unique; it is the largest single-investigator program within the Department of Defense, and I will go through the specific characteristics of the program.

Slide 7: Here are some basic grants information. Who is eligible? Tenured faculty and full-time research staff. Currently, you must be tenured at the time of application, which means at the time you submit your white paper. Although it is a single-investigator grant, you can have collaborators. This is a tricky part, and I will spend more time on that point later. It is open to U.S. citizens and permanent residents. You do not need a security clearance because it is basic research. If you are awarded the grant, you become a Fellow; as such, you are expected to participate in some DoD activities as part of the grant, such as attend workshops, or visits to the DoD labs. You must attend a program review each year. You may host scientists from the DoD labs, serve on advisory panels, and send students to lab internships...all those activities depend on the circumstances. Basically, we want to leverage your expertise and would like you to get involved with the DoD activities, and that may mean different things. You must have a strong willingness to help the DoD; it is part of the criteria of the fellowship. Last bit of information, there is about ten Fellows selected each time...this is an approximate number, depending on the submissions and funding.

Slide 8: Regarding past competitions, you can see here the program history, starting as the NSSEFF. It stopped for a while, between 2010 and 2014. It then moved to the BRO, changed names, and has been relatively stable since 2016, except that, as you can notice, the number of fellows seems to be decreasing. This is a reflection of the budget, but you can be sure that OSD values this program very much, and we try very hard to maintain the appropriate level of funding and awards we believe this program should be at.

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Slide 9. What is this program about? First and foremost, it is to support fundamental, curiosity-driven fundamental research. This is not aimed at research that is incremental. This is very open and far-reaching, what is called “blue-sky”. We also want to use this program to recruit and create the next generation of researchers that can support the entire DoD research enterprise. You have five years to do all of that. We also aspire to build relationships between the Fellows and the DoD. As I mentioned earlier, you may be called to serve on advisory boards, panels, etc. We rely a lot on the expertise of the VBFF Fellows. We also want to expose university researchers to the DoD problems. Very often, universities don’t fully appreciate the needs of DoD, or even the fact that DoD cares about basic research. This program is one specific example of an attempt to remedy the situation.

Slide 10. Let’s talk now about the process. It is actually very simple. You are the PI with a great idea, which you believe is the next best thing since sliced bread. You then write a white paper, you submit it as directed, and it is reviewed by a panel of experts. Out of that panel review and discussion, we send you an invitation, if you are successful, to write a full proposal. So, off you go and write a full proposal which you submit by the deadline. At the same time, and as a separate package, we need to obtain recommendation letters; three letters, no more. You choose who submits these recommendation letters, so please choose wisely, since this will be part of the evaluation criteria. The whole package is then reviewed again by the panel. The panel, in turn, makes a recommendation to the BRO on which proposal is deserving of an award. The panel recommendations are examined by the director, who makes the final selections. After which, if you are the winner, you can celebrate!

Slide 11: Some key points: the panels consist of technical experts within the DoD and other government agencies. These panels are built according to the areas of research interest described in the FOA, and typically consist of between 5 and 8 members which can vary from one panel to another, depending on the breadth of the topic. This means we have several panels providing their award recommendations, and that is also why at the end of the process, the director must look at all these, across the panels and the different research areas, to make a determination of the best candidates for an award. There may be some rare cases where we call for external reviewers outside of the government, we usually prefer to keep things inside the government; in such instances, the external reviewers will sign standard non-disclosure and conflict-of-interest forms. Some proposals can be reviewed by more than one panel. For example, you may have a multidisciplinary project that straddles two topic areas, in which case we will judge if this should be reviewed by two panels. We want to make sure we are not blindsided, and that you get the right experts to review your idea. The proposals must include a CV, a budget and three letters of recommendation which must be submitted separately, and you can find all that explained in the FOA. And as I mentioned, the Director has the final word on the selection.

Slide 12: Let’s talk about topics. These are the current topics, described at length in the FOA. Applied Math and Computational Science. Network Science and Artificial Intelligence. This does not necessarily imply a well-coupled area; it is, sort of, two subjects put together, but it does not mean they have to be combined. In other words, if you submit something on Artificial Intelligence, it does not need to involve Networks, although I would surmise that Intelligence would involve a network of sorts. The same way, if you submit something within Network Science, it doesn’t mean you have to have Artificial Intelligence in it. Next up is Cognitive Neuroscience. Bio-Science, i.e. the Foundations of Bio-Engineering – this one can

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also be a bit tricky to describe, because we want to make sure that this is something that the DoD is interested in as opposed to other agencies like the NIH. The topic description in the FOA tries to make that very clear. Then, there is Quantum Information and after that we have two broad topics on Materials – one is on Electronics, Photonics and Quantum Materials, and another one that is more aimed at structural aspects of materials, and this can also be a broad subject. Finally, since we cannot put everything into those bins, there is one that is called “Other” – other research fields which can pretty much be anything, as long as it has some DoD relevance. Of course, there might be something that might not fit well into these topics and be on the boundary, and that’s OK. You can submit those as well. However, you **must** select at least one of these topic areas, and if you are not sure, you can pick “Other”.

Slide 13: This is actually a common question, i.e. that the research can be in this topic, or that topic, etc. It can be fuzzy. As I said, you must pick a primary topic, and you can also select a secondary. If it is a perfect fit into one topic, you do not need to pick the second one. Now... you may think that if you pick two topics you would have better chances. No, you don’t. It does not matter at all. It is only an indication to the panels as to how to best review it. Another question is “does the research need to fit a topic description?” The answer is no. The topic description is broad enough to list a variety of things that we are interested in, but this is not supposed to be a limitation. You have to pick a topic, but you may have something that is totally new, and we welcome that, i.e. the fact that your idea is something we have not thought about and is not described. So what about the Other category? Is there a panel for that? It would seem very difficult, because there are so many subject areas, and that is correct. The Other panel is created on the spot from relevant subject matter experts, according to the scientific content of the white papers and proposals. In this case, some of these proposals may also be reviewed by existing members of the panels.

Slide 14: How do you become successful? The first question we ask is what kind of research is being proposed. I encourage you to read the FOA. There is a sentence in bold, which is repeated here: “VBFF is oriented towards bold and ambitious “blue sky” research that may lead to extraordinary outcomes, such as revolutionizing entire disciplines, creating new fields, or disrupting accepted theories and perspectives.” This is about very far-reaching ideas; out there. It is important to realize this is not a standard proposal you may be accustomed to, where you just make another step into a research direction, after a legacy of work. This is important to do, but here we are asking for something different. Here, you must be really reaching out – out of the comfort zone. Another key aspect you may be wondering about, is: what does it mean to be relevant to the DoD? Because this is basic research, we are not looking at anything specific; this is not designed to apply to a specific mission, platform or system. You have to think in the long term and use your imagination. Because we are looking far in the future, this should be research that is revolutionizing an entire viewpoint, or paradigm. You may want to imagine what warfare will look like in the future. Even if you are not sure how it can be used, that’s ok, but you must at least have thought about it, not just say something like: we will do research and we will see if the DoD will be interested in it...You must have thought about it and this must be evident in your proposal. Another question is whether the DoD is the right funding agency? That is important, especially for the biosciences because of the medical aspects and applications. Indeed, if other agencies

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are a better fit, the DoD may not be interested. You have to be careful and really think about the DoD being the right agency to fund the research. You must also have the proper qualifications and experience, which does not mean that you need existing contacts with the DoD – although it can help. We will ask only that you build this relationship, i.e., that you are willing to establish networks and connections within the DoD. You must also have the reputation of being one of the best in your field, with the help of your CV, publication list, and letters of recommendation.

Slide 15: In order to be successful, you must have an idea and also a plan. That includes the desire to work with the DoD and with its scientists; the idea must be of interest to DoD, and if you go past the white paper phase, all that must be explained in the proposal. Having a good plan on how to conduct the research, manage the risks, work with the DoD, really helps. You must also be willing to train a new generation of scientists – you must have a plan for that also. Finally, let us mention an important point. This is a single-investigator program, so do not say that you have a co-PI. You are the **only** PI. At the same time, collaborators are allowed, so you might think: “what’s the difference?” First of all, all of the ideas must come from you. You don’t rely on another investigator to supplement your creativity. You must plan and drive the research. It is your project. You must be in charge. You must then, obviously, have most of the funding. Now... you can have collaborators, but in that case they play a supporting role. It is really your project, and this has to come out of the proposal, very strongly.

Slide 16: This program is really unique for several reasons. It differs from other programs in the DoD in various aspects. Single investigator, same as the core grants from the services (AFOSR, ONR, ARO) but this is five years, and this is a much larger funding amount, so it makes a big difference. There is also the MURI program, but the MURIs have targeted topics, which change year to year. Here, we have a broad list of topics, and the subject of research is really entirely up to you. We’re calling on your creativity here. We also have other programs like DARPA and others with large funding amounts, but they address very specific technology problems and tend to be near-term – which is why they have milestones and deliverables. Here, we are looking for scientific breakthroughs, for which we cannot define milestones. There are also in-house research programs, where we provide funding to the DoD labs, but here, we want to build the next generation of researchers in academia. Finally, the UARCs are designed to maintain excellence in specific fields, while here, we are trying to refresh constantly and create new fields. Therefore, this program is unique.

Slide 17: Finally, the question may be: why don’t the services run the program? The answer is simple: OSD oversees all the basic research across the services and therefore that office has the capabilities and oversight necessary to identify wide needs across the DoD.

Slide 18: We talked about interactions between the Fellows and the DoD. If you become a Fellow, you obviously have to present your work – this is the role of the yearly program reviews; you may also serve on panels; we may call on you to review proposals; you may participate in workshops – we have a number of those; and you may collaborate with DoD researchers on joint projects. The latter is the other program that I mentioned earlier, called LUCI, where we provide grants to the DoD Lab scientist, so they can partner and collaborate with one of you. This is a good way to strengthen the collaboration between the DoD and the Vannevar Bush fellows and transfer the knowledge to the DoD. You may be asked to

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visit the labs. It all depends. These are not requirements, but you must be willing to do some of that, if you are available. Note also that if you are not selected, you may also get the opportunity to get funded by separate mechanisms, by the DoD services, at least for a smaller amount, just to test your ideas.

Slide 19: In closing, I remind you of the critical dates as listed in the FOA. White papers are due August 28th. [*Note Added: An amendment to the FOA has been issued, which sets the deadline for white papers as September 04*]. This is not a huge amount of time so encourage you not to wait until the last minute to submit. We are here to help if you have any questions.

Slide 20: In summary, pictures best describe the program. First, it is about you...you are the PI and the only PI; it is your idea, your creativity we are calling upon. It is also about a challenge. We give you five years to think very carefully about something that is hard, and risky. That means you must be willing to put the time into it. This is not something where you can say: "OK, now I got the award...I'll put some post-Docs onto it and will go do something else or write another proposal". We want you to be absolutely and deeply involved. It is also about exploration...that means that you must set the directions, drive your team. You must lay down the map so others can follow you – you are creating something new. It is also about vision. You must have an idea about where this thing can go. What will the future look like? You must have an idea, if you are successful, of what the impact will be.