

The Defense Science Study Group: Another Way to Help the Nation

Skip Garibaldi and Mark Taylor

Readers of the *Notices* are likely familiar with the AMS-CBMS-AAAS Congressional Fellowship program, which places mathematics faculty to work in the legislative branch for a year. But that is just one way that US mathematicians can give back to their country. We're here to tell you about another one, the Defense Science Study Group (DSSG). One of us, Mark, is in charge of the program and the other, Skip, participated in it during his earlier career as a math professor. The goal of DSSG is to introduce outstanding science and engineering faculty to US national security challenges and to encourage them to apply their talents to these issues. It is divided up into cohorts, which meet for about 20 days per year over two years, broken up into short trips, and scheduled to be approximately compatible with a regular academic calendar. A trip typically involves members visiting military bases, national laboratories, Congress, intelligence agencies, or other parts of the US government. During these visits, members meet with a wide range of people, focusing on top-level officials while also including talking with less-senior folks like privates.

On all of these visits, the DSSG members are joined by a group of mentors, who are mostly retired from distinguished careers in the military or government. They are a rich source of knowledge and wisdom and are regularly cited by former members as a treasured part of the program.

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Figure 1. A common activity during DSSG trips: members learning unvarnished information about the positives and challenges of military equipment from the people whose job it is to use it.

The first few cohorts of DSSG, starting in the mid-1980s, included mathematicians. But over the last two decades, there have been few mathematicians in the pool of nominees. One of our aims with this article is to encourage more mathematicians to apply to be in the program.

Why you might want to participate. There is so much to get out of DSSG. Most members talk about their time with the mentors and with their fellow members, who are other outstanding faculty at a similar career stage. And most people come away with an appreciation for, if not awe of, the breadth and depth of Department of Defense operations and the dedication of the Department's personnel. (One member commented: "I was uniformly impressed with the military personnel I met. There was a sense of competence, dedication, and professionalism conveyed by almost everyone we met" [Spafford].)

For some members, DSSG has a strong effect on their careers. It is exciting to be presented with interesting scientific problems you have never seen before that come with a built-in audience of people who are very interested in their solution. Some members change the direction of their research to focus more on these problems. Members are better able to advise their students on finding jobs in national security. Some members (including one of us) choose to leave academia for jobs in government or national security as a result of their experience with DSSG.

You might be wondering how you could contribute to solving national security problems. In our experience, there is a lot you can do, even if your current research focus may not be directly applicable. First, as a mathematician you bring analytic skills and can break down a problem, even when you are not an expert on the narrow subject. Second, you can read dense technical papers to get up to speed on a topic. Amazingly, “there are lots of places where one person, with the right ideas, can make a huge impact” [Spafford].

It’s good for the nation. DSSG is sponsored by the Defense Advanced Research Projects Agency (DARPA), which is part of the Department of Defense (DoD). This sponsorship exists because technological advantage is fundamental to our nation’s security, and maintaining this advantage requires strong links between emerging scientific leaders and the national security community. This is not an isolated view. In our experience, the DoD hungers for learned and impartial scientific advice and insight. For example, when the Navy plans to renovate a port, they have strong incentives to get accurate forecasts for sea levels decades from now.

One concrete way DSSG contributes is that the members, either individually or in small groups, write “think pieces” on national security issues of their choice. These allow members to focus on a particular area of importance to the DoD, to bring their knowledge from an academic environment to bear on issues of concern, and to interact with individuals in the DoD with related interests. Examples of topics have included protecting soldiers from traumatic brain injury, oxygen recycling processes for submarines, new chemical synthesis techniques for energetic materials, and a process to treat conventional wet suits that improves survival times of Navy divers in frigid waters by a factor of three.

Another way DSSG contributes is that after completing the program, members are much more familiar with the DoD thanks to the visits, interactions with the mentors, and their work on their think pieces. Consequently, they are better prepared to serve on other advisory boards. DSSG graduates have served in over 300 different government-related science advisory roles or leadership positions.



Figure 2. Fighter jet landing on USS Carl Vinson during a DSSG visit, in the Pacific Ocean off California.

A few nuts and bolts. DSSG is administered by the Institute for Defense Analyses (IDA), a nonprofit corporation headquartered in Alexandria, Virginia. Participating in DSSG requires a security clearance, and all members must be US citizens. More information about the program can be found at <https://dssg.ida.org>.

How to participate. Every two years, IDA solicits nominations from senior leaders at universities, often a president or a provost. Contacting your provost might be a good way to start. Selection for DSSG is based on academic excellence, breadth of interests, references, consideration of discipline, and geographic distribution. For information on the next nomination cycle, contact Mark Taylor at mtaylor@ida.org.

Further Reading

- [1] Eugene Spafford, *Spaf’s Government Service & DSSG Experience*, <https://spaf.cerias.purdue.edu/dssg.html>.
- [2] Skip Garibaldi, *Finding your reward*, Notices of the AMS (2020), 57–58, <https://www.ams.org/journals/notices/202001/rnoti-p57.pdf>.
- [3] DSSG website: <https://dssg.ida.org>.



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Credits

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