

USNA Trident Scholar Program Background

The Naval Academy instituted the Trident Scholar Program in 1963 to provide an exciting opportunity for some of their most capable students to engage in extended independent study and research throughout their senior year. Under the Trident Scholar program, midshipmen in the top 10% of their class at the end of the first semester of their junior year are invited to submit research project proposals for evaluation by a committee composed of senior-level professors and officers who represent all academic departments. Based on their academic qualifications and the findings of this Trident Scholar committee, the Academic Dean and Provost appoints new Trident Scholars for the next academic year.

Each midshipman selected to participate in the Trident Scholar program is afforded an unusually exciting and unique educational experience. A Trident Scholar's research is carried out independently, but is also under the close watch of faculty advisers who are all well qualified in the subject field of study. Each Scholar's academic class load is adjusted to allow for the significant time that they will spend on their research project, while at the same time allowing them to complete the requirements of their regular academic major. Special funding provided by the Office of Naval Research (ONR) for the Trident Scholar program helps to make certain that materials, instrumentation, and travel opportunities are available to each scholar. ONR's generous help ensures that each student's experience is as educationally complete and as rewarding as possible.

Traditionally, at the end of each academic year, each Trident Scholar presents the results of his or her research in a lecture at an Academy conference, in a written archived report, and in a poster session prior to a formal dinner. The conference and dinner bring together the entire spectrum of Naval Academy research, including graduating as well as newly designated scholars, their advisers and sponsors, members of the Trident committee and other invited guests. From the work presented by the scholars each year, one is selected as the most outstanding research project. This midshipman is awarded the Office of Naval Intelligence Harry E. Ward Trident Scholar Prize.

Many Trident Scholars are given the opportunity to undertake immediate graduate studies at other universities prior to reporting to their first duty assignment. Many also complete advanced degrees during their time on active duty and return later in their careers for teaching assignments at the Naval Academy.

- Thank you Andy [Phillips, Academic Dean and Provost] for that kind introduction – and for inviting me to be part of this truly special evening.
- It is a real honor and a pleasure to witness the outstanding work done by the 2011 Trident Scholars, and to help the 2012 Scholars kick off what's sure to be an exciting year.
- As a parent of four, I know firsthand how programs like this can shape future careers.

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- The Trident Scholars Program has an impressive history...
- Almost 400 Scholars have participated in the Program in its 48-year history.
- Countless Scholars have presented their research results at local, regional and national meetings of their discipline.
- Several are co-authors with their faculty mentors on presentations, journal articles and patents.
- Many Scholars have been awarded graduate scholarships to such prestigious places as Cambridge and Stanford Universities.
- Over 30 Scholars have reached the rank of Captain, and at least 11 have reached the rank of Admiral.
- Past Trident Scholars have gone on to become the former Vice Chief of Naval Operations, Commander of STRATCOM, and the Chief of Naval Research.
- I have had the honor of experiencing firsthand the quality of this Program. After CAPT Dan Dixon graduated from the Trident Program in 1983, and before he worked in my office, he served as both the TOPGUN and Strike Department Heads at the Air Warfare Center (Fallon, NV) and was also Deputy Commander and Air Wing Commander of Carrier Air Wing Eight.
- So, you see, you have a lot to live up to!

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- Tonight, we recognize the accomplishments of extraordinary students who have demonstrated exceptional skill and insight and who have worked tirelessly on their projects.
- These students exemplify the very best and brightest.

- We are here to recognize the hard work that goes into programs like this and to congratulate each one of you on your efforts.
- And I applaud the commitment and time of your parents and your faculty advisers.
[recognize them]

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- I'm interested in the ideas you've created. In fact, many of your 2011 projects directly address big problems facing the Department –
 - Directed Energy Beam Jitter Mitigation Using the Line-of-Sight Reference Frame: Jitter mitigation is one of the toughest physics challenges that faces Directed Energy targeting and the Airborne Laser Testbed.
 - Subspace Arrangement Codes and Cryptosystems: Encoding and decoding data while detecting and correcting errors is essential to the Department's ability to ensure the safety of our networks.
 - Sinkhole Avoidance Routing in Wireless Sensor Networks: Wireless sensor networks could become a vital method of increasing our warfighters' battlefield awareness, but not unless we are able to increase their data integrity and reliability.
- The 2012 projects are equally exciting –
 - Fabrication of Graphene Nano-electronic Components Using Thermochemical Nanolithography: Advanced materials development, as well as nanomaterials development, is having an important impact on physics now. As I'm sure you know, two researchers from the University of Manchester won a Nobel Prize in Physics in 2010 for their work with graphene.
 - Measurement of YP Ship Air Wake Impact on an Unmanned Aerial Vehicle: The ability to manage the challenges facing unmanned systems is critical to effectively integrating them into the force. The autonomy challenge, which this research helped mitigate, is so important to the future of the Department that the Secretary of Defense recently listed it among 7 priorities for future investment.
 - Investigation into the Utility of Design and Fabrication of a Reciprocating Piston Engine Crankcase with Advance Composite Materials: This project aligns with one of the Department's biggest focuses – energy – and also attempts to address the problem of engine quieting. Additionally, the ability to manipulate the composition of the combustion chamber would allow us to tailor performance based on acoustics, vibration, and temperature.
- Your projects, and many DoD programs, aim to solve the biggest challenges our military faces.
- Creating and identifying high-tech capabilities to address these challenges is part of my job.
- Within the Department of Defense, we are driving ideas that will open entire new

careers...

- Large Displacement UUV: Develop fully autonomous long endurance land-launched UUVs capable of operating near shore, extending and multiplying the current Navy platform's capability.
- Electromagnetic Railgun INP: EMRG is a revolutionary long range gun with multi-mission potential including ballistic and cruise missile defense, long range land attack, and anti-surface warfare against small boats and ships.
- And of course myriad ideas in other areas including cyber warfare, energy conservation, medical technology, transportation, systems engineering, and protection for our warfighters.
- In fact, the Department has begun to identify and invest in emerging research opportunities...

High Interest Basic Science Areas

- Synthetic biology
 - Engineered design and transport of energy / information in new materials
 - The 2nd Quantum revolution
 - Computational modeling of human behavior
 - Cognitive neuroscience
 - Nano-science and nano-engineering
- The goal is to shape the Department's science and technology investments to open options that counter (and create) strategic surprise.

Department S&T Priorities

- Data-to-Decisions
 - Autonomy
 - Engineered Resilient Systems
 - Cyber Science and Technology
 - Human Systems
 - Counter Weapons of Mass Destruction
 - Electronic Warfare / Electronic Protection
- Developing these capabilities requires people who are excited about science, technology, engineering and math. People like you, the graduating Scholars of this program, and people like you, the future Scholars of this program.
 - Finding and supporting students like you who show so much potential is a real joy for me

personally.

- You represent the kind of talent that our nation needs to ensure that the United States continues to lead the world in innovative new technologies.
- It has been a real pleasure to meet you today; I congratulate you on your accomplishments and your future successes.
- As you continue your careers, you will have the opportunity to not only serve the Navy and your country as military leaders, you will also have the opportunity to shape critical technology areas and help us solve some of our biggest security challenges.
- I'd encourage you to continue to pursue a career in science and engineering and be part of this future.