

# Naval Surface Warfare Center Carderock Division (NSWCCD) CAC Project

## Project Summary

The state-of-the-art of measurement facilities of ARL coupled with a record of more than ten years of externally funded theoretical research in the areas of antennas, microwaves and electromagnetics by the ECE department's faculty at Villanova has created an educational and research environment that is unique in Delaware Valley and conducive in bringing government and industry together for collaboration on joint projects. In fact, right after the completion of the ARL's antenna anechoic chamber facility in the summer of 2000, the Naval Sea Systems Command, NSWCCD-Philadelphia, contacted Villanova with possible collaboration with regard to its antenna research and development needs for the US Navy. The combination of ARL's proven record of analysis and design capabilities, now greatly enhanced with its new anechoic chamber, and the NSWCCD's engineering staff, with more than 20 years of experience in commercial and military antenna measurements, was indeed a recipe for success. This Academic/government relationship allows Villanova's ARL to offer extensive facilities and expertise to government and industry for the research, development, integration, evaluation and testing of RCS and antenna components and systems.

Since September 2000, the Center has collaborated with NSWCCD in writing several joint proposals to federal agencies as well as to industry. In particular, we put together a team of Villanova faculty, graduate students, and the NSWCCD engineers to write two successful proposals to the Boeing Corporation in Philadelphia. These proposals were funded in September 2001, and April 2002, respectively. In these projects, Boeing's interest is in a full analysis and measurement of antenna communication systems on the V22 aircraft. This research not only requires electromagnetic simulation of the whole aircraft, but also calls for building a scale model of a V22 in order to experimentally characterize its antennas, in terms of pattern, gain and polarization, in the presence of the fuselage and the rotating propellers. According to the Boeing's personnel, these projects would have been more likely contracted to other facilities, out of the State of Pennsylvania, if such unique combination of electromagnetics modeling and analysis experience (Villanova), measurement capabilities (Villanova) and experienced antenna and Military communications engineers (NSWCCD) had not existed locally in the Delaware Valley region.

The NSWCCD is an important partner in the NSF Partnership for Innovation project "Partnership for Broadband Wireless Innovations, Development and Commercialization". It is also a partner on seven ongoing projects funded by the Office of Naval Research (ONR) on Autonomous Vehicles.

NSWCCD Web Site  
<http://www.dt.navy.mil/>