

## US electric warships to operate by 2012.

Electronic-packaging researchers are to help the US Navy to develop a next generation all-electric warship. The electric warship's system architecture to be designed by Cemal Basaran, director of the Electronic Packaging Laboratory in the University at Buffalo School of Engineering and Applied Sciences.

With other researchers, Basaran is working on the project that will make electric power generated by the ship's power plants and mechanical propulsion system available throughout the entire ship.

Standard shipboard electrical systems are currently unable to distribute this immense electrical power to all parts of the ship, making impractical the use of advanced weapons and sensors that require a lot of power.

Increased power availability will lead to computerisation of most of the electric warship's operations, reducing manpower. The electric warship will require a crew of 100, in contrast to traditional numbers in the thousands.

Under a \$500,000 Navy grant, Basaran, will design next-generation power electronics capable of carrying high-current density and high-power to all parts of the warship, using nano and microelectronics technology, a critical component of the ship's system architecture.

Basaran and co-researchers work, already used by companies such as Intel, has helped produce smaller, faster and longer-lasting electronic devices at much lower cost. They have developed advanced computer models to simulate and predict electronic packaging fatigue life and reliability under extremely harsh service conditions.

"Our job is to design and test for the Navy micro- and nanoscale, electronic packages that maintain reliability under extremely harsh conditions resulting concurrently from acting vibrations, high-current density, high-power and high-temperature loads," says Basaran.

The warship's integrated electric system will reduce significantly size and electrical power consumption. By shrinking the size of a ship's power components, the Navy will free up onboard space for other functions.



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