Image: Synthetic Dialectic, Adam Donovan. A previous science/artwork by the DSTO artist-in-residence, exhibited at the Metro Arts Centre, Brisbane. The device is a mounted array of audio macroscopic scatterers that focus impinging soundwaves to a field at the rear of the array.

SOUND LIKES A GOOD IDEA... ART AND DEFENCE SCIENCE

Adam Donovan is at the forefront of developing new and innovative methods of incorporating applied physics into artistic work. A sculpture graduate of the Queensland College of Art, Griffith University (1994), his work has been exhibited at the Queensland Art Gallery, the Institute of Modern Art and the Pratt Institute (New York). Adam is currently developing public artworks for the new River Walk Project (commissioned by the Brisbane City Council

Adam's artist-in-residency at DSTO Edinburgh (SA) is one of a series of science residences, hosted by various organisations, called Deep Immersion: Scientific Serendipity. The scheme facilitates the marriage of art, science and technology and has proved fertile ground for artistic and scientific collaboration. The Deep Immersion series was begun by the Australian Network of Art and New Technology (ANAT) in 1999 with funding assistance from the Department of Industry, Science & Resources.

The Maritime Operations Division (MOD) of DSTO is facilitating Adam's art/technology research by sharing its expertise and knowledge in acoustics. Here he has conducted research into the development of parametric acoustic arrays. These 'acoustic lenses' focus highly directional ultrasound, which is demodulated by its passage through air to produce audible sounds that can only be heard within a narrow 3-degree beam over a range of some 200 metres. DSTO is one of the few research organisations in Australia to work extensively with ultrasound as part of its sonar technology research.

"This is the best science lab I have worked in," says Adam. "I wish I could be a permanent artist in residence at DSTO, moving about from lab to lab."

At Edinburgh Adam has set up a small lab and has access to scientists and equipment. He pays

particular tribute to the stimulation and advice he has received from MOD researchers such as Dr Henry Lew, Binh Nguyen and Joe Cashel. Adam says that thanks to these people his design has completely changed since his arrival at DSTO. “I came with a concept and about ten articles on parametric acoustic array lensing effects. Now I have a complete idea of the problem and the range of technical solutions available to me.”

“Adam’s concept of sound projection from multiple sources and spatial sensitivity to listeners is novel,” says Dr D. (Nanda) Nandagopal, Chief, Maritime Operations Division. “This kind of artist-scientist fusion of ideas stimulates innovation and certainly has useful spin-offs for us. I favour such activities because they encourage defence scientists to think ‘outside of the box’.”

The artwork that has been the focus of Adam’s time at DSTO is to be exhibited in ‘conVerge: where art and science meet; the 2002 Biennial Exhibition of Australian Art’ - part of the forthcoming Adelaide Festival program. It will include two acoustic lenses linked to a robotic tracking system to follow viewers of the exhibition and create an interactive installation of acoustic and visual projections.

Adam says that he has been using an art/science approach since around 1993. His earlier work was with optical lensing and he has now moved into acoustics. Initially his audio work used parabolics to achieve lensing effects but these were nowhere near as effective or exciting as the parametric acoustic devices he is now working with.

“This is possibly the biggest development in loudspeaker design in 75 years,” says Adam. “Its history goes back to 1934 when the parametric effect was first discovered but only in the last ten years has the technology become available that makes its application possible. Acoustic lenses have tremendous potential in virtual reality environments but there is still no parametric acoustic array commercially available anywhere in the world.”