

## TWIPS -- sonar inspired by dolphins

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Scientists at the University of Southampton have developed a new kind of underwater sonar device that can detect objects through bubble clouds that would effectively blind standard sonar. Just as ultrasound is used in medical imaging, conventional sonar sees with sound. It uses differences between emitted sound pulses and their echoes to detect and identify targets. These include submerged structures such as reefs and wrecks, and objects, including submarines and fish shoals. However, standard sonar does not cope well with bubble clouds resulting from breaking waves or other causes, which scatter sound and clutter the sonar image. Professor Timothy Leighton of the University of Southampton's Institute of Sound and Vibration Research (ISVR), who led the research, explained: "Cold War sonar was developed mainly for use in deep water where bubbles are not much of a problem, but many of today's applications involve shallow waters. Better detection and classification of targets in bubbly waters are key goals of shal

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*"To catch prey, some dolphins make bubble nets in which the best man-made sonar would not work. It occurred to me that either dolphins were blinding their sonar when making such nets, or else they have a better sonar system. There were no recordings of the type of sonar that dolphins use in bubble nets, so instead of producing a bio-inspired sonar by copying dolphin signals, I sat down and worked out what pulse I would use if I were a dolphin," said Leighton.*

*"TWIPS outperformed standard sonar in the wake of large vessels such as passenger ferries," said co-author Dr Justin Dix of the University of Southampton's School of Ocean and Earth Science (SOES) based at the National Oceanography Centre, Southampton.*

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Scientists have developed a new kind of underwater sonar device that can detect objects through bubble clouds that would effectively blind standard sonar.

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