

Lego pirate proves, survives, super rogue wave

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The pirate prepares for the oncoming super rogue wave.

(PhysOrg.com) -- Scientists have used a Lego pirate floating in a fish tank to demonstrate for the first time that so-called ‘super rogue waves’ can come from nowhere in apparently calm seas and engulf ships.

The research team, led by Professor Nail Akhmediev of the Research School of Physics and Engineering at ANU, working with colleagues from Hamburg University of Technology and the University of Turin have been conducting experiments in nonlinear dynamics, to try and explain so-called rogue or killer waves. These high-impact ‘monsters of the deep’, can appear in otherwise tranquil oceans causing danger, and even sinking ships.

Using a scientific fish tank, a wave generator and a Lego man on a ship floating on the water surface, the scientists were able to demonstrate that [rogue waves](#) much bigger than previously thought can occur. The team have labelled these ‘super rogue waves’, as they can be up to five times bigger than the other waves around them. A video of the experiment can be seen [here](#):

“This observation could have far-reaching consequences for our efforts to understand these waves that are, by far, still mysterious,” said Dr. Akmediev.

“The large amplification of the rogue wave peak above the normal waves around it suggests the existence of a new class of waves – the so-called ‘super rogue waves’. Our results show that, even in a sea characterised by small waves, rogue waves can naturally develop due to the nonlinear dynamics of the surface elevation.

“This is an extraordinary fact that could explain some mysterious observations of rogue waves in calm sea states.”

Rogue waves have only recently been accepted as science fact, rather than fishermen’s tales of the deep sea. Despite decades of debate among scientists, a prototype of how a rogue wave could develop – called the Peregrine soliton – was only very recently observed experimentally in fibre optics.

This study, published in *Physical Review*, shows that the theory is crucial in understanding the development of super rogue waves that could develop in the deep oceans of the world.

“Of course, in real oceans the problem will require more careful analysis, but we expect the result to have a significant impact on the studies of extreme ocean waves and more generally, extreme events in

nature and society.”

The [Lego](#) pirate survived unharmed. However, nature is rarely so benign. In the last month several events have shown that monstrous waves appear more often than expected.

Provided by Australian National University

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