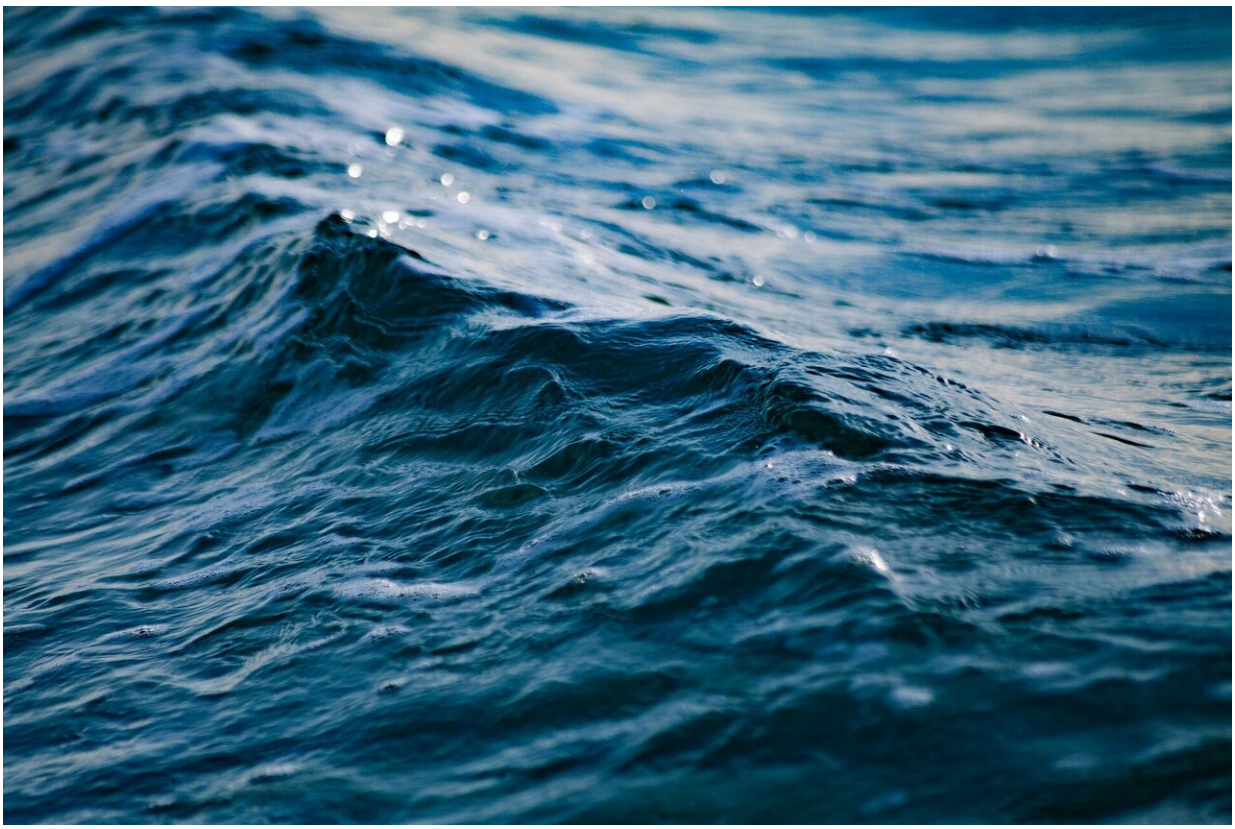
Best of Last Week–Accuracy of two-qubit calculations, energy from seawater and health benefits of glucosamine supplement

May 20 2019, by Bob Yirka



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It was another good week for physics research as a partnership between the National Institute of Standards and Technology and the University of

Maryland, shed new light on the atomic wave function using laser light and other optics—it yielded a new way to obtain the essential details that describe an isolated quantum system. Also, a team at the University of New South Wales revealed the accuracy of two-qubit calculations in silicon—a quantum world first. And the group of researchers working on the SENSEI collaboration presented new direct-detection constraints on Sub-GeV dark matter using a new prototype detector. The finding will enable searches for dark matter interactions with electrons at unprecedented levels.

In technology news, an international group of researchers demonstrated a type of energy-free superfast computing using light pulses. And a team with members from several institutions in China announced that they had created a power generator that autonomously switches between two functional modes—a system that allows for the direct electrochemical extraction of energy from seawater. Another team with members from institutions in Switzerland, the U.K. and Spain announced that they had developed a way to carry out holographic imaging of electromagnetic fields using electron-light quantum interference.

In other news, the team working on China's Chang'E 4 mission discovered new "secrets" from the far side of the moon by studying data sent back regarding new information about the largest crater in the solar system. Also, a team at the University of Sydney found that the common food additive E171 affects the gut microbiota—the common whitening agent was found to interact with bacteria in the gut and impair some of its functions, which may result in the development of diseases. And a team at the University of Maryland suggested that hyperdimensional computing theory could change the way AI works by helping robots remember things in new ways.

And finally, if you are one of the millions of people around the world who takes supplements hoping they will improve your health, you might

want to check out the results of a study led by Professor Lu Qi at Tulane University—the researchers found glucosamine supplements may be linked to a lower risk of cardiovascular disease.