

HotSpot Episode 32: Quadcopter that Acts Like a Guide Dog

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This week on WDD's HotSpot, brought to you by SanDisk:

- Fiber optics is important for making communication faster than ever, but the next step involves a quantum leap -- literally. [UC Santa Barbara scientists](#) [1] are working on how to translate electrical quantum states to optical quantum states in a way that would enable ultrafast, quantum-encrypted communications. The paper, published in Nature Physics, describes a nanomechanical transducer that provides strong and coherent coupling between microwave signals and optical photons. In other words, the transducer is an effective conduit for translating electrical signals (microwaves) into light (photons). According to the authors, their prototype transducer is fully compatible with superconducting quantum circuits and is well suited for cryogenic operation. They believe that superconducting quantum devices will enable a new generation of on-chip quantum devices with unique capabilities.
- Researchers at the [Stanford School of Engineering](#) [2] have created the first theoretical framework that includes semiconductors made from plastics or, more accurately polymers, which bend and stretch readily enough, seeking to understand, predict and improve the conductivity of semiconducting polymers. The observed tendency of polymeric semiconductors to conduct electricity at differing rates in different parts of the material turns out to depend on whether the polymer strands are coiled up like a bowl of spaghetti or run relatively true, even if curved, like lanes on a highway. It seems the entangled structure that allows plastics and other polymers to bend also impedes their ability to conduct electricity, whereas the regular structure that makes silicon semiconductors such great electrical switches tends to make it a bad fit for our back pockets.
- [MIT has built a flying robot](#) [3] to help guide people through complex environments, and aid in search-and-rescue missions. [The SkyCall Quadcopter](#) [4] acts like an electronic flying guide dog, hovering just ahead of the user and guiding them to their destination. During a test mission users called for a SkyCall via a customized mobile app. The vehicle arrived in front of the user and awaited instructions of where to go. User then type in a simple code to tell the drone where they wish to go. Traveling at walking speed and hovering around two meters in front of the user, the drone provides information about locations it passes by "speaking" to the user via their smartphone.
- [University of Adelaide](#) [5] researchers have found a way to provide plastic bags with a useful purpose after they've been thrown away by developing a process that turns them into a high-tech nanomaterial. The 'carbon

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nanotube membranes' are highly sophisticated and expensive materials with a variety of potential advanced applications including filtration, sensing, energy storage and a range of biomedical innovations. According to the Adelaide researchers, the process is catalyst and solvent free, which means the plastic waste can be used without generating poisonous compounds.

For more information visit <http://www.sandisk.com/> [6]

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Links:

[1] http://www.eurekalert.org/pub_releases/2013-09/uoc--urm092313.php

[2] http://www.eurekalert.org/pub_releases/2013-09/ssoe-ssp092313.php

[3] <http://www.dezeen.com/2013/09/13/skycall-quadcopter-by-mit-senseable-city-lab/>

[4] <http://shanhe.scripts.mit.edu/skycall/index.html>

[5] <http://www.adelaide.edu.au/news/news65022.html>

[6] <http://www.sandisk.com/>