

Mobile phones come alive with the sound of music, thanks to nanogenerators

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Credit: Peter Griffin/Public Domain

Charging mobile phones with sound, like chants from a football ground, could become a reality, according to a new collaboration between scientists from Queen Mary University of London and Nokia.

Last year, Dr Joe Briscoe and Dr Steve Dunn from QMUL's School of Engineering and Materials Science found that playing pop and rock

music improves the performance of solar cells, in research published with Imperial College London.

Developing this research further, Nokia worked with the QMUL team to create an energy-harvesting prototype (a nanogenerator) that could be used to charge a mobile phone using everyday background noise – such as traffic, music, and our own voices.

The team used the key properties of zinc oxide, a material that when squashed or stretched creates a voltage by converting energy from motion into electrical energy, in the form of [nanorods](#).

The nanorods can be coated onto various surfaces in different locations making the energy harvesting quite versatile. When this surface is squashed or stretched, the nanorods then generate a [high voltage](#).

The nanorods respond to vibration and movement created by everyday sound, such as our voices. Electrical contacts on both sides of the rods are then used to harvest the voltage to charge a phone.

In order to make it possible to produce these nanogenerators at scale, the scientists found innovative ways to cut costs in the production process.

Firstly, they developed a process whereby they could spray on the nanorod chemicals – almost like nanorod graffiti – to cover a plastic sheet in a layer of [zinc oxide](#). When put into a mixture of chemicals and heated to just 90°C, the nanorods grew all over the surface of the sheet.

Secondly, gold is traditionally used as an electrical contact but the team were able to produce a method of using cheap and cheerful aluminium foil instead.

The ultimate device was the same size as a Nokia Lumina 925 and

generates five volts, which is enough to charge a phone.

Could plugging your phone into the mains socket be a thing of past?

Dr Joe Briscoe commented: "Being able to keep mobile devices working for longer, or do away with batteries completely by tapping into the stray energy that is all around us is an exciting concept. This collaboration was an excellent opportunity to develop alternative device designs using cheap and scalable methods. We hope that we have brought this technology closer to viability."

More information: [conversations.nokia.com/2014/0 ... s-alive-sound-music/](https://conversations.nokia.com/2014/08/12/mobile-phones-come-alive-with-the-sound-of-music/)

Provided by Queen Mary, University of London

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