

THE PLATTSMOUTH AMATEUR RADIO CLUB

Communicator

November 2018

Spray-On Antennas Could Be the Wave of the Future

(ARRL 10/02/2018) Researchers at Drexel University's College of Engineering report a breakthrough in nanomaterials technology that promises to make installing an antenna as easy as applying sunblock or bug spray. The University reported the research in a DrexelNOW article, "Drexel's Spray-On Antennas Could Be the Tech Connector of the Future." The advance could mean wearable and invisible antennas that could find their place in the next generation of the Internet of things (IoT), and even have Amateur Radio applications.

"The ability to spray an antenna on a flexible substrate or make it optically transparent means that we could have a lot of new places to set up networks," said Drexel Wireless Systems Laboratory Director and engineering professor Kapil Dandekar, a co-author of the research published recently in Science Advances.

"This technology could enable the truly seamless integration of antennas with everyday objects which will be critical for the emerging Internet of things," Dandekar said.

In their paper, Dandekar and his colleagues laid out a method for spraying invisibly thin antennas made from a type of two-dimensional metallic material called MXene — a conductive, two-dimensional titanium carbide material — which can be dissolved in water to create an ink or paint. They said the exceptional conductivity of the material enables it to be employed as an RF radiator even when applied in a very thin, nearly invisible coating. The MXene antennas perform as well as those now being used in mobile devices, wireless routers, and other devices, the Drexel researchers said. In addition, the MXene materials were shown to be 50 times better than graphene and 300 times better than silver ink antennas in terms of preserving the quality of RF transmission.

"Current fabrication methods of metals cannot make antennas thin enough and applicable to any surface, in spite of decades of research and development to improve the performance of metal antennas," said Yury Gogotsi, director of the A.J. Drexel Nanomaterials Institute, who initiated and led the project PhD. "We were looking for two-dimensional nanomaterials, which have sheet thickness about 100,000 times thinner than a human hair; just a few atoms across, and can self-assemble into conductive films upon deposition on any surface. Therefore, we selected MXene as a candidate for ultra-thin antennas."

"The MXene antenna not only outperformed the macro and micro world of metal antennas, we went beyond the perform-

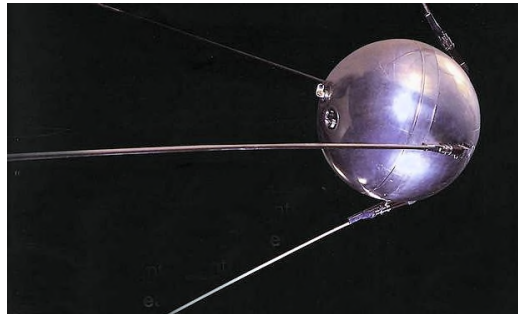
ance of available nanomaterial antennas, while keeping the antenna thickness very low," said Babak Anasori, a research assistant professor in the A.J. Drexel Nanomaterials Institute. "The thinnest antenna was as thin as 62 nanometers — about a thousand times thinner than a sheet of paper — and it was almost transparent."

Unlike existing nanomaterial fabrication methods that require several steps, the Drexel research team's spray-on antennas can be fabricated in a single step by airbrush spraying a water-based MXene ink, Anasori said.

<http://www.arrrl.org/news/spray-on-antennas-could-be-the-wave-of-the-future-university-researchers-believe>

<https://drexel.edu/now/archive/2018/September/MXene-spray-antennas/>

<http://advances.sciencemag.org/content/4/9/eaau0920>



Sputnik 1 Launched October 4, 1957

(ARRL 10/04/2018) October 4 marked the 61st anniversary of the launch by the Soviet Union of Sputnik 1, Earth's first artificial satellite. The Soviets heralded the launch as a national triumph, and the space race between the USSR and the US began.

Sputnik 1 was a 58-centimeter diameter, polished aluminum sphere sprouting four antennas and transmitting a 1 W signal on 20.005 and 40.002 MHz, putting it within the range of nearly any radio amateur. Orbiting the planet about once every 96 minutes, Sputnik 1 could be seen from Earth. Following the launch, the US National Institute of Standards and Technology's HF radio station WWV even halted its nighttime 20 MHz transmissions to avoid interfering with the satellite's signal.

Scientists studying it gained information about such things as the density of the upper atmosphere, deduced from orbital drag. The propagation of its signals also helped to better understand the ionosphere. The US launched its first artificial Earth satellite, Explorer 1, on January 31, 1958.

www.arrrl.org/news/remembering-the-launch-of-sputnik-1-earth-s-first-artificial-satellite

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**Charter Members #New Ham*

Note: Thanks to all who have paid their dues and many who have given additional donations. All donations are greatly appreciated. Please let me know of any corrections.

Meetings are 8am the last Saturday of most months at Mom's Café in Plattsmouth.

Tuesday night get-togethers at Plattsmouth Burger King at 7 PM



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The September 29, 2018 meeting was held at Mom's Café in Plattsmouth. The meeting was called to order at 8:10 am by President Roger Behrns.

Those in attendance were Roger (KBØOGO), John (KCØHYD), Shirley (KCØHYE), Dave(WØZY), Bill (KEØXQ) Dudley(KDØNMD), Derek (WØDBW), Gary (KBØKYT), John (WR5I), Chuck (AIØN), Fred (KBØLF), and Keith (KAØIJY).

The Minutes of the August meeting were approved on a motion by Chuck and second by Bill.

The treasurer reported no expenses and receipts of \$20 for dues. This leaves \$285 in the repeater fund and \$690.35 in the general fund for a balance of \$975.35. Keith moved and Gary seconded a motion to accept the treasurer's report. Passed.

It was decided to hold the Annual Dinner as we have been at Famous Dave's on the last Sunday of January at 5 pm. Shirley will check on the reservations.

Dudley updated us on the Scout Jubilee to be held at Mahoney Park on October 12-14 and encouraged everyone to try to work the scouts.

JOTA will be October 20 and they will be working from the Scout Shop on 120th and Maple. Try for them on 12 & 17 meters.

The meeting adjourned on a motion by Dave and second by Gary at 8:18.

Meeting Calendar
8am, October 27, 2018
8am, November 24
at Mom's Café
No meeting in December
Annual Dinner Sunday 1/27/19

PLATTSMOUTH ARC MEMBERSHIP REGISTRATION FORM					
Name		Call Sign		Class	
Address		City	State	Zip	
E-Mail			Phone #		
Spouse Name			Call Sign		Class
Membership Type	<ul style="list-style-type: none"> ● Additional donations are gratefully accepted. ● New Hams are free during the year they receive their first license. ● Please give this form and dues to the club treasurer or any club officer. 		Donation for:	Amount:	
<input type="checkbox"/> Primary(\$15) <input type="checkbox"/> Spouse (\$5) <input type="checkbox"/> Student (\$5) <input type="checkbox"/> New Ham			<input type="checkbox"/> Repeater fund <input type="checkbox"/> Insurance <input type="checkbox"/> Other _____ <input type="checkbox"/> General	<input type="checkbox"/> I prefer my donation to be anonymous.	
Any additional e-mail or cell phone #s?					