

Researchers invent 'remote magnetic gears'—safe wireless vehicle-charging technology

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The new UBC wireless charging system works in all weather conditions. Credit: UBC

University of British Columbia researchers have invented a safe, efficient technology to wirelessly charge electric vehicles using "remote

magnetic gears" – and successfully tested it on campus service vehicles.

"Wireless charging has been a much sought-after technical solution for everything from cell phones to [electric cars](#)," says UBC Physics Prof. Lorne Whitehead. "A significant concern for charging cars wirelessly has been the high power and high frequency [electromagnetic fields](#) and their unknown, potential [health effects](#) on humans."

Prof. Whitehead and his team invented a completely different method operating at a frequency 100 times lower and with negligible exposed electric fields. Their solution uses "remote magnetic gears" – a rotating base magnet driven by electricity from the grid, and a second located within the car – to eliminate the use of radio waves. The base gear remotely spins the in-car gear, which in turns generates power to charge the battery.

Four wireless charging stations have been installed at UBC's Building Operations parking lot and service vehicles retrofitted with the new technology. Tests show the system is more than 90 per cent efficient compared to a cable charge. A full charge takes four hours and enables the vehicle to run throughout an eight-hour shift.

"One of the major challenges of [electric vehicles](#) is the need to connect cords and sockets in often cramped conditions and in bad weather," says David Woodson, Managing Director of UBC Building Operations. "Since we began testing the system, the feedback from drivers has been overwhelmingly positive – all they have to do is park the car and the charging begins automatically."

The team originally conceived the magnetically driven [charging system](#) for medical devices such as an implanted [pacemaker](#). The larger system, supported by the NSERC Idea to Innovation Grant, was tested at UBC as part of the Campus as a Living Laboratory initiative and provides

valuable data for further research and development. A patent for the technology has been filed through the University Industry Liaison Office.

More information: www.ubcwirelesscharging.ca/

Provided by University of British Columbia

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