

Dissertation press release

14.05.2020

# Engineering thin material layers in space and time for extreme electromagnetic wave control

<b>Title of the dissertation</b>	Surface-impedance engineering for advanced wave transformations
<b>Contents of the dissertation</b>	Conventional devices for controlling electromagnetic wave, such as mirrors, lenses, gratings, etc., have limited functionalities, efficiency, and, usually, large dimensions. This dissertation shows that ultra-thin material layers engineered in space and/or time can completely substitute the conventional wave-controllers and, moreover, realize arbitrarily defined functionalities. To this goal, the dissertation develops a systematic method for modeling and design of metasurfaces for general application purposes. Based on the developed method, extraordinary wave phenomena which do not exist in nature are demonstrated, e.g., asymmetric mirrors, nonreciprocal wave amplifiers, and multifunctional gratings.
<b>Field of the dissertation</b>	Radio Engineering
<b>Doctoral candidate</b>	Xuchen Wang, M. Sc. (Tech.) Born in Ningbo, China, 1988
<b>Time of the defence</b>	29.05.2020 time 18:00
<b>Place of the defence</b>	The public defense will be held via remote connections. Link to the Zoom event: <a href="https://aalto.zoom.us/j/65114599050">https://aalto.zoom.us/j/65114599050</a>
<b>Opponent</b>	Prof. Juan Sebastián Gómez-Díaz, University of California, Davis, USA
<b>Custos</b>	Prof. Sergei Tretyakov, Aalto University, School of Electrical Engineering, Department of Electronics and Nanoengineering
<b>Electronic dissertation</b>	<a href="http://urn.fi/URN:ISBN:978-952-60-3879-7">http://urn.fi/URN:ISBN:978-952-60-3879-7</a> ( <i>permanent link to dissertation, if dissertation is already available in electronic form</i> ) <a href="https://aaltodoc.aalto.fi/handle/123456789/44180">https://aaltodoc.aalto.fi/handle/123456789/44180</a>
<b>Doctoral candidate's contact information</b>	Xuchen Wang, Department of Electronics and Nanoengineering, <a href="mailto:xuchen.wang@aalto.fi">xuchen.wang@aalto.fi</a> +358503097794